CONTINGENCY PLANNING AND SIMULATION EXERCISES
FOR THE CONTROL OF EPIZOOTICS

Dietrich Rassow
Federal Ministry of Consumer Protection, Food and Agriculture
D - 53123 Bonn, Germany

Summary: Epizootic diseases are a continuous threat to livestock. The most important tools for emergency response are an early detection and warning system, contingency plans and an organisational structure with a single line of command. A questionnaire was distributed to the European OIE Member Countries to assess their current state of preparation with regard to contingency planning and their views and experiences concerning simulation exercises. All 36 countries which returned the questionnaire held the view that any outbreak of a highly contagious disease needs to be addressed by all available government resources. However this is not yet the case in all Member Countries. Contingency plans are available in the majority of countries but not all List A diseases have been covered adequately. Technical points to be improved include increasing efforts to identify holdings quickly, preferably with the help of a geographical information system, and finding better solutions for the safe disposal of carcasses in large-scale operations. Lack of public support for stamping out measures and poor cooperation with animal welfare groups has been a cause of concern and should be addressed by improving communication. Simulation exercises have been staged in 86 % of the countries over the last 4 years. However information on and experiences with such exercises have not been widely shared between countries. The organisation of simulation exercises involving neighbouring countries could enhance international cooperation in this field. In this point the OIE could take a leading role.

1. INTRODUCTION

Epizootics are feared because of their impact and virulence. They not only have the potential to spread rapidly but also to cause significant damage to any livestock industry, irrespective of national borders. The introduction of a highly contagious disease may have serious socio-economic consequences for a region or even a country.

As one of the lessons learnt from one of the largest European epizootics in recent years it has been stated that in spite of all our experience, diseases will remain unpredictable and events may still occur on a scale that no-one can anticipate (1). In order to cope with such critical situations Veterinary Services and all other available resources will have to stretch to the limit if not even further. For example at the height of the foot and mouth disease campaign in the United Kingdom the work of more than 1,800 veterinarians – plus many thousands of support staff – had to be organised and coordinated (2). To have a chance to successfully control a major epizootic Veterinary Services need a profound preparation. The processes by which organisations plan for such extraordinary events are referred to as contingency planning.

The concept of contingency planning for epizootic diseases is nothing new. Since the establishment of Veterinary Services across Europe in the 19th century the control of highly contagious diseases has included putting rudimentary contingency plans into place. Staff instructions and procedures following the confirmation of rinderpest, contagious bovine pleuropneumonia or foot and mouth disease were drafted as early as 1866 in a number of European countries (3). The main drive behind the development of contingency planning at European level in recent times has undoubtedly been the transition from a vaccination policy to a stamping out policy. In particular it was recognized that following the decision taken in the European Union to cease vaccination against foot and mouth disease by the end of 1991 contingency planning to ensure adequate provision for emergency response would be vital (4). Since then outbreaks of the List A diseases classical swine fever, foot and mouth disease and avian influenza in several European countries have put the Veterinary Services as well as their respective contingency plans to a tough trial. One of the many hard lessons learnt in all affected countries was that contingency plans must involve more than just the Veterinary Services (5). Furthermore they must be designed for operations on a larger scale than had been anticipated before (1). Apart from establishing clear lines of management, plans should consider the availability of adequate diagnostic laboratory and carcass disposal capacities. It was also realised, that simulation exercises should test plans to ensure they provide an effective response, can be translated into practice and are suited to train staff in emergency procedures (6).
Effective contingency planning requires more than just the advance preparation of written instructions and operating procedures. It will have to include systems for the identification of animals and holdings as well as for communication and decision-making. Managing large-scale destruction and disposal measures with or without emergency vaccination within the shortest possible time poses a huge logistical challenge (7). At the same time, Veterinary Services will in many countries be subjected to an enormous pressure due to public resistance to the eradication of herds (8).

This is the setting within which the OIE Regional Commission for Europe decided to discuss contingency planning and simulation exercises at the 21st Regional Conference in Avila. It was the aim of this study to assess the current situation regarding contingency planning and simulation exercises. To gather information on this technical item a questionnaire was developed and sent to the 50 Member Countries. The answers were evaluated in order to identify the strong and weak points, to communicate experiences for the benefit of other countries, to point out any need for improvement and to provide recommendations for further work and support within the framework of the OIE.

Questionnaires were returned from: Austria, Azerbaijan, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and the United Kingdom.

