

## **9 CONTINGENCY PLANNING**

### **9.1 Purpose**

This Section supports Section 10 of the *Technical Guidelines*. It provides details on the procedures required to support participating countries in establishing contingency planning, and provides some preliminary guidelines for the development of contingency plans, at both the national and farm levels. At the national level, this section is based largely on experience in the livestock sector, and requires further refinement to develop an effective system for aquatic animals. Farm-level contingency planning is based on experience with shrimp aquaculture, where some contingency planning experience exists.

### **9.2 Background**

Advance planning to deal with serious disease outbreaks can significantly reduce the social and economic impacts of disease. In addition, prompt action, based on a solid contingency plan, can effectively reduce the potential spread of disease agents. Using fire as an analogy, economic losses will be smaller if the fire is detected quickly and fire-fighters arrive at the site promptly with the resources necessary to stop the fire. The speed of their arrival depends on the efficiency of the reporting system, speed of response and availability of fire fighting equipment. The efficiency of the fire-fighting team depends on their training and experience under different conditions. A similar scenario can be applied to reduction of economic and stock losses caused by disease. To minimize such losses, it is necessary to have good surveillance, accurate disease diagnosis, efficient reporting systems and well-trained specialists who know how to deal with different disease emergencies. Although the needs are the same for government/institutional levels and at the farm level, the extent and manner of action may differ between the two.

The failure to eliminate a new disease in a country is often due to failure to mount a rapid and effective disease containment and eradication campaign, rather than a lack of scientific knowledge, e.g.:

- ineffective disease surveillance and reporting systems – including denial and /or secrecy;
- lack of adequate diagnostic services;
- inadequate reporting structure;
- inexperienced or insufficiently trained manpower;
- lack of an emergency work plan;
- ineffective legal support to execute an eradication campaign, including compensation for stock destruction;
- lack of funds/equipment/supplies; and
- lack of public support and cooperation.

A contingency plan is a documented plan of action to ensure that:

- as many likely scenarios as possible have been considered;
- requirements to deal with these have been defined;
- adequate resources are available in case of disease emergencies; and
- the resources can be deployed promptly and efficiently.

Although they may differ in detail, all contingency plans contain three major elements: background information, disease outbreak scenarios and response actions.

#### ***Background Information***

Specific background information is vital to make reasonable, well-informed decisions about how to contain and deal with a disease. Such information should include:

- a shortlist of diseases of major concern, with all available information on modes of transmission, prevention and control procedures;
- a full description of the various farm systems susceptible to the diseases of concern;

- names and phone numbers of individuals and government agencies who can help with disease control efforts;
- descriptions of physical, chemical and biological techniques that can be used to contain or deal with disease
- lists of available local resources, locations and contact people;
- lists of resources available nationally, within region, or in other countries;
- sources of finance for disease control measures/activities; and
- description of the communication system that will be used to co-ordinate personnel and agencies involved in the control effort.

### ***Disease outbreak scenarios***

It is impossible to know when a new disease is going to appear or how much of an impact it is likely to have on aquatic resources. Although generic disease outbreak contingency plans can be developed, diseases with established etiological information are more predictable and, thus, more easily circumvented or avoided. Some disease outbreaks are small and/or localized, and are easily controlled. Others may be large, spread rapidly and be difficult to manage. Disease outbreaks are influenced by different factors, including weather, geographic isolation and transmission dynamics. All affect the ability of personnel to respond to, contain and tackle a disease outbreak. Private companies, along with local, state and central government agencies, should be included in, or design their own, contingency plans to reflect the range of possible scenarios. These can be determined from the following information:

- disease(s) known to occur (frequently/infrequently) within an area, or of particular concern;
- conditions which predispose the aquatic animals to disease;
- proximity to other farms and areas where the disease may occur; and
- extreme weather conditions that might occur in the area at different times of year.

