The role of OIE in setting international standards for preventing spread of aquatic animal diseases

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The importance of aquatic animal health continues to increase, not least because of the steady worldwide expansion of aquaculture production (mainly the farming of fish, molluscs and crustacean species) and the fact that infectious diseases continue to impact heavily on aquaculture production in some sectors.
Disease outbreaks due to international trade

Although local pathogens combined with other factors such as poor husbandry and inadequate water quality are the most common causes of disease outbreaks in farmed fish and shellfish, the introduction of ‘exotic’ pathogens through international trade in live aquaculture animals and their products continues to be a major reason for new serious epizootics.
Some examples of international spread of aquatic animal diseases

- First cases of Sleeping Disease of trout in UK linked with imported trout fillets
- EHN virus to Finland from Germany via live farmed sheatfish imports
- First cases of SVC in Switzerland, USA, Denmark linked with koi carp imports from Asia
- Koi herpes virus disease of carp imported into EU Member States and Asia.
Some examples of international spread of aquatic animal diseases

• White spot disease in shrimp has spread to over 20 countries via trade in live shrimp and shrimp product

• Taura syndrome of farmed shrimp spread to Asia from Americas via live shrimp transfers (new species)

• *Gyrodactylus salaris* to Norway from Sweden via live juvenile salmon for stock enhancement

• ISA of salmon from Norway to Scotland (via wellboats ?)
RESPONSES TO SUCH EVENTS?
NOTHING
0
“BAN IMPORTS !!!”

X
REQUIRE QUARANTINE OR HEALTH CERTIFICATION
Quarantine and Health Certification

Quarantine and health certification programmes form a justifiable part of a first line of defence against the introduction or transfer of exotic fish and shellfish diseases

But, they must be developed within the context of larger international standards addressing this problem, because.....
...there are international trade rules to be observed!
WORLD TRADE ORGANISATION (WTO)

“Agreement on the Application of Sanitary and Phytosanitary Measures”
(SPS Agreement)
1995
SANITARY AND PHYTOSANITARY MEASURES: TEXT OF THE AGREEMENT

The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement)

Members,

Reaffirming that no Member should be prevented from adopting or enforcing measures necessary to protect human, animal or plant life or health, subject to the requirement that these measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between Members where the same conditions prevail or a disguised restriction on international trade;

Desiring to improve the human health, animal health and phytosanitary situation in all Members;

Noting that sanitary and phytosanitary measures are often applied on the basis of bilateral agreements or protocols;

Desiring the establishment of a multilateral framework of rules and disciplines to guide the development, adoption and enforcement of

NOTES:

1 In this Agreement, reference to Article XX(b) includes also the chapeau of that Article. (back to text)
2 For the purposes of paragraph 3 of Article 3, there is a scientific justification if, on the basis of an examination and evaluation of available scientific information in conformity with the relevant provisions of this Agreement, a Member determines that the relevant international standards, guidelines or recommendations,
The Sanitary and Phytosanitary (SPS) Agreement states that animal health requirements established by importing countries should be based on international standards, guidelines and recommendations, primarily those developed by the Office International des Epizooties (OIE) - the World Organisation for Animal Health.
However, any country may introduce health conditions for imports of animals and products which provide a higher level of health protection than would be achieved by strict application of the relevant OIE standards, on condition that it can provide scientific justification (usually based upon a full risk assessment).
SPS AGREEMENT

The fundamental principle involved is that health certification should be a means of facilitating international trade and should not be used to restrict it by requiring unjustified health conditions.
The SPS Agreement states that animal health measures that conform to the recommendations of OIE will be presumed to be consistent with the SPS Agreement.

Thus, OIE recommendations should provide the basis for any national animal health regulations with respect to imports of aquatic animals and their products.
So, who/what/where is OIE?
Office International des Epizooties (OIE)

- An intergovernmental veterinary organisation established in 1924 in order to promote world animal health.
- One of its main activities is to provide guidelines and standards for health regulations applicable to international trade in live animals and their products.
- There are currently 174 Member Countries worldwide.
- Now known as the World Organisation of Animal Health
**Alerts - Disease Information**

**30/09/08**  
Update on avian influenza in animals

**02/10/08**  
Animal health news for the week

**Highlights**

**19/08/08**  
23rd Conference of the OIE Regional Commission for Europe

**13/08/08**  
Bird flu strain in Nigeria already known to scientists

**Events - OIE Conferences**

- **Cairo (Egypt)**  
  20-22 October 2008
- **Buenos Aires (Argentina)**  
  17-19 March 2009
- **Asunción, Paraguay**  
  24-28 June 2009
- **Paris (France)**  
  12-14 October 2009

**Editorial from the Director General**

**Fact and mouth**

Improving wildlife surveillance for its protection while protecting us from the diseases it transmits

Wildlife diseases are a growing concern worldwide. In addition to threatening populations of wild animals themselves, wildlife disease can affect domestic animals and human health.

**Online Bulletin**

- Access to the Bulletin

**Focus on...**

- Avian influenza
- Animal welfare
- Food safety
- OIE/World Bank Global Animal Health Initiative
- List of antimicrobials of veterinary importance

**Media Resources**

- Access media resources

**Just published**

- **Bioterrorism in Northern Europe**, by C. Saegerman, F. Reviriego-Gordón, Postigo (eds.), 2008
- **Pit Thematic Issue, Scientific and Technical Review, Volume 26 (3), December 2007**

- **Catalogue**
Welcome to the website of the World organisation for animal health (OIE)

The OIE was created in 1924 by 28 countries, and thus predates the United Nations. The founding countries wished to implement an international agreement that would enable them to work together to try to put an end to the epizootics that were devastating their livestock. In particular, they sought an undertaking from infected countries to inform the others in case of an important sanitary event, thereby enabling them to take protective action. They also wished to have information on the most effective methods of controlling the most dangerous animal diseases.

Today, these objectives of sanitary and scientific information in the veterinary field are still among the priority missions of our organisation, both for diseases solely affecting animals and those also transmissible to humans.

In 1994, the Agreements that led to the creation of the World Trade Organization (WTO) included specific measures on the management of sanitary and phytosanitary problems (SPS Agreements) relating to the risks posed by trade in animals and animal products. The standards, guidelines and recommendations issued by the OIE were designated as the international reference in the field of animal diseases and zoonoses. The WTO’s choice of the OIE stems mainly from the fact that our organisation’s decisions are exclusively science-based.

The objectives described above all converge hinge on the implementation of the main mission of our organisation:

To improve the health and the welfare of animals all over the world regardless of the cultural practices or the economic situations in member countries.

I have had the honour of leading this organisation since January 2001, after having long known and appreciated its role, first as a National Delegate to the OIE, then as elected President of the International Animal Health Code Commission. Visitors to our Web site will find answers to most of their questions on animal health, as well as on animal diseases transmissible to humans and several new topics for the OIE, such as animal welfare and animal production food safety.
The World Organisation for Animal Health (OIE)

The need to fight animal diseases at global level led to the creation of the Office International des Epizooties through the International Agreement signed on January 29th 1924. In May 2003 the Office became the World Organisation for Animal Health but kept its historical acronym OIE.

The OIE is the intergovernmental organisation responsible for improving animal health worldwide.

It is recognised as a reference organisation by the World Trade Organization (WTO) and as of January 2008, had a total of 172 Member Countries and Territories. The OIE maintains permanent relations with 36 other international and regional organisations and has Regional and sub-regional offices on every continent.

How does the organisation function?

The organisation is placed under the authority and control of an International Committee consisting of Delegates designated by the Governments of all Member Countries.