2. EVALUATION OF RESPONSES

A set of 21 questions was developed, consisting of six main parts: the livestock industry - general structure and risk -, services and staff involved, elements of contingency planning, simulation exercises, a general assessment and finally Member States opinion on the role of the OIE in the field of contingency planning and simulation exercises. From the 50 OIE European Member States 36 responses were received. The following is a synopsis of these responses.

2.1. Livestock industry and perception of risk

To get an overview of livestock production in the different Member Countries, they were first asked to indicate the main features of their livestock industry. As one might have expected the great majority of animals and products from all livestock species will enter local markets in all countries. Between 72% (sheep and goats) and 91% (cattle) of countries gave a clear indication of this. International trade is most prominently observed in poultry (36%), cattle (36%) and pigs (33% of supportive answers). Asked what would be considered potential risks for the introduction of a List A disease 75% of countries gave the movement of infected cattle their top priority followed by movements of infected pigs (64%), small ruminants (61%), poultry (58%), and horses (47%). The overall second highest risk factor were the movement of contaminated products (including swill and catering waste) for pigs (75% of responses) and to a much lesser extent for cattle (50%), poultry (39%) and small ruminants (36%). High density of holdings as well as disease in wildlife reservoirs is considered significant for pigs (58 resp. 61%) and poultry (58% each) only. With the exception of Arboviruses posing a risk to small ruminants (33% of countries) less than 20% of the responding countries regarded inadequate vaccination cover or endemic occurrence as presenting a risk to their livestock population.

Putting the responses to the question on potential risks in relation to the information provided on trade patterns it was noted that countries with a focus on export (25%) considered the movement of animal and products twice as often a potential risk than countries characterised by imports and domestic market production (72%).

2.2. Command structure and other Services

Clear lines of responsibility and good communication are vital to any organisation in crisis. Another critical aspect is the speed with which decisions need to be taken and passed down to those responsible for delivery. At the same time information must be passed on to the stakeholder organisations concerned. 47% of countries presented an organisational or flow chart of their line of command and communication. There is a considerable variation amongst the Member Countries alone in terms of their size and administrative structure such as the level of decentralisation. But looking at the crisis management structures one can find common characteristics. In half the countries (47%), the organisational structure of which was looked into, the command line would start at a ministry or comparable top level authority then go down to a regional authority or comparable agency and end up at a local authority. In general this three-level hierarchy would not be different from peace-time procedures. However three countries reported that in an emergency they would alter command lines by either shortening them, e.g. direct linkage between the CVO and the Minister or even the head of the national government, or by concentrating key functions, e.g establishment of emergency teams or setting up contingency committees. It was noted that four Member Countries which had had a recent history of major epizootic disease, provided a quite comprehensive and detailed explanation of their line of command and communication procedures going as far as having already designated meeting rooms and meeting times in case of an emergency.
Which other than the Veterinary Services would take active part in contingency planning at central level? Six of the 29 countries which responded to this question did not indicate whether there would be any help from outside the Veterinary Services? Where support was available it would most often be provided by the Police (13 x), the Armed Forces (9 x), the Ministries of Interior (9 x), of Health (6 x), of Defence (5 x) and of Civil Emergencies (6 x). Other offices and organisations mentioned included fire rescue brigade, customs, agricultural services, weather bureau, public health agencies, wildlife fund and treasury.

Most Member States have in common that they can make use of a number of expert groups for field diagnostics and epidemiology. With 29 countries answering this question, expert groups would most often be available for classical swine fever in 79 %, for foot and mouth disease in 76%, Newcastle disease and avian influenza 48%, bovine spongiform encephalopathy 45% and swine vesicular disease 17% of the countries. In individual countries expertise can also be provided on other diseases, e.g. Bluetongue (3 countries). Five countries stated that they were able to give expert advice on all diseases of List A. Most commonly experts would have to be called in from a National Central Laboratory.

2.3. Elements of contingency planning

The first question under this heading aimed at establishing whether contingency plans would be available or under preparation and if so for which List A diseases this would apply. Foot and mouth disease is the only disease for which contingency plans are either available or in preparation in all responding Member Countries. A number of plans were then identified as currently not being available and not under preparation for classical swine fever (1 country), Newcastle disease (2 countries), avian influenza (4 countries), bovine spongiform encephalopathy (3 countries), African Swine fever (9 countries), swine vesicular disease (10 countries), Bluetongue (6 countries), African horse sickness (12 countries) and sheep and goat pox (13 countries). Between one and eight countries had prepared plans for further List A diseases. With few exceptions (2 x) Veterinary Services would make their contingency plans electronically available. In fact 42% countries stated that their plans could be accessed on the internet, in some cases protected by password.