Contingency plans are designed to prepare for the kind of disease outbreak that is "most likely" to occur at a particular place/facility. On rare occasions, however, a new disease occurs, or the impact of a disease is greater than expected. To prepare for these unusual, but significant incidents, contingency plans must also include "worst-case" scenarios, such as, for example, a highly infectious disease that spreads rapidly and causes heavy mortalities.

One difficulty with "new" disease situations (not necessarily "worst-case") is defining the problem i.e., at which point is it serious enough to warrant an emergency reaction? Diagnosis may be of limited value as a decision-making tool, since the origin (and cause) of the problem may be unknown during the initial outbreak. While samples should be sent for analysis to obtain pathology information, the time required for laboratory processing might be too long to assist a farmer with acute/severe mortalities, particularly where the pathology analysis requires identification of a new pathogen and its modes of transmission. However, definitive disease diagnosis is not always necessary for decisions to be made on "interim" control measures. Many diseases have been described on the basis of their gross pathology (e.g., YHD and WSSV of shrimp) or characteristic features (e.g., EUSof fresh- and brackishwater fishes). These descriptions allow farmers or extension staff to make a presumptive diagnosis with a clear, consistent case definition and a decision or recommendation for disease control measures. Laboratory results reinforce or refute presumptive diagnosis, increase the level of diagnostic certainty and permit refinement of effective control strategies. The development of a good working case definition should allow the identification of the specific disease or condition using facilities or techniques that are most commonly available to the outbreak investigators at the site of the outbreak. This may include diagnostic tests, but can also include observational criteria. Although the criteria used should clearly separate the specific disease, it is not generally necessary to do so to the highest level of certainty. For severe outbreaks with a high potential for rapid spread, it is often necessary to adopt a cautious approach and make decisions based on available, rather than ideal, information.

## **Response actions**

A carefully designed contingency plan will describe major actions to be undertaken when a disease occurs. To optimize the efficacy and minimize spread of a disease, these actions should take place immediately following detection/reporting of the outbreak. Response actions include:

- notifying all staff, individuals, private companies and government agencies that are responsible for the disease control effort, as well as those likely to be affected by the disease or the control measures taken;
- getting trained personnel to the site quickly;
- determining the extent of the disease, its nature, speed of transmission, and likelihood of spread to neighboring farms, sites or environment;
- stopping continued entry of the disease agent onto a site or into a population, where possible;
- confining the outbreak to a limited area;
- eradicating the disease, where possible (usually only possible in land-based facilities or discrete ponds - there are few cases of successful eradication of a disease agent from open-water populations);
- rapid removal of moribund or dead animals from the water and sterile or land-fill disposal; and
- follow-up surveillance/monitoring after the disease outbreak is brought under control.

## **9.3 Government/Institutional-Level Contingency Plans**

Contingency plans at the governmental and institutional level are required to deal with outbreaks that threaten regional environments, aquaculture sectors or national disease status (e.g., emergence of an OIE-listed pathogen considered exotic to national waters). Where no legislation is present, the process relies on voluntary compliance. In such cases, location of financial resources to fund the emergency response efforts, as well as effective and rapid communication, are major elements determining success.

Contingency planning for aquaculture is relatively new compared to other culture systems, however, some approaches based on terrestrial livestock can be applied. The following example describes various elements that could comprise a national level “task-force” approach. It is a comprehensive overview, and many countries may not have (or require) all the organizational levels described. It should also be noted that the issue of compensation for stocks that are destroyed in order to control disease spread is likely to be a major consideration, especially with high value or investment produce or for wide-scale disease containment (“disasters”). The decision to establish a compensation mechanism for farmers whose stock is destroyed as a means of disease control, and the setting of levels of compensation, should generally be the responsibility of national policy and legislative bodies.

### **Personnel**

The task force approach requires the formation of flexible, multidisciplinary teams of specialists, seconded from their normal duties, who are mobilized under the specific conditions identified as constituting a disease emergency. The terms and conditions of such secondment should be clearly set out and agreed by the participating organizations in advance.