The day-to-day operation of the OIE is managed at the Headquarters situated in Paris and placed under the responsibility of a Director General elected by the International Committee. The Headquarters implements the resolutions passed by the International Committee and developed with the support of Commissions elected by the Delegates:

- Administrative Commission
- Regional Commissions (5)
- Specialist Technical Commissions (4)

The OIE’s financial resources are derived principally from compulsory annual contributions backed up by voluntary contributions from Member Countries and Territories.
Objectives of OIE today
Objectives

Transparency

Ensure transparency in the global animal disease situation

Each Member Country undertakes to report the animal diseases that it detects on its territory. The OIE then disseminates the information to other countries, which can take the necessary preventive action. This information also includes diseases transmissible to humans and intentional introduction of pathogens. Information is sent out immediately or periodically depending on the seriousness of the disease. This objective applies to disease occurrences both naturally occurring and deliberately caused. Dissemination is via the OIE Web site, e-mail and the following periodicals: Disease Information, published weekly and the annual compilation World Animal Health.

Scientific information

Collect, analyse and disseminate veterinary scientific information

The OIE collects and analyses the latest scientific information on animal disease control. This information is then made available to the Member Countries to help them to improve the methods used to control and eradicate these diseases. Guidelines are prepared by the network of about 200 OIE Collaborating Centres and Reference Laboratories across the world.

Scientific information is also disseminated through various works and periodicals published by the OIE, notably the Scientific and Technical Review (3 issues a year).

International solidarity

Encourage international solidarity in the control of animal diseases

The OIE provides technical support to Member Countries requesting assistance with animal disease control and eradication operations, including diseases transmissible to humans. The OIE notably offers expertise to the poorest countries to help them control animal diseases that cause livestock losses, present a risk to public health and threaten other Member Countries.

The OIE has a permanent contact to international regional and national financial organizations in order to convince them to invest more and better on the control of animal diseases and zoonosis.
Sanitary safety

Safeguard world trade by publishing health standards for international trade in animals and animal products

The OIE develops normative documents relating to rules that Member Countries can use to protect themselves from the introduction of diseases and pathogens, without setting up unjustified sanitary barriers. The main normative works produced by the OIE are: the Terrestrial Animal Health Code, the Aquatic Animal Health Code and the Manual of Diagnostic Tests for Terrestrial Animals.

The OIE standards are recognised by the World Trade Organization as reference international sanitary rules. They are prepared by elected Specialist Commissions and by Working Groups bringing together internationally renowned scientists, most of whom are experts within the network of about 200 Collaborating Centres and Reference Laboratories that also contribute towards the scientific objectives of the OIE. These standards are adopted by the International Committee.

Promotion of veterinary services

Improve the legal framework and resources of national Veterinary Services

The Veterinary Services and laboratories of developing and transition countries are in urgent need of support to provide them with the necessary infrastructure, resources and capacities that will enable their countries to benefit more fully from the WTO Sanitary and Phytosanitary Agreement (SPS Agreement) while at the same time providing greater protection for animal health and public health and reducing the threat for other countries which are free of diseases.

The OIE considers the Veterinary Services as a Global Public Good and their bringing into line with international standards (structure, organisation, resources, capacities, role of paraprofessionals) as a public investment priority.

Food safety and animal welfare

To provide a better guarantee of food of animal origin and to promote animal welfare through a science-based approach

The OIE Member Countries have decided to provide a better guarantee of the safety of food of animal origin by creating greater synergy between the activities of the OIE and those of the Codex Alimentarius Commission. The OIE's standard-setting activities in this field focus on eliminating potential hazards existing prior to the slaughter of animals or the primary processing of their products (meat, milk, eggs, etc.) that could be a source of risk for consumers.
Developing the OIE standards for aquatic animal health is the responsibility of the Aquatic Animal Health Standards Commission.
It is one of 4 Specialist Commissions of OIE
The Terrestrial Animal Health Standards Commission
("Code Commission")

The Scientific Commission for Animal Diseases
("Scientific Commission")

The Biological Standards Commission
("Laboratories Commission")

Aquatic Animal Health Standards Commission
(“Aquatic Animals Commission”)
The Fish Diseases Commission was created in 1960. One of the reasons for establishing the Commission was the increasing awareness of the importance of international trade in fish and other aquatic animals, and the potential for disease spread.

In 1988, the scope of the Commission was extended to include diseases and pathogens of molluscs and crustaceans and in 2003 the Commission was renamed as the Aquatic Animal Health Standards Commission (in short, Aquatic Animals Commission).

In 2007, amphibian diseases were included in the remit of OIE and the work of the Aquatic Animals Commission.
5 Commission Members

Elections every 3 years by the National Delegates
(of all 174 Member Countries).
Current members of the Commission

President
Eva-Maria Bernoth
Australia

Vice-President
Barry Hill
United Kingdom

Secretary General
Ricardo Enriquez
Chile

Member
Eli Katunguka-Rwakishaya
Uganda

Member
Franck Berthe
Italy
Roles of the Commission
Propose the most appropriate methods for surveillance, diagnosis and disease prevention for sanitary security of trade or international movement of aquatic animals and their products covering diseases listed in the Aquatic Code;

Oversee production of the Aquatic Code and Aquatic Manual;

Promote the dissemination amongst Veterinary and other Competent Authorities of information on aquatic animal diseases;
Keep the International Committee and the Director General informed of scientific progress on methods for surveillance, diagnosis and disease prevention likely to improve the prevention and the control of aquatic animal diseases;

Identify issues that require in-depth review and propose, to the Director General, the composition and terms of reference of experts or Ad hoc Groups of experts convened specifically to study such issues, and if necessary, to participate in the work of these Groups;
Assess applications for appointment as OIE Reference Laboratory and advise the International Committee;

Facilitate and work with the worldwide network of reference laboratories and collaborating centres in the field of aquatic animals, so as to achieve OIE's mandate.
The OIE standards applicable to international trade in aquatic animals are laid out in the OIE Aquatic Animal Health Code and in the OIE Manual of Diagnostic Tests for Aquatic Animals.

Aquatic Animal Health Code

and

Manual of Diagnostic Tests for Aquatic Animals

...crucial reading for anybody involved in aquatic animal health certification, diagnosis, quarantine, risk analysis or movement issues... These publications will be indispensable for veterinary administrators... should serve as useful reference books to all fish/shellfish disease specialists. Australian Veterinary Journal

...the concise and accurate description of diagnostic techniques contained in this Manual is indispensable for anyone involved in the control of aquatic animal diseases. Vlaams Diergeneeskundig Tijdschrift

The aim of the Aquatic Animal Health Code (hereafter referred to as the Aquatic Code) is to assure the sanitary safety of international trade in aquatic animals (fish, molluscs, crustaceans and amphibians) and their products. This is achieved through the detailing of health measures to be used by the veterinary authorities of importing and exporting countries to avoid the transfer of agents pathogenic for animals or humans, while avoiding unjustified sanitary barriers.

The health measures in the Aquatic Code (in the form of standards and recommendations) have been formally adopted by the OIE International Committee. The 11th edition incorporates the modifications to the Aquatic Code agreed during the 76th General Session in May 2008. These include new and revised chapters on the following subjects: definitions, diseases listed by the OIE, obligations and ethics in international trade, import risk analysis, recommendations for safe transport of aquatic animals and aquatic animal products, infectious myonecrosis, white tail disease, infection with Microcystis aeruginosa and gyrodactylosis (Gyrodactylyus salaris). As well, two new chapters on infection with Batrachochytrium dendrobatidis and infection with ranavirus and three new appendices on welfare of farmed fish, control of aquatic animal health hazards in aquatic animal feed and aquatic animal health surveillance were adopted and have been added to this edition of the Aquatic Code.