Whenever contingency plans are available they appeared to be quite comprehensive. There was a relatively even response that plans which were available would cover legal powers, equipment and staff for crisis centre duties, procedures for sampling, tracing, quarantine, disinfection, evaluation, delineation and movement restrictions. Issues not addressed in the context of contingency plans were identified to be payment of compensation (2 x), emergency funding (3 x), procedures for humane slaughter (2 x), emergency vaccination (3 x) and safe disposal of carcasses (1 x). Guidelines for psychological support of affected families had been included by five Member Countries.

Veterinary Services must act quickly to prevent an outbreak of a highly infectious disease leading to a major scenario. An immediate task would be to identify the location of any herds at risk. Identification and registration of holdings are therefore basic requirements for sound contingency planning. Countries were asked to state the proportion of holdings that had been registered either on paper record, in a PC database or in a geographical information system. 34 Member Countries provided the requested information. A 100% registration of holdings has been achieved for cattle in 83%, for sheep in 67%, for goats in 61%, for pigs in 69%, for poultry in 50% and for horses in 28% of the responding countries. The use of PC databases was reported for holdings of cattle in 59%, of pigs in 47%, of sheep in 41%, goats in 38% and poultry in 24% of the countries. The operation of a geographical information system is under progress in 11 countries. Seven of them reported they had a coverage of at least 70% of cattle and pig holdings in a geographical information system. The secure identification of individual animals is crucial when it comes to tracing the source and spread of an infection. Countries were asked to provide information on the proportion of individual livestock which had been marked by eartag or equivalent. Of the 33 countries answering this question 73% reported 100% marking for cattle, 55% for sheep, 64% for goats, 39% for pigs and 21% for horses.

During a disease emergency one or more local crisis centres (LCC) will serve as the backbone of disease control measures. Ideally LCC would be situated within easy reach of the infected area. Questioned as to whether this could be ensured, countries clearly indicated that - with four exceptions - no relevant holding would not be located further than 40 km (33%) or 80 km (36%) from the next LCC. No local crisis centre would have to deal with more than 50.000 (53%), 150.000 (38%) or 200.000 cattle units (14% responses) within its area of responsibility.
In order to support field operations that require a strict hygiene regime such as sampling, destruction or vaccination measures, it can be useful to establish a special mobile crisis centre. Almost half of the countries were in support (16 yes, 17 no, 3 no answer) of such a unit. Supportive countries commented on the functions they would expect to be performed in mobile field units. Comments received described the primary function of a mobile centre to deal with typical ‘unclean’ LCC duties, in particular handling of samples, coordination/briefing/debriefing of teams for screening, culling, tracing and storage, distribution and disinfection of equipment.

With regard to the common application of stamping-out measures for List A diseases, Veterinary Services need to include fast, safe and humane slaughter methods in their contingency plans. For cloven-hoofed animals the captive bolt method was stated as being most widely used (42-67%), followed by electrical equipment (up to 53%) and lethal injection (up to 58%). Shooting devices played a minor role (5-6 responses) for these species. Horses would most commonly be put down with a lethal injection (53%), with the captive bolt method (31%) and by free bullet (22%). Lethal gas is almost exclusively used for poultry. It was twice mentioned for pigs/piglets. Dislocation of the neck and poisoning of drinking water were added as other killing methods for poultry.

In the course of an epizootic the disposal of carcasses may become quite a critical logistical challenge. Looking at the methods Member Countries reported for the disposal of carcasses rendering (133°C, 3 bar) was given first priority (58-70%) followed by burying (50-56%), burning in a housed furnace (28-33%) and burning outdoors (22-36%). One country uses commercial landfills as an additional method of disposal. 61% of the countries were able to state their weekly capacity for rendering and/or indoor burning. Values ranged from below 500 tonnes per week to between 10,000 and 30,000 tonnes (in one country up to 70,000) per week.

Diagnostic resources are limited and should be carefully addressed in contingency planning. Using foot and mouth disease as an example countries were asked to provide information on their available diagnostic capacity. 29 laboratories (15 having accreditation status) are currently in a position to test for either antigen or antibodies of foot and mouth disease.

