

Addressing governance in aquatic animal disease emergency management

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Summary

In October 2006 the World Organisation for Animal Health (OIE) held the first Global Conference on Aquatic Animal Health. The conference was arranged as a result of growing awareness of the constraints on managing aquatic animal diseases, due to both knowledge gaps and fragmented governmental responsibilities in many countries. This paper summarises and expands on some of the issues raised at the conference. The issues may be categorised as follows: clarifying roles and responsibilities, building disease surveillance systems and preparing an emergency response, and identifying knowledge gaps and educational needs.

Keywords

Aquaculture production – Aquatic animal disease – Contingency plan – Emerging disease – Knowledge gap.

Introduction

Aquatic animal diseases have been part of the World Organisation for Animal Health (OIE) remit for almost fifty years. In this period aquaculture has grown exponentially to become one of the major animal protein sources globally. New species in aquaculture, new methodologies and often unknown consequences of the interaction between high-density populations and the environment contribute to making this area of production a minefield of emerging diseases, involving both government and industry in prevention and response. Some of these diseases cause serious havoc for production, possibly also threatening wild aquatic populations. There is an expectation that governments and industry intervene to avoid further spread of diseases to regions and areas that have not yet been affected. To this end, in matters of trade in aquatic animals and their products, national regulations must reflect the international standards agreed by the Member Countries and Territories of the OIE, which form the basis for international trade in all animals and animal products.

An increasing awareness of the difficulties faced when handling aquatic animal diseases, which are due to both knowledge gaps and fragmented responsibilities in many

countries, led the OIE to hold the first OIE Global Conference on Aquatic Animal Health in Norway, in October 2006. The conference focused on co-operation among stakeholders in aquatic animal disease management, infrastructure for disease surveillance and emergency response, communication and networking, education and training needs, and there was a separate session on aquatic animal welfare (9).

The conference concluded with a set of recommendations to Member Countries and Territories and to the OIE itself. The recommendations to OIE Members were as follows:

- assure a dialogue among the veterinary authorities, other relevant authorities and the private sector, to identify their respective roles and responsibilities in aquatic animal health management
- establish a regulatory framework for aquatic animal health and strengthen the enforcement of law and the implementation of regulatory procedures
- prepare national aquatic animal health strategies that are capable of dealing with ongoing challenges and are responsive to changing demands
- assure the accuracy and timeliness of international aquatic animal disease reporting

- strengthen veterinary and other tertiary education in aquatic animal health, as well as practical training for farmers.

This review will focus on some of the central issues from the conference in 2006. These are as follows:

- roles and responsibilities
- disease surveillance and emergency response
- knowledge gaps and education.

The paper will also briefly consider the future role of national focal points and Veterinary Services (defined in the OIE *Aquatic Animal Health Code* as 'the Veterinary Administration, all the Veterinary Authorities, and all persons authorised, registered or licensed by the veterinary statutory body' [8]).

Roles and responsibilities

Today, in many Member Countries and Territories of the OIE the organisation of aquatic animal health management is fragmented and responsibility lies with both fishery authorities and traditional veterinary authorities. Production growth often started from the traditional fishery sector, and regulations were initially focused on resource control and trade management. As production has grown over the last 20 years, in some regions exponentially, the management constraints of keeping large biomasses in limited areas, and the market limitations of producing acceptable quality with a limited budget, have led to an explosion of new emerging diseases and syndromes in this field. The market value of production also led to a change in industry profile, from small farmers seeking to strengthen their traditional fishery or agriculture income to large, multi-national conglomerates with complicated ownership structures, encompassing the whole food production chain from farm to market.

New emerging diseases in an intensive management environment led to more involvement of the Veterinary Services. Many Veterinary Services had to build their initial response on techniques based in terrestrial veterinary medicine. In many instances there was little knowledge of the specific techniques involved in treating flock animals in an aquatic environment, and there was also little scientific work done to identify aquatic pathogens, to evaluate the risks they posed, to assess their potential for spread or to establish possible management and control methods. Quick solutions, including the use of traditional antibiotics in large quantities in aquatic environments, with in some instances little positive effect for the animals but major detrimental environmental effects, led to an initial distrust in the Veterinary Services' capability to manage aquatic animal diseases.

A shift in ownership in some sectors of the industry from small farmers to multi-site businesses led to more professional competence in the industry, putting more pressure on veterinarians to provide high quality aquatic animal health services and on research institutions to deliver results with regard to the many knowledge gaps. At the same time, there was a growing appreciation among government services of the need for industry to develop their own quality assurance systems, as part of a more modern approach to production and controls along the whole food chain.