The development of these standards, guidelines and recommendations is the result of the continuous work of one of the OIE's Specialist Commissions, the OIE Aquatic Animal Health Standards Commission (in brief Aquatic Animals Commission). This Commission, which comprises five elected members and two observers experienced in methods for surveillance, diagnosis, control and prevention of infectious aquatic animal diseases, meets twice yearly to address its work programme. The Commission also draws upon the expertise of internationally renowned specialists to prepare draft texts for new chapters of the Aquatic Code or revise existing chapters in light of advances in veterinary knowledge. The views of the Delegates of Members are systematically sought through the circulation of draft and revised texts. As well, the Aquatic Animals Commission collaborates closely with the OIE Terrestrial Animal Health Standards Commission on issues needing a harmonised approach, and with the Biological Standards and Scientific Commissions to ensure the Aquatic Animals Commission's work is based on the latest scientific information.
GUIDE TO THE USE OF THE AQUATIC ANIMAL HEALTH CODE

A. Introduction

1. The purpose of this guide is to assist the Veterinary Administrations and/or other Competent Authorities of OIE Members to use the Aquatic Animal Health Code (hereafter referred to as the "Aquatic Code") in developing their animal health measures applicable to imports and exports of aquatic animals and aquatic animal products.

2. The recommendations in each of the chapters in Part 2 of the Aquatic Code are designed to prevent the disease in question being introduced into the importing country, taking into account the nature of the commodity and the aquatic animal health status of the exporting country. This means that, correctly applied, the recommendations ensure that the intended importation can take place with an optimal level of animal health security, incorporating the latest scientific findings and available techniques.

3. The recommendations in the Aquatic Code make reference only to the animal health situation in the exporting country, and assume that the disease is either not present in the importing country or is the subject of a control or eradication programme. Therefore, when determining its import measures, an importing country should do so in a way that is consistent with the principle of national treatment and the other provisions of the WTO SPS Agreement. An importing country is always free to authorise the importation of animals or animal products into its territory under conditions either more or less stringent than those recommended by the Aquatic Code, but this must be based on a scientific risk analysis and done in accordance with the country’s obligations under the SPS Agreement.

4. To avoid confusion, key terms and expressions used in the Aquatic Code are defined in Chapter 1.1.1. When preparing model international aquatic animal health certificates, the importing country should endeavour to use these terms and expressions in accordance with the definitions given in the Aquatic Code.

5. At the head of each chapter relating to a specific disease (in Part 2 of the Aquatic Code), there is an article clearly describing the scope of each chapter.

6. In many of the Aquatic Code chapters, the use of diagnostic tests is recommended. In each case, a reference in the first article of the chapter is made to the relevant section in the OIE Manual of Diagnostic Tests for Aquatic Animals (hereafter referred to as the "Aquatic Manual").

7. Section 1.3. of the Aquatic Code deals with obligations and ethics in international trade. Veterinary Administrations and/or other Competent Authorities should have a sufficient number of copies of the Aquatic Code to allow all veterinarians directly involved in such trade to familiarise themselves with the contents. In addition, diagnostic laboratories should be fully conversant with the technical recommendations in the Aquatic Manual.

8. When, in some parts of this Aquatic Code, the term ‘under study’ is applied to an Article or part of an Article, the meaning is that the text has not been adopted by the OIE International Committee and is not part of the Aquatic Code. Accordingly, that recommendation needs to be applied by Members.

9. The complete text of the Aquatic Code has been made available on the OIE Website (address: http://www.oie.int) to ensure wider access.
CHAPTER 1.2.2.

CRITERIA FOR LISTING AQUATIC ANIMAL DISEASES

Article 1.2.2.1.

Criteria for listing an aquatic animal disease

Diseases proposed for listing must meet all of the relevant parameters set for each of the criteria, namely A. Consequences, B. Spread and C. Diagnosis. Therefore, to be listed, a disease must have the following characteristics: 1 or 2 or 3; and 4 or 5; and 6; and 7; and 8. Such proposals should be accompanied by a case definition for the disease under consideration.

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria (A-C)</th>
<th>Parameters that support a listing</th>
<th>Explanatory notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>The disease has been shown to cause significant production losses at a national or multinational (zonal or regional) level.</td>
<td>There is a general pattern that the disease will lead to losses in susceptible species, and that morbidity or mortality are related primarily to the agent and not management or environmental factors. (Morbidity includes, for example, loss of production due to spawning failure.) The direct economic impact of the disease is linked to its morbidity, mortality and effect on product quality.</td>
</tr>
<tr>
<td>2.</td>
<td>Or</td>
<td>The disease has been shown to or scientific evidence indicates that it is likely to negatively affect wild aquatic animal populations that are an asset worth protecting for economic or ecological reasons.</td>
<td>Wild aquatic animal populations can be populations that are commercially harvested (wild fisheries) and hence are an economic asset. However, the asset could be ecological or environmental in nature, for example, if the population consists of an endangered species of aquatic animal or an aquatic animal potentially endangered by the disease.</td>
</tr>
<tr>
<td>3.</td>
<td>Or</td>
<td>The agent is of public health concern.</td>
<td>And</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>Infectious aetiology of the disease is proven.</td>
<td>B. Spread</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>An infectious agent is strongly associated</td>
<td>Infectious diseases of unknown aetiology can have equally high-risk implications as those diseases where the infectious aetiology is proven. Whilst</td>
</tr>
<tr>
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<td>------------------</td>
</tr>
<tr>
<td>1.</td>
<td></td>
<td>The disease has been shown to cause significant production losses at a national or multinational (zonal or regional) level.</td>
<td>There is a general pattern that the disease will lead to losses in susceptible 1 species, and that morbidity or mortality are related primarily to the agent and not management or environmental factors. (Morbidity includes, for example, loss of production due to spawning failure.) The direct economic impact of the disease is linked to its morbidity, mortality and effect on product quality.</td>
</tr>
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<td>2.</td>
<td>Or</td>
<td>The disease has been shown to or scientific evidence indicates that it is likely to negatively affect wild aquatic animal populations that are an asset worth protecting for economic or ecological reasons.</td>
<td>Wild aquatic animal populations can be populations that are commercially harvested (wild fisheries) and hence are an economic asset. However, the asset could be ecological or environmental in nature, for example, if the population consists of an endangered species of aquatic animal or an aquatic animal potentially endangered by the disease.</td>
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<td>Infectious aetiology of the disease is proven.</td>
<td>B. Spread</td>
</tr>
<tr>
<td>5.</td>
<td>Or</td>
<td>An infectious agent is strongly associated with the disease, but the aetiology is not yet known.</td>
<td>Infectious diseases of unknown aetiology can have equally high-risk implications as those diseases where the infectious aetiology is proven. Whilst disease occurrence data are gathered, research should be conducted to elucidate the aetiology of the disease and the results be made available within a reasonable period of time.</td>
</tr>
<tr>
<td>6.</td>
<td>And</td>
<td>Potential for international spread, including via live animals, their products or fomites.</td>
<td>International trade in aquatic animal species susceptible to the disease exists or is likely to develop and, under international trading practices, the entry and establishment of the disease is a likely risk.</td>
</tr>
<tr>
<td>7.</td>
<td>And</td>
<td>Several countries or countries with zones may be declared free of the disease based on the general surveillance principles outlined in Chapter 1.1.4. of the Aquatic Manual.</td>
<td>Free countries/zones could still be protected. Listing of diseases that are ubiquitous or extremely widespread would render notification unfeasible. However, individual countries that run a control programme on such a disease can propose its listing provided they have undertaken a scientific evaluation to support their request. Examples may be the protection of broodstock from widespread diseases, or the protection of the last remaining free zones from a widespread disease.</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>A repeatable and robust means of detection/diagnosis exists.</td>
<td>And</td>
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<td></td>
<td></td>
<td>A diagnostic test should be widely available and preferably has undergone a formal standardisation and validation process using routine field samples (See Aquatic Manual) or a robust case definition is available to clearly identify cases and allow them to be distinguished from other pathologies.</td>
<td>C. Diagnosis</td>
</tr>
</tbody>
</table>
Criteria for listing an emerging aquatic animal disease

A newly recognised disease or a known disease behaving differently may be proposed for listing if it meets the criteria 1 or 2, and 3 or 4. Such proposals should be accompanied by a case definition for the disease under consideration.