A formal organization structure should be established at a level appropriate to the problem. This may be either local or national, depending on the scale of the anticipated problem. The highest level of administration would be a national committee (in the case of a national disease contingency plan) or a local committee (for smaller scale planning) vested with the authority to act and take decisions to implement the emergency response plan. This committee is responsible for administration of the response to a disease problem and the co-ordination of resources (including funding) in support of the emergency task force(s). The committee should consist of key decision-makers in agencies or authorities with

responsibility or jurisdiction in areas likely to be involved in the emergency response. Depending upon the scale of the contingency plan, this may include representatives of ministries and organizations responsible for fisheries, animal health, finance, trade, transportation and law, local governments, aquaculture/fish producers associations, trade unions and the emergency task force (ETF) office. In general, the chairmanship of such a committee should rest with the head of the nationally recognized Competent Authority or his/her designated appointee, although in some cases it may be appropriate to appoint another person. The decision to implement the emergency response should be the responsibility of the CA, although the request for such a decision could be made by another concerned party.

Depending on the circumstances, one or more levels of control team may be established:

- a national emergency committee (NEC);
- a local emergency committee (LEC); and
- emergency task forces (ETF) - a team, or teams, of disease experts, with field operations and administrative staff.

These people are generally assigned on a case-by-case basis from their normal responsibilities on short-term or part-time basis. However, for the duration of the emergency they would be assigned to the team and answerable to the team leaders for their activities within the plan.

The NEC should consist of, at minimum, representatives for the Competent Authority, government authorities with relevant jurisdiction/responsibility, industry/trade association and ETF heads. Relevant specialists may be assigned to the committee on an *ad hoc* basis as required. If external funding is required, representatives of the funding agency should be included in the NEC. At the local level, a Local Emergency Committee (LEC) would have a similar composition, including representatives of the local government administration. The responsibility of the ETF, which will be located at the scene of the emergency, is to implement the plan and decisions of the NEC/LEC, and assist them in day-to-day decisions required for the Emergency Program.<sup>5</sup> The ETF must disseminate information as it is acquired in order to maintain credibility as the main source of reliable, unbiased information.

Task forces are by definition transient and *ad hoc* bodies established to deal with a specific task, and usually bring together a multi-disciplinary team from several organizations/agencies on a part-time or short-term secondment basis. Their existence is not permanent but ends once the specific task is completed. An Emergency Task Force (ETF) to deal with a disease situation should include at least:<sup>6</sup>

- a Director (with authority and responsibility for the conduct of the task force and its objectives);
- a Field Coordinator (responsible for day to day supervision of the effort in the field);
- an Administration Coordinator (responsible for administrative and logistical support of the ETF);
- a Laboratory Coordinator (responsible for specialist laboratory support and quality of services provided to the ETF);
- Aquatic animal producers' representatives; and
- an Information/Communications Officer.

Other task force members may be required for implementation of the Emergency Program, depending on the scale of the problem or response being considered. These may include police/fishery protection officers to assist in compliance with the elements of the emergency response plan, customs officials (where trans-boundary shipment issues are likely to arise) and administrators of the compensation program (where one exists). Additional technical support specialists may also be appointed to the committee on an *ad hoc* or permanent basis.

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<sup>5</sup> For less serious disease problems using a task force approach, this body may act as both an NEC and ETF

<sup>6</sup> In some cases, two or more functions may be fulfilled by the same person.

Training of personnel identified as members of the ETF should be organized on a regular basis to ensure that changes in personnel and likely disease scenarios do not render the contingency plan obsolete and that the elements of the plan are re-considered and fully understood by all members of the ETF.

### **Other Considerations**

#### **Emergency information systems**

Fast dissemination of information is critical for effective control of a disease emergency. Depending upon the type and extent of the disease, this may involve liaison with other countries and agencies, including:

- speedy information network (from the field to the central office);
- informing neighboring countries; and
- informing international authorities.