In some countries there is co-operation between the relevant government authorities and institutions, and also between government and industry, although in many countries this co-operation still needs to be further refined to become fully functional. In other countries, co-operation is still very weak, leaving the industry to deal with uncoordinated, or in some instances even conflicting, requirements.

An example of a co-ordinated government approach is the Norwegian system for the licensing of new aquaculture sites. An overarching government policy of one public contact point for stakeholders has been implemented, permitting one application to cover all relevant requirements and a process of co-ordinated case handling which allows for one co-ordinated response. Approval of an aquaculture site in the coastal waters of Norway involves many legal authorities and conflicting public interests. The Directorate of Fisheries, responsible for the allocation and management of aquaculture and fishery resources, is the co-ordinating authority. In addition to consideration of resource allocation and control, the provision of a licence normally requires:

- consideration by the local Municipality of local land and sea use
- consideration by the County Governor of possible detrimental pollution or conflicts of interest with nature conservation and recreational interests
- consideration by the Coastal Administration of ship traffic and harbour controls
- consideration by the Food Safety Authority of the possible adverse consequences of the site on fish health and welfare, the possibility of spreading contagious aquatic diseases and the possibility of contaminating the food chain.

In some cases, the issue of fresh water extraction may also be considered by the Water Resources and Energy Directorate.

The Directorate of Fisheries receives the applications and distributes these to all the services involved. Only after

receiving all statements and sector permits will the co-ordinated response be given to the applicant (3). A flow chart depicting the co-ordinated licensing regime in Norway is given in Figure 1.

With this complex government structure in mind, which is a structure that may be found with local variations in many countries, it is important to recall that it is the producer who is responsible for delivering a safe and high quality product, prepared in accordance with national and international laws and regulations. To manage the risks involved in this production it is essential to operate within a quality-assured system, making use of the most up-to-date scientific knowledge and addressing the balance of issues associated with healthy production, food safety, the environment, yield and economic growth. For large multinational companies operating in many countries, at many sites and with, in many instances, a separate budget supporting scientific research, the adaptation of general and well-known quality assurance systems to their management regime is often part of the company policy. For a small-scale farmer, with little access to scientific risk analysis and few resources to follow a full-scale quality assurance scheme, one has to consider other options.

An example of such an option is the Better Management Practice (BMP) programme that was originally developed in Asia by the Consortium on Shrimp Farming and the Environment, which consists of the Food and Agriculture Organization of the United Nations, the Network of Aquaculture Centres in Asia-Pacific, the United Nations

Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, the World Bank and the World Wildlife Fund (2). The BMP programme is an example of a conversion of full-scale quality assurance systems and principles based on advanced science into practical guidelines that are cost effective and applicable to the small-scale farmer. This programme, with local variations, has been distributed and supported in several Asian countries, helping small-scale shrimp, prawn and carp farmers to manage their production and meet their obligations in a complicated and fragmented legal system, with growing biological pressure on the production systems and an acute need to translate complicated science into everyday practice.

Infrastructure for disease surveillance and emergency response

Building an infrastructure for an adequate emergency response is a central issue for all government authorities. In order to respond adequately when needed it is paramount that all government authorities and stakeholders agree on the policies, strategies, operational procedures and finances in peace-time. Recognising that prevention is better than cure, many national strategies include effective surveillance and monitoring systems as