<table>
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<tr>
<td>1.</td>
<td>Infectious aetiology of the disease is proven.</td>
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Or

2. An infectious agent is strongly associated with the disease, but the aetiology is not yet known.

Infectious diseases of unknown aetiology can have equally high-risk implications as those diseases where the infectious aetiology is proven. Whilst disease occurrence data are gathered, research should be conducted to elucidate the aetiology of the disease and the results be made available within a reasonable period of time.

And

<table>
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<tr>
<td>3.</td>
<td>The agent is of public health concern.</td>
<td></td>
</tr>
</tbody>
</table>

Or

4. Significant spread in naive populations of wild or cultured aquatic animals.

The disease has exhibited significant morbidity, mortality or production losses at a zone, compartment or country level. ‘Naive’ means animals previously unexposed either to a new disease or a new form of a known disease.

1. ‘Susceptible’ is not restricted to ‘susceptible to clinical disease’ but includes ‘susceptible to covert infections’.
CHAPTER 1.2.3.

DISEASES LISTED BY THE OIE

Preamble: The following diseases are listed by the OIE according to the criteria for listing an aquatic animal disease (see Article 1.2.2.1) or criteria for listing an emerging aquatic animal disease (see Article 1.2.2.2).

Article 1.2.3.1.

The following diseases of fish are listed by the OIE:

- Epizootic haematopoietic necrosis
- Infectious haematopoietic necrosis
- Spring viraemia of carp
- Viral haemorrhagic septicaemia
- Infectious salmon anaemia
- Epizootic ulcerative syndrome
- Gyrodactylosis (Gyrodactylyus salaris)
- Red sea bream iridoviral disease
- Koi herpesvirus disease.

Article 1.2.3.2.

The following diseases of molluscs are listed by the OIE:

- Infection with Annamia ostreae
- Infectious salmon anaemia
- Epizootic ulcerative syndrome
- Gyrodactylosis (Gyrodactylus salaris)
- Red sea bream iridoviral disease
- Koi herpesvirus disease.

Article 1.2.3.2.

The following diseases of molluscs are listed by the OIE:

- Infection with Bonamia ostreae
- Infection with Bonamia exitiosa
- Infection with Marteilia refringens
- Infection with Perkinsus marinus
- Infection with Perkinsus olseni
- Infection with *Xenohaliotis californiensis*
- Abalone viral mortality

Article 1.2.3.3.
The following diseases of crustaceans are listed by the OIE:

- Taura syndrome
- White spot disease
- Yellowhead disease
- Tetrahedral baculovirosis (Baculovirus penaei)
- Spherical baculovirosis (Penaeus monodon-type baculovirus)
- Infectious hypodermal and haematopoietic necrosis
- Crayfish plague (Aphanomyces astaci)
- Necrotising hepatopancreatitis
- Infectious myonecrosis
- White tail disease
- Hepatopancreatic parovirus disease
- Mourilyan virus disease

1. Listed according to Article 1.2.2.2.
2. Listing of this disease is under study.
- Spherical baculovirus (*Penaeus monodon*-type baculovirus)
- Infectious hypodermal and haematopoietic necrosis
- Crayfish plague (*Aphanomyces astaci*)
- Necrotising hepatopancreatitis
- Infectious myonecrosis
- White tail disease
- Hepatopancreatic parovirus disease
- Mourilyan virus disease

**Article 1.2.3.4.**

The following *diseases* of amphibians are listed by the OIE:

- Infection with *Batrachochytrium dendrobatidis*
- Infection with ranavirus.

1. Listed according to Article 1.2.2.2.
2. Listing of this disease is under study.
Amphibians: frogs, toads, salamanders, newts
Aquatic animal diseases listed by OIE

9 fish diseases
7 mollusc diseases
12 crustacean diseases
2 amphibian diseases
Diseases of fish (2008)

Epizootic haematopoietic necrosis
Infectious haematopoietic necrosis
Spring viraemia of carp
Viral haemorrhagic septicaemia
Infectious salmon anaemia
Epizootic ulcerative syndrome
Gyrodactylosis (*Gyrodactylus salaris*)
Red sea bream iridoviral disease
Koi herpesvirus disease (2007)
Diseases of molluscs (2008)

Infection with *Bonamia ostreae*

Infection with *Bonamia exitiosa*

Infection with *Marteilia refringens*

Infection with *Perkinsus marinus*

Infection with *Perkinsus olseni*

Infection with *Xenohaliotis californiensis.*

Abalone viral mortality

1 Listed according to Article 1.2.2.2 (Emerging disease)
Diseases of crustaceans (2008)

Taura syndrome
White spot disease
Yellowhead disease
Tetrahedral baculovirosis
Spherical baculovirosis
Infectious hypodermal and haematopoietic necrosis
Crayfish plague
Necrotising hepatopancreatitis
Infectious myonecrosis
White tail disease
Hepatopancreatic parvovirus disease
Mourilyan virus disease

1 Listed according to Article 1.2.2.2 (Emerging disease)
2 Listing of this disease is under study
Diseases of amphibians (2008)

Infection with ranavirus

Infection with *Bachatrochytrium dendrobatidis*
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PART 2.

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CHAPTER 2.1.17.
KOI HERPESVIRUS DISEASE

Article 2.1.17.1.

For the purposes of the Aquatic Code, koi herpesvirus disease (KHVD) means infection with the viral species koi herpesvirus (KHV) tentatively placed in the sub-family Cyprinid herpesviridae of the family Herpesviridae.

Methods for conducting surveillance and diagnosis of koi herpesvirus disease are provided in the Aquatic Manual.

Article 2.1.17.2.

Scope

The recommendations in this Chapter apply to: common carp (Cyprinus carpio carpio), ghost carp (Cyprinus carpio gibelio), koi carp (Cyprinus carpio koi) and common carp hybrids (e.g. Cyprinus carpio x Carassius auratus). These recommendations also apply to any other susceptible species referred to in the Aquatic Manual when traded internationally.

Article 2.1.17.3.

Commodities

1. When authorising the importation or transit of the following commodities, the Competent Authorities should not require any KHVD related conditions, regardless of the KHVD status of the exporting country, zone or compartment:

   a. For the species referred to in Article 2.1.17.2, intended for any purpose:
      i. Commodities treated in a manner that inactivates the disease agent e.g. leather made from fish skin, pasteurised products and some ready-to-eat meals and fish oil and fish meat intended for use in food;
      ii. Biological samples preserved for diagnostic applications in such a manner as to inactivate the disease agent;

   b. The following commodities destined for human consumption from the species referred to in Article 2.1.17.2, which have been prepared and packaged for direct retail trade:
      i. Eviscerated fish (chilled or frozen);
Koi herpesvirus disease free country

A country may make a self-declaration of freedom from KHVD if it meets the conditions in points 1, 2, 3 or 4 below.