#### **Diagnostic services**

Rapid and reliable diagnostic services at an appropriate level of diagnostic capability must be confirmed by CA or their designated reference laboratories in order to enact national or local emergency controls. It is generally not appropriate to activate emergency responses as a result of a level I diagnosis, except where the disease can be reasonably suspected to be of significant concern or is a new finding with obvious contagious spread potential. Where possible, the initial findings should be confirmed by Level II or III diagnosis as quickly as possible.

#### **Legal powers**

Ideally, the activities of an ETF should be reinforced by legal provisions (e.g., quarantine, eradication, decontamination, vaccination, compensation, closure of markets etc.). Where this is not present, members of the NEC should raise public awareness and encourage voluntary cooperation for the measures to be taken.

#### **Financial provisions**

Contingency funds for emergency action, their sources and conditions for disbursement should be identified prior to the occurrence of disease emergencies. The funds should be available when a national emergency is declared. This will require the allocation of specific contingency funds, and procedures for their disbursement.

#### **Equipment and supplies**

Equipment and supplies such as vehicles, computers, mobile diagnostic laboratories, disinfection apparatus, mobile telephones, vaccines, disposable overalls etc., should be identified. Arrangements should be made in advance to ensure that they are available for disease emergencies.

#### **Manuals (contingency plans)**

Manuals that contain instructions for all members of an ETF should be prepared and available in advance of a disease emergency. These should also be revised as soon as new disease information and diagnostic techniques become available.

#### **Training**

Regular training courses, or simulation exercises, should be organized for members of the ETF, for field staff responsible for control of aquatic animal diseases and for farmers involved in disease situations.

#### **Public education**

Materials needed for public education, such as video tapes, films, leaflets and color slides, should be prepared, in advance where possible, or as rapidly as possible following collection of data and results, in order to provide accurate information to the public and awareness of emergency activities. It is useful to have a communications officer who is experienced in dealing with the media, and to identify appropriate information channels, since this will

alleviate pressure on, and questioning of, field and diagnostic personnel who are actively involved in tackling the disease emergency.

#### **Action plan**

An action plan should contain instructions that cover all aspects of control procedures, from recording details surrounding the onset of a disease to the final phase of its eradication/suppression. Such a plan can be based on experiences with disease occurrences elsewhere within the country, or through simulation exercises.

### **9.4 Farm-Level Contingency Planning**

At the farm level, complexity (but not necessarily efficacy) of a contingency plan depends upon the size and scale of the operation. Small farms can usually manage with basic plans (gross surveillance/monitoring) due to a straightforward organizational structure (owner/operated, owner/manager, owner/technician) where everyone has clear roles and responsibilities and communication access. Large farms have more complex division of responsibility, and thus need more detailed contingency plans. The ability of farms and organizations to cooperate in these schemes depends upon the awareness of the importance (long-term and short-term benefits) of such planning operation. Cooperation is best served by assignment of responsibility to members from all parts of the organization, or representatives from the farms or organizations involved.

The development of a contingency plan at the farm level consists of several distinct steps:

- risk assessment/hazard identification;
- assessment of existing capability;
- development of the contingency plan;
- testing of the contingency plan; and
- evaluation and modification of the contingency plan.

#### **Risk assessment/hazard identification**

A risk assessment should be conducted to determine the disease events and environmental conditions that could adversely affect a farm, a site or the surrounding environment. This includes assessing the controls needed to prevent or minimize possible effects. Cost-benefit analyses to justify investment in control should also be considered. Examples of risk assessment considerations include:

- potential disease risks to the farm or surrounding environment;
- outside expertise required and available to assist in a disease emergency;
- vulnerabilities (neighboring activities, climatic factors etc.);
- risk reduction possibilities;
- acceptable risk levels; and
- existence/availability of appropriate response procedures and contingency plans