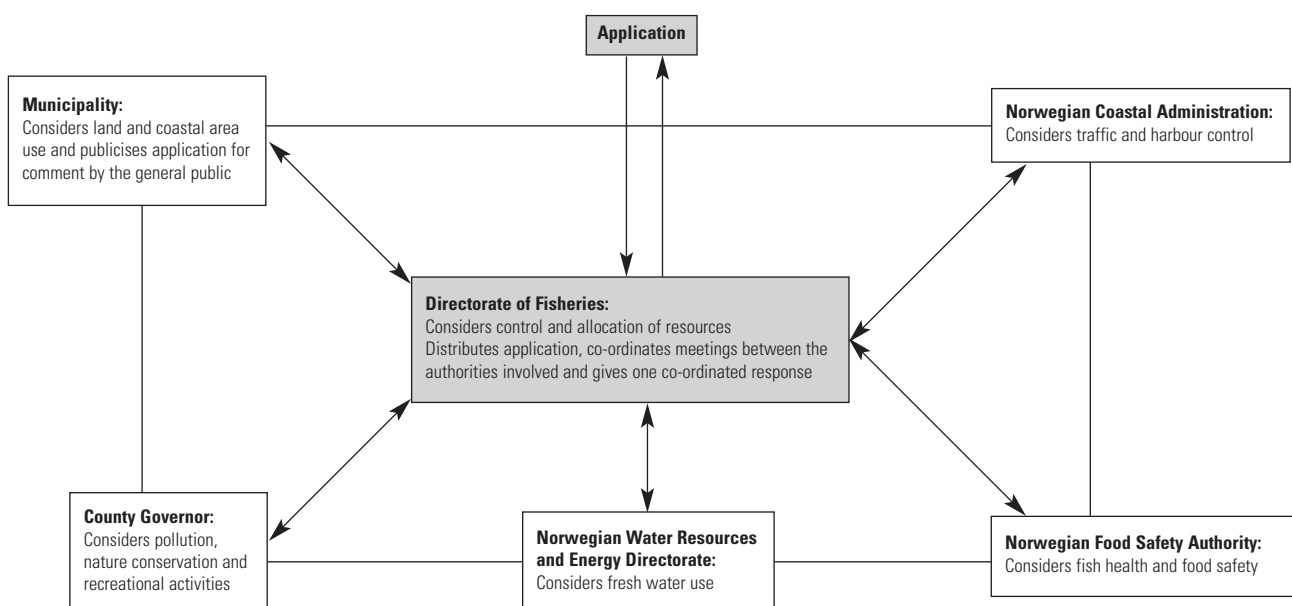


Fig. 1
Flow chart of the aquaculture site licensing regime in Norway: the responsibilities of each authority and the co-ordinating role of the Directorate of Fisheries

part of an integrated infrastructure for control and contingency. The relatively short history of aquaculture as an intensive production system has led to new emerging diseases being discovered routinely. An important element in contingency planning has therefore been to include generic plans that may be used irrespective of the disease agent. Often, however, governments and industry have had to experience the devastation and havoc that a highly contagious disease can cause before they have taken the threat seriously.

In Australia, the mass mortality of pilchards that occurred in 1995 gave birth to the first generation of Australia's National Strategic Plan for Aquatic Animal Health (AQUAPLAN), agreed between industry and government (1). The plan built on an already existing framework and infrastructure for terrestrial animal health. The idea was to maximise the benefits of already existing knowledge and proven tactical and operational choices. The plan has since been updated to address specific priority areas within aquatic animal health. A central element underpinning the plan is that it encompasses all activities related to disease surveillance, monitoring and response, whether they are carried out by central and regional government, industry, research laboratories, diagnostic laboratories, private veterinarians or other aquatic animal health workers. Furthermore, the emergency response, as is the case for terrestrial animal emergencies, builds on support from a general civil contingency structure in the regions. At national level a broad consultation group chaired by the Chief Veterinary Officer is set up and includes industry representatives. The overarching response is supported by more detailed contingency plans and operational and technical manuals that deal specifically with relevant disease agents. All these are agreed with industry in peace-time and refined following focused simulation exercises.

As is clear from the Australian plan, an important element in preparing a response is raising both political and public awareness for the consequences of an uncontrolled disease situation, and gaining agreement in peace-time about acceptable levels of protection, principles for combating disease, roles and responsibilities, and necessary operational capacity. In the past, disease contingency plans often only dealt with one specific disease, were basically operational, and, both in language and detail, only accessible to highly specialised readers. Stakeholders and politicians were prone to accept comments from the 'specialist' as final. This is no longer the case. Therefore, a contingency plan must encompass much more than the disease-specific operational manual. Many countries are now restructuring their plans and setting up tiered plans like the Australian AQUAPLAN.

The strategic plan is the overall policy agreement. This must define the acceptable level of risk for a multitude of relevant disease situations and also prepare for the

unexpected or even the unknown. This strategic plan must be agreed at top level between government, the relevant agencies, industry and politicians. Stakeholder involvement in the broadest sense must be integrated into the plan. The plan must address all possible controversial policies. There are many issues that are no longer just the domain of the 'experts'. Many issues, such as whether or not to slaughter, whether or not to vaccinate, and whether or not to limit transport are all highly political and must be agreed in principle before a full-scale emergency occurs (6). The plan should have a lifespan and be reviewed within that time to assure that new knowledge, new approaches and new agendas are taken into account.

Under this strategic plan a tactical plan should be established that defines roles, responsibilities and the general structure for an emergency response. This structure should not vary in form, but may vary in volume, depending on the emergency situation at hand. A general tactical structure that is accepted across government sectors has the added value that in time of need, personnel may be more easily recruited from other sectors of government. Finally, there should be operational plans that are more disease specific and that assure a coherent and co-ordinated effort from the multitude of professionals involved in the response. The specificity of the operational plan should not exclude it being used also as a more generic operational plan in the case of an emerging or re-emerging disease. A generic operational plan for such situations is many times better than the psychological 'let-down' of the response 'but we don't have a plan'. Prepare the operational plan in a flexible manner. The course of an outbreak is not given, and the operational plan must be adaptable whilst still managing to keep the operation under coherent and efficient control. A report-evaluate-decide-instruct cycle must be robust and operational from the start of the response (6).