If a country shares a zone with one or more other countries, it can only make a self-declaration of freedom from KHVD if all the areas covered by the shared water are declared KI-VD free countries or zones (see Article 2.1.17.5).

1. A country where none of the susceptible species is present may make a self-declaration of freedom from KHVD when basic biosecurity conditions have been continuously met in the country for at least the past 2 years.

OR

2. A country where the species referred to in Article 2.1.17.2, are present but there has been no observed occurrence of the disease for at least the past 10 years despite conditions that are conducive to its clinical expression, as described in Chapter 2.1.17. of the Aquatic Manual, may make a self-declaration of freedom from KHVD when basic biosecurity conditions have been continuously met in the country for at least the past 10 years.

OR

3. A country where the last observed occurrence of the disease was within the past 10 years or where the infection status prior to targeted surveillance was unknown (e.g. because of the absence of conditions conducive to its clinical expression as described in Chapter 2.1.17. of the Aquatic Manual) may make a self-declaration of freedom from KHVD when:

   a. basic biosecurity conditions have been continuously met for at least the past 2 years; and

   b. targeted surveillance, as described in Chapters 3.3.1. of the Aquatic Code and 2.1.17. of the Aquatic Manual, has been in place for at least the last 2 years without detection of KHVD.

OR

4. A country that has previously made a self-declaration of freedom from KI-VD but in which the disease is subsequently detected may make a self-declaration of freedom from KHVD again when the following conditions have been met:

   a. on detection of the disease, the affected area was declared an infected zone and a buffer zone was established, and

   b. infected populations have been destroyed or removed from the infected zone by means that minimise the risk of further spread of the disease, and the appropriate disinfection procedures (see Aquatic Manual) have been completed, and

   c. targeted surveillance, as described in Chapters 3.3.1. of the Aquatic Code and 2.1.17. of the Aquatic Manual, has been in place for at least the last 2 years without detection of KHVD, and

   d. previously existing basic biosecurity conditions have been reviewed and modified as necessary and have continuously been in place for at least the past 2 years.

In the meantime, part of the non-affected area may be declared a free zone provided that such part meets the conditions in point 3 of Article 2.1.17.5.

Article 2.1.17.5.

Koi herpesvirus disease free zone or free compartment
Importation of live aquatic animals from a country, zone or compartment declared free from koi herpesvirus disease

When importing live aquatic animals of species referred to in Article 2.1.17.2, from a country, zone or compartment declared free from KHVD, the Competent Authority of the importing country should require an international aquatic animal health certificate issued by the Competent Authority of the exporting country or a certifying official approved by the importing country attesting that, on the basis of the procedures described in Articles 2.1.17.4, or 2.1.17.5, (as applicable), the place of production of the aquatic animal is a country, zone or compartment declared free from KHVD.

The certificate should be in accordance with the Model Certificate in Appendix 4.1.1.

This Article does not apply to commodities referred to in point 1 of Article 2.1.17.3.

Article 2.1.17.8.

Importation of live aquatic animals for aquaculture from a country, zone or compartment not declared free from koi herpesvirus disease

1. When importing, for aquaculture, live aquatic animals of species referred to in Article 2.1.17.2, from a country, zone or compartment not declared free from KHVD, the Competent Authority of the importing country should assess the risk and, if justified, apply the following risk mitigation measures:
   a. the direct delivery to and lifelong holding of the consignment in biosecure facilities for continuous isolation from the local environment; and
   b. the treatment of all effluent and waste materials in a manner that ensures inactivation of koi herpesvirus.

2. If the intention of the introduction is the establishment of a new stock, the Code of Practice on the Introductions and Transfers of Marine Organisms of the International Council for the Exploration of the Seas (ICES) should be followed.

3. For the purposes of the Aquatic Code, the ICES Code (full version see: http://www.ices.dk/index dex.asp) may be summarised to the following main points:
   a. identify stock of interest (cultured or wild) in its current location;
   b. evaluate stock health/disease history;
   c. take and test samples for KHV, pests and general health/disease status;
   d. import and quarantine in a secure facility a founder (F-0) population;
   e. produce F-1 generation from the F-0 stock in quarantining;
   f. culture F-1 stock and at critical times in its development (life cycle) sample and test for KHV and perform general examinations for pests and general health/disease status;
   g. if KHV is not detected, pests are not present, and the general health/disease status of the stock is considered to meet the basic biosecurity conditions of the importing country, zone or compartment, the F-1 stock may be defined as KHVD free or specific pathogen free (SPF) for KHV,
Importation of live aquatic animals for processing for human consumption from a country, zone or compartment not declared free from koi herpesvirus disease

When importing, for processing for human consumption, live aquatic animals of species referred to in Article 2.1.17.2, from a country, zone or compartment not declared free from KHV, the Competent Authority of the importing country should assess the risk and, if justified, require that:

1. the consignment be delivered directly to and held in quarantine facilities for slaughter and processing to one of the products referred to in point 1 of Article 2.1.17.3, or other products authorised by the Competent Authority;

2. all effluent and waste materials from the processing be treated in a manner that ensures inactivation of koi herpesvirus.

Members may wish to consider introducing internal measures to prevent such commodities being used for any purpose other than for human consumption.

This Article does not apply to commodities referred to in point 1 of Article 2.1.17.3.

Article 2.1.17.10.

Importation of live aquatic animals intended for use in animal feed, or for agricultural, industrial or pharmaceutical use, from a country, zone or compartment not declared free from koi herpesvirus disease

When importing, for use in animal feed, or for agricultural, industrial or pharmaceutical use, live aquatic animals of species referred to in Article 2.1.17.2, from a country, zone or compartment not declared free from KHV, the Competent Authority of the importing country should require that:

1. the consignment be delivered directly to and held in quarantine facilities for slaughter and processing to products authorised by the Competent Authority;

2. all effluent and waste materials from the processing be treated in a manner that ensures inactivation of koi herpesvirus.

This Article does not apply to commodities referred to in point 1 of Article 2.1.17.3.

Article 2.1.17.11.

Importation of aquatic animal products from a country, zone or compartment declared free from koi herpesvirus disease

When importing aquatic animal products of species referred to in Article 2.1.17.2, from a country, zone or compartment declared free from KHV, the Competent Authority of the importing country should require an international aquatic animal health certificate issued by the Competent Authority of the exporting country or a certifying official approved by the importing country, attesting that, on the basis of the procedures described in Articles 2.1.17.4 or 2.1.17.5 (as applicable), the place of production of the commodity is a country, zone or compartment declared free from KHV.

The certificate should be in accordance with the Model Certificate in Appendix 4.2.1.

This Article does not apply to commodities referred to in point 1 of Article 2.1.17.3.

Article 2.1.17.12.
Article 2.1.17.3.

Commodities

1. When authorising the importation or transit of the following commodities, the Competent Authorities should not require any KHVD related conditions, regardless of the KHVD status of the exporting country, zone or compartment:

   a. For the species referred to in Article 2.1.17.2, intended for any purpose:

      i. commodities treated in a manner that inactivates the disease agent e.g. leather made from fish skin, pasteurised products and some ready-to-eat meals; and fish oil and fish meal intended for use in feed;

      ii. biological samples preserved for diagnostic applications in such a manner as to inactivate the disease agent.

   b. The following commodities destined for human consumption from the species referred to in Article 2.1.17.2, which have been prepared and packaged for direct retail trade:

      i. eviscerated fish (chilled or frozen);

      ii. fillets or cutlets (chilled or frozen);

      iii. dried eviscerated fish (including air dried, flame dried and sun dried).