Procedures for risk analysis are outlined in Section 10, "Import Risk Analysis." Farmer attitudes to disease risks vary, but generally, diseases with high loss potential and a moderate or high risk of exposure should be considered as a priority in contingency planning. It is important to remember that for *all* risk analyses, the outcome is rarely fully predictable. This is especially relevant for aquatic diseases where we have relatively little knowledge about life-cycles, reservoir carriers, environmental survival and ability to detect sub-clinical infections. This makes the process highly subjective – a fact that has to be acknowledged and addressed in the risk analyses. Effort is best directed toward diseases of moderate to high risk and for which there is sufficient information to develop effective mitigative or contingency plans. For diseases of high risk (e.g., the pathogen is exotic and has caused significant losses elsewhere), where there is a lack of accurate epidemiological information, mitigative or contingency planning involves "guesswork." In such cases, the risk is "unacceptable."

Once a list of significant diseases has been developed (see Annexes V and VI), all available information on these diseases, both published and anecdotal, should be collated. The

information should be regularly evaluated and updated, recognizing that any anecdotal information may need to be corroborated to ensure it is reliable and consistent with published information. Reliable information sources should be identified and kept up to date.

### ***Assessment of existing capability***

Existing procedures should be evaluated to determine whether or not they are adequate in the light of new knowledge or the occurrence of previously unknown disease problems. Contingency planning is an ongoing process requiring regular re-assessment as new information is obtained, or when people with particular roles and responsibilities leave or their job functions change.

The assessment should cover all aspects of the farming system. Some examples of vulnerable areas are:

- use of wild larvae/seed/fry versus hatchery-reared;
- in-house larval production vs. externally produced;
- quality of larvae/seed/fry available (handling and broodstock histories);
- use of fresh feed or trash fish vs. commercially produced feeds;
- water supply quality and treatment;
- water exchange capability; and
- lack of available resources capable of controlling a disease outbreak vs. presence of strong health support resources.

Methods of reducing the risk of disease exposure through these routes can then be identified and evaluated. The impact of the environment should also be considered. Many diseases have distinct seasonal dynamics that need to be taken into account, since the extent of an outbreak and the capability to deal with it may be influenced by seasonal factors, such as rainfall and flooding.

### ***Cost-benefits***

If the risk and financial loss associated with a particular disease is perceived to be high, high-cost mitigating measures may be acceptable. In addition, if perceived benefits outweigh potential impacts, the cost of mitigative measures may be acceptable. The scale of the operation or potential environmental impact may also be a major factor in determining cost-effectiveness of mitigative or control programs.

Acceptable risk levels vary between farmers. Some farmers accept a high degree of risk, especially where potential returns are high, whereas other farmers are more cautious and prefer to accept lower levels of return for greater consistency or certainty of production. On a small farm, this conflict is unlikely to occur. As farms get larger, however, the degree of risk acceptable to different employees or managers becomes a problem in the development of a contingency plan. Acceptable levels of risk must, therefore, be agreed upon at the risk assessment phase, rather than during the course of an outbreak. It must also be noted that risk assessment for aquatic animal production rarely affects only individual production facilities/sites. Confluent waters and the productivity they support must also be taken into account ("good neighbor risk assessment"). Thus, it is important that neighboring farms cooperate in their risk assessments and the development of their contingency plans.

## **9.5 Contingency Plan Development**

Farm site contingency plans should identify likely disease outbreak scenarios and determine strategies to deal with them. Farm contingency plans should:

- identify available strategies, their effectiveness, advantages, disadvantages and cost;
- identify off-site requirements;
- identify information requirements;
- identify on-site resource requirements;
- establish clear decision-making criteria;

- establish clear job descriptions and responsibilities;
- develop emergency procedures where none exist; and
- develop a communications process for managing an outbreak.

At the farm level, contingency plans will generally consist of two components, one of which is general and one which will be specific to the farm site. General components of a contingency plan will be details common to any farm or site experiencing the same problem, e.g., the kind of information to be collected, how it should be analyzed, and sources of external assistance. Examples of farm-specific components would be the on-site resource requirements, criteria for activating the contingency plan, and control activities based on water/stock susceptibility(ies).