Finances are a major strategic issue. The questions of both cost-benefit and cost-sharing take on complicated dimensions in a production sector that includes both small family businesses with limited incomes and international companies registered on the global stock market. At the same time, for most governments, whether the industry is small-scale or big business, it represents an important contribution to the gross national product of the country. Use of traditional insurance coverage has proven weaknesses in a system where the risk of economic ruin and success are only marginally divided. Many countries are now looking at agreements with the industry whereby economic liability is commensurate with the producers' biosecurity plans and risk handling. There are also discussions on co-operative emergency funding, where government and industry together build up a reserve to be able to support affected farms in an emergency situation. For less developed countries, international initiatives to collect funds, such as in connection with the emergence of

highly pathogenic avian influenza H5N1 (HPAI-H5N1), are examples of alternative financial mechanisms to respond to serious disease situations. Although concerted global efforts such as were seen during the HPAI-H5N1 epidemic are rare, it is important to remind global leaders that there are many serious diseases that may, without an appropriate response, spread both regionally and globally, cause socio-economic chaos, present serious animal welfare problems and, in the case of zoonotic agents, constitute a serious threat to public health.

As already pointed out, many countries have recognised that an effective surveillance system, often encompassing more than just the known serious contagious diseases, is a pre-requisite to mounting an effective and timely response. In Norway, a project to co-ordinate all data collection in relation to aquaculture, either by the industry or various government authorities, has been initiated. The project, named MFisk, has the objective of collecting production data, treatment protocols and disease data in a central database where government, research and industry may access the data they need. At the same time, confidentiality between competitors is assured, and unnecessary disclosure of personal information is avoided (7). The objectives are better health and welfare for fish, early warning in respect of emerging or re-emerging diseases, better and more complete data to support research and risk analysis activities, and better data for industry to enable them to define their goals and support the expansion of their production. The combined goals of the project are essential for a good outcome; they cover both government and industry needs, all within a simple framework, and should therefore gain complete support and commitment from all stakeholders.

Knowledge gaps and education

Aquatic animal health is still a relatively young discipline in veterinary medicine. Many veterinary schools barely mention aquatic animal diseases, if at all. Often graduates must apply for further education and extracurricular courses to gain an acceptable level of competence in the field. It is important, however, to be aware that the requirements for the aquaculture industry today are so diverse that a focus on specialisation in aquatic diseases and disease agents alone is probably not the appropriate tactic. The focus must now be on educating general aquatic animal health personnel so that they have a broad knowledge base and understand the production systems in the aquatic environment as well as the interactions that take place within it (5). There is of course also a need to assure diagnostic specialists and epidemiologists, but a holistic approach that includes aquatic animal biology, nutrition, environment and reproduction is advisable. In some countries with a very big and centralised industry

such as Norway and Scotland, veterinary schools have seen the need to co-operate with other educational institutions specialising in educating aquatic animal health personnel to maximize the educational capacity.

There has been a historic knowledge gap in research and diagnostics for aquatic animal diseases. We are therefore in an era where new aquatic diseases are being discovered practically every year. Just thirty years ago only one viral disease of shrimp was described; today nearly thirty are known (4). The parts of the industry that have the capacity to invest in research and development, such as the salmon industry, have in recent years to some extent managed to bridge some of the gaps. But in large parts of the industry, where there is a huge need for more research but so far little concentrated capital, the knowledge gap is still quite deep. A concerted effort is needed to avoid even bigger disasters than some of the industry has experienced so far, and building up research capacity is important for all involved, both industry and government.

Veterinary Services and national focal points

In some countries, Veterinary Services' competence and capacity in animal disease emergency response, including surveillance and monitoring, have brought them to the forefront of the government response to the growth of the aquaculture industry, in an attempt to curb the consequential spread of potentially devastating diseases. However, there are still many other legitimate government priorities in the field of aquaculture production, other than disease control (e.g. resource controls, water reserves, coastal management and sustainable development) which are all traditionally managed and regulated by other government departments. There is therefore not always a clear hands-on approach from the Veterinary Services in contact with the aquaculture industry because areas of responsibility are not clearly defined. An essential task for many Veterinary Services is to become more visible as the competent authority to manage and control aquatic animal diseases. It is also necessary for the Veterinary Services to make governments more aware of their obligation to partake in the international standard-setting procedures within the OIE and to report and disseminate, globally, information on disease management and controls. Many government veterinary authorities are still unsure of their competence in aquatic animal diseases and may therefore keep a low profile on the issue.