For the commodities referred to in point 1b), Members may wish to consider introducing internal measures to prevent the commodity being used for any purpose other than for human consumption.

2. When authorising the importation or transit of commodities of a species referred to in Article 2.1.17.2, other than those referred to in point 1 of Article 2.1.17.3, the Competent Authorities should require the conditions prescribed in Articles 2.1.17.7 to 2.1.17.12, relevant to the KHVD status of the exporting country, zone or compartment.

3. When considering the importation/transit from an exporting country, zone or compartment not declared free of KHVD of a live commodity from a species not covered in Article 2.1.17.2, but which could reasonably be expected to be a potential mechanical vector for KHV, the Competent Authorities should conduct a risk analysis in accordance with the recommendations in the Aquatic Code. The exporting country should be informed of the outcome of this assessment.

Article 2.1.17.4.

Koi herpesvirus disease free country

A country may make a self-declaration of freedom from KHVD if it meets the conditions in points 1, 2, 3 or 4 below.

If a country declares freedom, it will have to confirm annually through a self-declaration or through a letter of confirmation of freedom from KHVD if all the conditions are fulfilled.
Disease notification and reporting to OIE
Objectives

Transparency

Ensure transparency in the global animal disease situation

Each Member Country undertakes to report the animal diseases that it detects on its territory. The OIE then disseminates the information to other countries, which can take the necessary preventive action. This information also includes diseases transmissible to humans and intentional introduction of pathogens. Information is sent out immediately or periodically depending on the seriousness of the disease. This objective applies to disease occurrences both naturally occurring and deliberately caused. Dissemination is via the OIE Web site, e-mail and the following periodicals: Disease Information, published weekly and the annual compilation World Animal Health.

Scientific information

Collect, analyse and disseminate veterinary scientific information

The OIE collects and analyses the latest scientific information on animal disease control. This information is then made available to the Member Countries to help them to improve the methods used to control and eradicate these diseases. Guidelines are prepared by the network of about 200 OIE Collaborating Centres and Reference Laboratories across the world.

Scientific information is also disseminated through various works and periodicals published by the OIE, notably the Scientific and Technical Review (3 issues a year).

International solidarity

Encourage international solidarity in the control of animal diseases

The OIE provides technical support to Member Countries requesting assistance with animal disease control and eradication operations, including diseases transmissible to humans. The OIE notably offers expertise to the poorest countries to help them control animal diseases that cause livestock losses, present a risk to public health and threaten other Member Countries.

The OIE has a permanent contact to international regional and national financial organizations in order to convince them to invest more and better on the control of animal diseases and zoonosis.
CHAPTER 1.2.1.

NOTIFICATION OF DISEASES AND EPIDEMIOLOGICAL INFORMATION

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Article 1.2.1.1.

For the purposes of the Aquatic Code and in terms of Articles 5, 9 and 10 of the Statutes, every Member Country of the OIE shall recognise the right of the Central Bureau to communicate directly with the Veterinary Administration of its territory or territories.

All notifications and all information sent by the OIE to the Veterinary Administration shall be regarded as having been sent to the country concerned and all notifications and all information sent to the OIE by the Veterinary Administration shall be regarded as having been sent by the country concerned.

Article 1.2.1.2.

1. Countries shall make available to other countries, through the OIE, whatever information is necessary to minimise the spread of aquatic animal diseases and their aetiological agents and to assist in achieving better world-wide control of these diseases.

2. To achieve this, countries shall comply with the reporting requirements specified in Article 1.2.1.3.

3. To assist in the clear and concise exchange of information, reports shall conform as closely as possible to the current OIE disease reporting format.

4. Recognising that scientific knowledge concerning the relationship between disease agents and diseases is constantly evolving and that the presence of an infectious agent does not necessarily imply the presence of a disease, countries shall ensure through their reports that they comply with the spirit and intention of paragraph 1 above. This means that the presence of an infectious agent, even in the absence of clinical disease, should be reported.

5. In addition to notifying findings in accordance with Article 1.2.1.3., countries shall also provide information on the measures taken to prevent the spread of diseases, including possible quarantine measures and restrictions on the movement of aquatic animals, aquatic animal products, biological products and other miscellaneous objects that could by their nature be responsible for transmission of disease. In the case of diseases transmitted by vectors, the measures taken against such vectors shall also be described.
Veterinary Administrations shall send to the OIE:

1. Immediate notification (within 24 hours), by fax or electronically, of any of the following events:
   a. for diseases listed by the OIE, the first occurrence or re-occurrence of a disease in a country or zone or compartment of the country, if the country or zone or compartment of the country was previously considered to be free of that particular disease, or
   b. for diseases listed by the OIE, if the disease has occurred in a new host species; or
   c. for diseases listed by the OIE, if the disease has occurred with a new pathogen strain or in a new disease manifestation; or
   d. for diseases listed by the OIE, if the disease has a newly recognised zoonotic potential; or
   e. for diseases not listed by the OIE, if there is a case of an emerging disease or pathogenic agent should there be findings that are of epidemiological significance to other countries.

In deciding whether findings justify immediate notification (within 24 hours), countries must ensure that they comply with the obligations of Section 1.3 of the Aquatic Code (especially Article 1.3.1.1), to report developments that may have implications for international trade.

2. Weekly reports by fax or electronically subsequent to a notification under paragraph 1 above, to provide further information on the evolution of an incident that justified immediate notification. These reports should continue until the disease has been eradicated or the situation has become sufficiently stable that six-monthly reporting under point 3 will satisfy the obligation of the country to the OIE; in each case, a final report on the incident should be submitted.

3. Six-monthly reports on the absence or presence and evolution of diseases listed by the OIE, and findings of epidemiological significance to other countries with respect to diseases that are not listed.

4. An annual questionnaire concerning any other information of significance to other countries.
Information received on 11/08/2008 from Mrs Simona Salamon, Deputy Chief Veterinary Officer, Administration Directorate, General Veterinary Administration, Ministry of Agriculture, Forestry and Food, LJUBLJANA, Slovenia

**Summary**

<table>
<thead>
<tr>
<th>Report type</th>
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<tr>
<td>Start date</td>
<td>21/07/2008</td>
</tr>
<tr>
<td>Date of first confirmation of the event</td>
<td>01/08/2008</td>
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<tr>
<td>Report date</td>
<td>11/08/2008</td>
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<tr>
<td>Date submitted to OIE</td>
<td>11/08/2008</td>
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<tr>
<td>Reason for notification</td>
<td>First occurrence of a listed disease</td>
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<tr>
<td>Causal agent</td>
<td>Koi herpesvirus</td>
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<tr>
<td>Nature of diagnosis</td>
<td>Suspicion, Laboratory (advanced)</td>
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<td>This event pertains to</td>
<td>the whole country</td>
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<td>Related reports</td>
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<tr>
<td>• Immediate notification (11/08/2008)</td>
<td></td>
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<tr>
<td>• Follow-up report No. 1 (19/09/2008)</td>
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**New outbreaks**