### ***Identification of disease control strategies***

The first step is to analyze the impact of disease outbreak scenarios identified in the risk evaluation, as these will determine the range of control options. Where possible, specific control plans should be developed in consultation with people who have experience with similar situations.

It is possible to plan non-disease-specific control strategies. These can include:

- establishing links to health support resources and determining optimum sampling procedures that will expedite delivery to diagnostic laboratories and turn-around time for results;
- stocking disinfection supplies; and
- ensuring that individual production tanks, sites, pens, cages can be isolated from the rest of the farm/site.

Disease-specific preventative measures can also be undertaken, such as controlling access to the farm or site by potential carriers of infectious agents (e.g., other crustaceans or aquatic animals, stocks from unscreened/certified sources, etc.), storm- or flood-damage controls, minimizing handling, maximizing water exchange, ensuring regular cleaning of pipes, tanks, nets and other equipment/clothing.

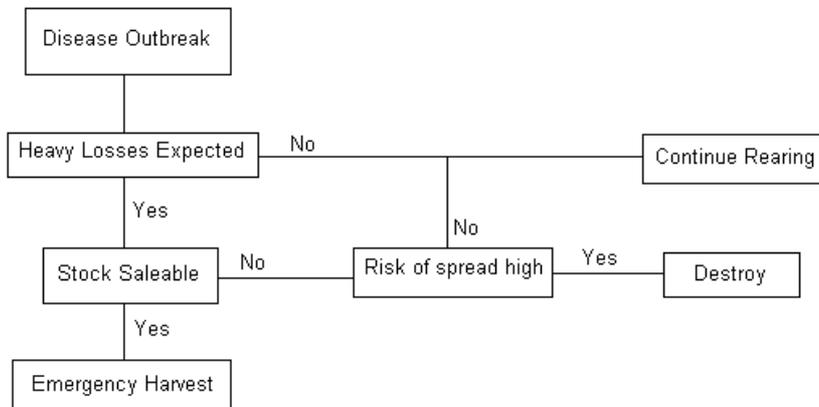
### ***Identification of viable and cost-effective strategies***

It is likely that a range of strategies will be identified. Although these can be prioritized, it is useful to develop several alternatives to maintain flexibility. These strategies can be consolidated into a master plan, which may consist of a “decision tree” (Figure 9.1). Important factors to consider are the existing capability to carry out the strategy and the additional capability and funds required. The cost of implementation should be considered in light of the assessed risk and potential losses.

### ***Identification of information requirements***

Record keeping and, more importantly, the analysis of records are essential components of a disease response contingency plan. Despite this, however, they are frequently neglected, especially in small farm operations, where written records may be basic and used for immediate information needs rather than evaluation and planning. Without adequate records, the assessment of risk is highly subjective, which makes development and evaluation of contingency plans virtually impossible. Even basic records can help the decision-making processes to be more effective. On top of on-site record keeping, it is important to maintain up-to-date information from outside resources. Such information should be shared with neighboring growers who share the same aquatic resources, wherever possible, in order to pool resources. Collaborative contingency planning is especially valuable for small or subsistence-level aquatic animal producers, as well as those operating far from health support resources.

**Figure 9.1.** Simple strategy decision tree for an infectious disease outbreak.



### ***Decision-making and lines of responsibility***

As for national level contingency plans, a key activity for the contingency plan is the identification of clear and unambiguous decision-making criteria and key decision-makers. The criteria may be general, such as shrimp or fish coming to the surface or the presence of moribund or dead animals. Fish or shrimp with clear signs of a particular disease form more specific criteria. If significant diseases share common clinical signs with relatively benign diseases, specific diagnostic procedures may be required. Rapid diagnostic tests or Level I procedures may be an important component of such criteria. General clinical signs or criteria should be verified using pre-established links to on- or off-site specialized expertise.