Communication and networking are important aspects of disease control. It is often not the technical constraints that are the most difficult to handle, but public relations, communications and information management. To master

these tasks, Veterinary Services must make sure that they have competent advisers. To help Veterinary Services to focus on their tasks as aquatic animal disease competent authorities, the OIE has advised that it may be necessary to appoint national focal points. These may, in some instances, be employed in other government services, but are expected to have substantial contact with, and knowledge of, the aquatic industry. At the same time, these focal points need to become better involved with, and receive more information on, the roles and responsibilities of their government towards international obligations and the OIE. The OIE has been involved in the management of aquatic animal diseases and standard setting for international trade for almost 50 years. The Veterinary Services often have good general knowledge of the OIE standards and guidelines, while other government authorities have little or no knowledge at all of the organisation. The combination of national focal points working in close contact with the OIE Delegate and the Veterinary Services is a promising way to build both better communication and better confidence between the government services involved with aquatic animal diseases and at the same time raise the capability of government services in general to meet their international obligations.

The OIE has in the last couple of years focused on Veterinary Service evaluation and capacity building, and has established and refined an evaluation tool – Performance of Veterinary Services (the ‘PVS tool’) – for assessing the level of Veterinary Service compliance with OIE quality standards. To date, the tool has not focused on

aquatic animal health services, but the intention is to adapt the tool to include them, so that in the future the PVS may be used to help Veterinary Services evaluate their competence and needs in the aquatic animal health field.

Conclusions

Aquatic animal health is a growing concern for Veterinary Services. Aquaculture production has become one of the major sources of animal protein globally, and with this explosion in production there is also an increased need to manage and control aquatic animal diseases. Veterinary Services have traditionally not played a major role in aquaculture production, and must now assert their competence in aquatic animal health management and control, in co-operation with those government authorities that deal with other aquaculture related issues. The focus on the control of aquatic animal disease emergencies must, however, be handled in a strategic manner, gaining full acceptance of all policy decisions from all stakeholders. One of the principal impediments to good control policies is the continued knowledge gap in education and research. OIE Member Countries and Territories are requested to increase their capability to manage and report aquatic animal diseases through the establishment of national focal points. The OIE intends to increase support for its Members in aquatic animal health management through a future revision of the PVS tool to include an evaluation of capacity to deal with aquatic animal health governance. ■

La prise en compte de la gouvernance dans la gestion des urgences sanitaires affectant les animaux aquatiques

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Résumé

En octobre 2006, l'Organisation mondiale de la santé animale (OIE) a tenu la première Conférence mondiale sur la santé des animaux aquatiques. Cette conférence a été organisée pour répondre aux interrogations de plus en plus nombreuses sur les contraintes de la gestion des maladies des animaux aquatiques, lesquelles sont dues, parfois, à un manque de connaissances, mais aussi, dans certains pays, au morcellement des responsabilités gouvernementales. L'auteur résume et développe les questions abordées durant la conférence. Ces questions peuvent être regroupées en trois catégories : la clarification des fonctions et des responsabilités ; la conception de systèmes de surveillance et la préparation des réactions en cas d'urgences ; la détermination des besoins en termes de recherche et de formation.

Mots-clés

Lacune – Maladie des animaux aquatiques – Maladie émergente – Plan d'urgence – Production en aquaculture. ■

Mecanismos de gobierno para hacer frente a las enfermedades de los animales acuáticos

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Resumen

En octubre de 2006 la Organización Mundial de Sanidad Animal (OIE) organizó la primera Conferencia Mundial sobre Sanidad de los Animales Acuáticos, en vista de que había un creciente nivel de conciencia de las dificultades existentes para gestionar las enfermedades de esos animales debido al imperfecto conocimiento que de ellas se tiene y a la fragmentación de las responsabilidades del sector público en muchos países. El autor resume y amplía algunos de los temas abordados en dicha conferencia, que pueden clasificarse como sigue: aclaración de funciones y responsabilidades; creación de sistemas de vigilancia sanitaria y preparación de respuestas para casos de emergencia; y determinación de los conocimientos faltantes y las necesidades en materia de enseñanza.

Palabras clave

Conocimientos faltantes – Enfermedades de los animales acuáticos – Enfermedades emergentes – Planes de contingencia – Producción acuícola.



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