2.4. Simulation exercises

During times when disease is absent, staff training and regular updates of emergency procedures are generally best dealt with by the simulation of a disease scenario. As one result for this part of the questionnaire it can be concluded that between 2000 and 2004 simulation exercises have been a regular feature in x % of Member Countries. For each consecutive year 5 to 6 countries reported one, 2 to 7 countries reported up to 10 and 1 to 3 countries conducted more than 10 exercises per year. Simulations had most often been organised as office-based exercises, followed by field and real-time alert exercises (ratio of 4.3:2). They had been staged evenly at national, regional and local level and rarely lasted longer than four days.

Simulation exercises covered fairly evenly most features of disease emergency response. The focus of each exercise was usually placed on the procedures at the different levels of crisis management including communication channels, epidemiological tracing, sampling methods and notification procedures. Testing of readiness, alert time and staff mobilisation were also mentioned as prime targets. Notably less focus was given to the preparation of emergency vaccination (22%), cooperation with the police (20%), evaluation of livestock (17%) and animal destruction and disposal methods (11%).

2.5. General assessment

In order to obtain a general opinion from Member Countries they were first asked to assess the strengths and weaknesses of their contingency plans. For that purpose 18 topics had been listed and answers could range on a scale from very strong to very unsatisfactory. With a response from 34 countries in total, all countries had a largely positive view of their state of contingency planning. In particular command structures, alert times, cooperation between officials in charge, information systems and epidemiological procedures were considered to be strong points without any exception. Unsatisfactory aspects were most prominently seen in the areas of cooperation between neighbouring countries (23%), provisions on vaccine resources (11%), public support for stamping-out measures (14%) and cooperation with animal welfare and environmental groups (33%).
In the second part of this question countries were asked to assess the same topics in the light of their past experience with simulation exercises. Although these opinions would closely correspond with the previous ones there was a slight shift from positive towards neutral responses. Unsatisfactory responses received on cooperation between neighbouring countries, provisions on vaccine resources and public support for stamping-out measures and cooperation with animal welfare and environmental groups were intensified in the light of simulation exercises. Additionally carcass disposal was regarded as an item needing improvement in terms of practical management. (in 14% of the countries unsatisfactory).

2.6. Role of the OIE

In a yes/no format countries were asked whether the OIE could support its Member Countries in the area of contingency planning and simulation exercises. All 36 countries replied with yes. In an attempt to endeavour what kind of support might be useful, countries had the opportunity to decide on four different options. 61% of the countries were in favour of seminars and exchanges of practical experience. More than 80% were in support of raising the awareness of political decision-makers on this issue and encouraged international cooperation in this field. Specifying any relevant provisions of the Terrestrial Animal Health Code found less support (77%). No specified comments were received.

3. DISCUSSION

Animal livestock systems are permanently at risk of infection with epizootic disease. Although domestic market orientation is a common feature, the diversity and high degree of specialisation in production systems mean that animals and animal products are traded across all borders. This trend and the associated risk will continue. Veterinary Services have identified these risks. However countries with a strong export interest seemed to be more aware of trade associated risks than other countries. The ideal attitude in this respect would be to always expect and accordingly prepare for a worst case scenario.

Veterinary Services will have to shoulder the main burden in a disease emergency. The overwhelming majority of countries have recognized that all necessary tasks and functions cannot possibly be borne by a single organisation within a country. Unfortunately this viewpoint has not come into practice everywhere. Countries having gone through the traumatic experience of a major epizootic disease now seem to have the advantage of getting prepared for a new scenario more thoroughly.

Due to economic issues there is a tendency to move animals more often and to keep them according to specialized husbandry systems at different sites during a production cycle. Contingency planning has to take this into account. In particular, there is an increased demand for sophisticated computerised information systems including geographical reference data.

Technical improvements of contingency plans were seen as being foremost necessary on including provisions on emergency funding, resources and organisation of emergency vaccination and on the disposal of carcasses, especially in regions with a high livestock density.

The lack of public support and the poor cooperation with animal welfare and environmental groups is felt to be a considerable concern. It seems likely that a great deal of information about the nature and consequences of epizootic disease still needs to be communicated to the public and the media.

Simulation exercises should include an emergency vaccination scenario whenever appropriate. Police and other important services should be involved in simulation exercises as provided for in contingency plans. Information on and experiences with simulation exercises have not been shared widely between countries. It was felt that such exercises should be staged more often at an international level. This would be an important step towards a trustful cooperation between neighbouring countries.

The information and views expressed in the 36 questionnaires may be a good foundation for further discussion and Member countries preparation in order to prevent or at least minimize hardships caused by epizootic disease.
REFERENCES