<table>
<thead>
<tr>
<th>Outbreak 1</th>
<th>Pond Betnava, MARIBOR</th>
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<tbody>
<tr>
<td>Date of start of the outbreak</td>
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<tr>
<td>Outbreak status</td>
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<tr>
<td>Epidemiological unit</td>
<td>Pond</td>
</tr>
<tr>
<td>Water type</td>
<td>Fresh water</td>
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<tr>
<td>Population type</td>
<td>Farmed</td>
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<tr>
<td>Production system</td>
<td>Semi-closed</td>
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<table>
<thead>
<tr>
<th>Affected animals</th>
<th>Species</th>
<th>Morbidity</th>
<th>Mortality</th>
<th>Susceptible</th>
<th>Cases</th>
<th>Deaths</th>
<th>Destroyed</th>
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<tr>
<td></td>
<td>Common carp</td>
<td>3%</td>
<td>3%</td>
<td>5000</td>
<td>150</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Cyprinus carpio)</td>
<td>(kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Affected population | common carps of approximately 2 kg |

**Summary of outbreaks**

| Total outbreaks: 1 |

<table>
<thead>
<tr>
<th>Outbreak statistics</th>
<th>Species</th>
<th>Apparent morbidity rate</th>
<th>Apparent mortality rate</th>
<th>Apparent case fatality rate</th>
<th>Proportion survived</th>
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<tbody>
<tr>
<td>Species</td>
<td>Mortality</td>
<td>Morbidity</td>
<td>Susceptible</td>
<td>Cases</td>
<td>Deaths</td>
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</tr>
<tr>
<td>Common carp (Cyprinus carpio) (kg)</td>
<td>3%</td>
<td>3%</td>
<td>5000</td>
<td>150</td>
<td>150</td>
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**Affected population**
- Common carps of approximately 2 kg

**Summary of outbreaks**
- Total outbreaks: 1

**Outbreak statistics**

<table>
<thead>
<tr>
<th>Species</th>
<th>Apparent morbidity rate</th>
<th>Apparent mortality rate</th>
<th>Apparent case fatality rate</th>
<th>Proportion animals lost</th>
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</thead>
<tbody>
<tr>
<td>Common carp (Cyprinus carpio) (kg)</td>
<td>3.00%</td>
<td>3.00%</td>
<td>100.00%</td>
<td>**</td>
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</tbody>
</table>

* Removed from the susceptible population through death, destruction and/or slaughter
** Not calculated because of missing information

**Epidemiology**
- Source of the outbreak(s) or origin of infection: Unknown or inconclusive

**Control measures**
- Measures applied:
  - Movement control inside the country
  - Zoning
  - Tracing forward
  - Tracing back
  - No vaccination
  - No treatment of affected animals

- Measures to be applied:
  - Disinfection of infected premises/establishment(s)
  - Surveillance outside containment and/or buffer zone
  - Surveillance within containment and/or buffer zone

**Diagnostic test results**
- Laboratory name and type: National Veterinary Institute (national reference laboratory), Ljubljana (National laboratory)
- Tests and results:
  - Species: Common carp (Cyprinus carpio)
  - Test: Polymerase chain reaction (PCR)
  - Test date: 01/08/2008

**Future Reporting**
The event is continuing. Weekly follow-up reports will be submitted.

**Map of outbreak locations**
Future Reporting
The event is continuing. Weekly follow-up reports will be submitted.

Map of outbreak locations
Location of current outbreaks
### Summary

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<td>01/08/2008</td>
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<tr>
<td>Report date</td>
<td>19/09/2008</td>
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<tr>
<td>Date submitted to OIE</td>
<td>19/09/2008</td>
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<td>Reason for notification</td>
<td>First occurrence of a listed disease</td>
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<td>Causal agent</td>
<td>Koi herpesvirus</td>
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<td>Nature of diagnosis</td>
<td>Suspicion, Laboratory (advanced)</td>
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<tr>
<td>This event pertains to</td>
<td>the whole country</td>
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### New outbreaks

#### Outbreak 1
- **Location**: Nebova, MARIBOR
- **Date of start of the outbreak**: 08/08/2008
- **Outbreak status**: Continuing (or date resolved not provided)
- **Epidemiological unit**: Pond
- **Water type**: Fresh water
- **Population type**: Farmed
- **Production system**: Semi-closed
- **Affected animals**
  - **Species**: Common carp, *Cyprinus carpio* (kg)
  - **Morbidity**: 10%
  - **Mortality**: 10%
  - **Susceptible**: 1500
  - **Cases**: 160
  - **Deaths**: 160
- **Affected population**: carps of approximately 1 kg of weight

#### Outbreak 2
- **Location**: Transom, MARIBOR
- **Date of start of the outbreak**: 09/08/2008
- **Outbreak status**: Continuing (or date resolved not provided)
- **Epidemiological unit**: Pond
Koi herpesvirus disease, Slovenia

Information received on 22/10/2008 from Mrs Simona Salamon, Deputy Chief Veterinary Officer, Administration Directorate, General Veterinary Administration, Ljubljana, Slovenia

Summary

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<td>Causal agent</td>
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<td>Follow-up report No. 2 (22/10/2008)</td>
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New outbreaks

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<td>Affected animals</td>
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Outbreak 2

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Aquatic Animals Commission

Latest disease reports: Koi herpesvirus disease, Slovenia (Follow-up report No. 1) Abalone viral ganglioneuritis, Australia (Immediate notification)

Other disease reports:

- 25/06/2008  Viral haemorrhagic septicaemia, Bulgaria (Follow-up report No. 1, Final report)
- 09/06/2008  Koi herpesvirus disease, Slovenia (Immediate notification)
- 16/07/2008  Viral haemorrhagic septicaemia, Slovakia (Immediate notification)
- 11/07/2008  Infectious hypodermal and haematopoietic necrosis, Australia (Immediate notification)
- 02/07/2008  White spot disease, United States of America (Follow-up report No. 1)
- 05/06/2008  Infectious myonecrosis, Brazil (Immediate notification)
- 21/04/2008  Viral haemorrhagic septicaemia, Belgium (Follow-up report No. 1)
- 18/04/2008  Infection with Bonamia ostreae, United Kingdom (Follow-up report No. 1)
- 01/04/2008  Infectious haematopoietic necrosis, Slovenia (Follow-up report No. 1)

Focus on: Report of the Aquatic Animals Commission meeting, March 2008

Report of 76th General Session of the OIE International Committee, May 2008 (AAC report is in Fifth Plenary Session)

Databases of aquatic animal diseases

Import risk analysis

National disease contingency plans
Aquatic Animals Commission is assisted by

9 Ad hoc Groups
Ad hoc groups assisting the AAHSC

Ad hoc group on OIE list of aquatic animal diseases

Ad hoc group on fish disease chapters for the Aquatic Code

Ad hoc group on mollusc disease chapters for the Aquatic Code

Ad hoc group on crustacean disease chapters for the Aquatic Code

Ad hoc group on on aquatic animal transport

Ad hoc group on the slaughter and killing of aquatic animals

Ad hoc group on aquatic animal health surveillance

Ad hoc group on amphibian diseases

Ad hoc group on aquatic animal feed
Ad hoc Groups

- Ad hoc Group on the OIE List of Aquatic Animal Diseases
- Ad hoc Group on New Chapters on Fish Diseases for the Aquatic Code and Manual
- Ad hoc Group on New Chapters on Mollusc Diseases for the Aquatic Code and Manual
- Ad hoc Group on New Chapters on Crustacean Diseases for the Aquatic Code and Manual
- Ad hoc Group on Surveillance Chapters for the Aquatic Manual
- Ad hoc Group on Slaughter/Killing of Fish
- Ad hoc Group on Aquatic Animal Transport
- Ad hoc Group on Amphibian Diseases
- Ad hoc Group on Aquatic Animal Feed
- Ad hoc Group on Commodities Derived from Aquatic Animals

Reports of the ad hoc groups are included as Appendices to the reports of the Commission
Manual of Diagnostic Tests for Aquatic Animals 2006
Manual of Diagnostic Tests for Aquatic Animals 2006

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CHAPTER 1.1.2. Principles of validation of diagnostic assays for infectious diseases
CHAPTER 1.1.3. Validation and quality control of polymerase chain reaction methods used for the diagnosis of infectious diseases
CHAPTER 1.1.4. Requirements for surveillance for international recognition of freedom from infection
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1. Case definition

Koi herpesvirus disease (KHVD) is a herpesvirus infection (17) capable of inducing a contagious and acute viraemia in common carp (Cyprinus carpio) and varieties such as koi carp and ghost carp (15).