Key decision-makers must be identified and available. Where responsibility for a farm or site is delegated to a site or production manager, full authority to make decisions must also be clearly delegated, since delays in contacting key decision makers can result in increased losses. It is equally important that everyone on the farm/site understands who is responsible for decisions in the event of a disease outbreak, and what their individual roles are. Contact information should be readily available (posted) and clearly indicate key staff and who coordinates on-site communications. This may be a full-time role or it may be part-time (e.g., as a duty manager). If decision-making staff live off-site, provision for rapid communication should be made (radio, pagers, mobile telephones, etc.).

### ***Communication***

Communication between decision-makers and farm staff in the event of an outbreak and communication between staff are the most obvious requirements. However, two other key areas for communication are often forgotten - communication with staff who are not directly involved in the problem and communication with outside interests. Staff not directly involved usually live locally and are a source of information about the farm to the local community. By keeping them informed and encouraging their participation, it is possible to reduce any conflicts or misinformation that may occur. Communicating information about contingency plans and disease outbreaks to outsiders is also valuable, since external input can often provide new insights and sources of assistance. Keeping knowledge of a disease problem secret is counterproductive and prevents effective control using pooled farm experience and resources. The disease may become established in the aquatic system and/or spread to neighboring sites. This is obviously detrimental to effective control, as well as acquiring neighbor/community assistance, if required.

The need to communicate and coordinate activities with local authorities must also be considered. This is important where statutes and/or regulations exist which directly affect the contingency plan. Close liaison with local government officers and laboratories is often

essential for implementing and coordinating contingency plans. In the case of notifiable diseases, communication with the relevant authorities may be a statutory requirement.

## **9.6 Implementation**

The implementation of even the best contingency plan is likely to reveal unforeseen difficulties. Even detailed plans can be affected by simple problems, such as difficulty in contacting a farm owner or decision maker who is on holiday. The implementation phase may include several activities:

- implementing and testing the plan;
- documenting and evaluating the results;
- reporting results/evaluation to management and the contingency plan team; and
- revising the plan, as necessary.

### ***Documenting the contingency plan***

The draft contingency plan should be written down and reviewed by farm/site workers to ensure it is clearly understood. Such plans should include flow diagrams outlining individual responsibilities and lists of contact numbers in the event of emergencies. This information should be prominently displayed at the farm. Given the high rate of staff turnover in many aquaculture operations, it is essential that procedures are written down, updated regularly and made available to new staff on their arrival. This ensures they know their roles and responsibilities prior to any disease problems.

### ***Testing the contingency plan***

Once the contingency plan is produced, it should be tested by staging a simulated outbreak of disease. This will be more useful (but more difficult) if it is not widely known to be a simulation. If this is not possible, efforts should be made to mimic all details outlined in the plan and honestly assess implementation success. It is useful to involve outside parties, where possible, to provide fresh viewpoints or to act as “devil’s advocates.” This gives the plan as thorough a review for weaknesses as possible. The value of testing of contingency plans should not be underestimated – although inconvenient, the discovery of problems during a disease outbreak is usually much more inconvenient!

### ***Evaluation***

Once the testing is complete, the contingency plan can be revised to incorporate the findings of the simulation. The final plan must be regularly reviewed and changes made to take into account new developments or knowledge discovered during the simulation (e.g., contact numbers of relatives, as well as staff themselves, where necessary). Possible redundancy of parts of the plan must also be considered and implications of their removal assessed. This is an ongoing process requiring the active participation of all employees.

### ***Staff training and awareness***

Training programs to improve awareness of disease risks and the need for contingency plans are essential. Programs to improve communication and coordination between different groups or departments, on-site and off-site, are also useful, since contingency plans may involve staff and resources from several different areas. Specialist training for key staff, such as diagnostic training, record keeping, and evaluation of recorded information, should also be included in training plans.