2. Information for the design of surveillance programmes

a) Agent factors

The aetiological agent is koi herpesvirus (KHV) in the family Herpesviridae (17, 40) although it has also been given the name carp interstitial nephritis and gill necrosis virus (CIGNV) (18, 28). Waltzek et al (39) provided evidence to support the classification of the virus as a herpesvirus, and named it cyprinid herpesvirus 3 (CyHV-3) following the nomenclature of other cyprinid herpesviruses: CyHV-1 (carp pox virus, fish papilloma) and CyHV-2 (goldfish haematopoietic necrosis virus). Estimates of the genome size of KHV vary from at least 158 kbp (11) to 277 kbp (10) to 295 kbp (39). Four genes coding for a helicase, an intercapsid protein, DNA polymerase, and major capsid protein have been identified, and sequence analysis of these genes has shown that KHV is closely related to CyHV-1 and CyHV-2, and distantly related to channel catfish virus (clariroid herpesvirus; KHV-1) (39). Estimates of virion size also vary. Nucleocapsids negative stained virus have been measured at 103–112 nm diameter surrounded by an envelope (17, 10, 37). The nucleocapsids of this sectioned virus have been measured at 80–110 and 110–120 nm in diameter (4, 17, 26).

Serum from koi carp containing antibodies to KHV have been shown to cross-react with CyHV-1, a further indication that these viruses are closely related. Evidence of cross-reacting antibodies was demonstrated in reciprocal enzyme-linked immunosorbent assay (ELISA) and western blot analyses of serum from koi infected with CyHV-1 or KHV (1).

Comparisons of the genomes of KHV isolates from different geographical areas by restriction enzyme analysis (9, 15) or nucleotide sequence analysis (13, 29) have shown them to be practically identical. Likewise, the polypeptides of KHV isolates from different geographic areas were similar, although one isolate from Israel had two additional polypeptides (7, 9).

The virus is inactivated by UV radiation and temperatures above 50°C for 1 minute. The following disinfectants are also effective for inactivation: iodophore at 20 mg/litre for 20 minutes, benzalkonium chloride at 60 mg/litre for 20 minutes, ethyl alcohol at 50% for 20 minutes and sodium hypochlorite at 200 mg/litre for 3 seconds, all at 15°C (21).
3. **Diagnostic methods**

Diagnosis of KHV in clinically affected fish can be achieved by virus isolation. However, the virus is isolated in only a limited number of cell lines and these cells can be difficult to handle. Also, cell culture isolation is not as sensitive as the published PCR-based methods to detect KHV DNA and is not considered to be a reliable diagnostic method for KHV (15). Immunodiagnostic methods, similar to those used for diagnosis of SVC (e.g. immunofluorescence (IF) tests or ELISAs), may be suitable for rapid identification of KHV but have not been extensively reported, compared or validated. Until such time as validated tests are available, diagnosis of KHV should not rely on just one test but a combination of two or three tests (15).

KHV infection produces a detectable antibody response in carp and enzyme immunoassays that reliably detect these antibodies have been published (1, 28). These methods can be used as rapid presumptive tests during the acute disease, however various parameters, such as antibody sensitivity and specificity and sample preparation, can influence the results and therefore a negative result should be viewed with caution.

Detection of antibodies may prove to be a valuable method of establishing previous exposure to KHV in apparently healthy fish, and until PCR-based methods have been developed that are able to reliably detect persistent virus in exposed fish, antibody assays may be the only surveillance tools available. However, due to insufficient knowledge of the serological responses of fish to virus infections, the detection of fish antibodies to KHV has not thus far been accepted as a routine screening method for assessing the viral status of fish populations. Validation of some serological techniques for certain fish virus infections could arise in the near future, rendering the usefulness of fish serology more widely acceptable for health screening purposes.

Fish material suitable for virological examination is:

- **Asymptomatic fish** (apparently healthy fish): Gill, kidney, spleen, and encephalon (any size fish).
- **Clinically affected fish**: Gill, kidney, spleen, gut and encephalon (any size fish).

a) **Field diagnostic methods**

During a KHV outbreak there will be a noticeable increase in mortality in the population. All age groups of fish appear to be susceptible to KHV, although, generally, younger fish up to 1 year are more susceptible to clinical disease. Fish become lethargic, separate from the school and gather at the water inlets or sides of a pond and gasp at the surface of the water. Some fish may experience loss of equilibrium and disorientation but they may also show signs of hyperactivity. On closer examination of individual fish, typical clinical signs include pale discoloration or reddening of the skin, which may also have a rough texture, focal or total loss of epithelium, over- or under-production of mucus on the skin and gills. Other gross signs include erthrothromia (sunken eyes) and haemorrhages on the skin and base of the fins and fin erosion.

b) **Clinical methods**

There are no pathognomonic gross lesions. Final diagnosis must await direct detection of viral DNA or antigen in tissues or virus isolation and identification. However, the most consistent gross pathology is seen in the gills and this can vary in extent from pale necrotic patches to extensive discoloration, severe necrosis and inflammation. Further examination can reveal erosion of primary lamellae, fusion of secondary lamellae, and swelling at the tips of the primary and secondary lamellae.

Other internal lesions are variable in occurrence and often absent in cases of sudden mortality. Other gross pathologies that have been reported include adhesions in the abdominal cavity with or without abnormal colouration of internal organs (lighter or darker). The kidney or liver may be enlarged, and they may also exhibit petechial or focal haemorrhages.

Presence of gross pathologies may also be complicated because diseased fish, particularly common carp, are also infected with ectoparasites such as Angulus sp., Chilodonella sp., Cryptobia sp., Dactylogyrus sp., Gyrodactylus sp., Ichthyobodo sp., Ichthyophthirius sp., Ichthyophthirius sp., and gill monogeneans, as well as numerous species of bacteria.

The histopathology of the disease can be non-specific and variable, but inflammation and necrosis of gill tissues is a consistent feature. Gills also exhibit hyperplasia and hypertrophy of branchial epithelium, and fusion of secondary lamellae and adhesion of gill filaments can be seen. Necrosis, ranging from small areas of necrotic epithelial cells of secondary lamellae to complete loss of the lamellae is observed. Branchial epithelial cells and leucocytes may have prominent nuclear swelling, margination of chromatin to give a “signet ring” appearance and pale diffuse eosinophilic intranuclear inclusions have been observed. Inflammation, necrosis and nuclear inclusions have been observed (individually or together) in other organs, particularly the kidney, but also in the spleen, pancreas, liver, brain, gut and oral epithelium.

c) **Agent detection and identification methods**

Detailed methods are not presented here because there have not been extensive comparison and validation of detection and identification methods for KHV. However,
i) Isolation of KHV in cell culture

The virus can be isolated in a limited number of cell cultures, but cell culture isolation is not as sensitive as PCR and is not considered to be a reliable diagnostic method for KHVD (15).

The virus replicates in koi fin cells (KF-1) (17), carp fin (CaF-2) and carp brain (CCB) cells (24), and in primary cells from fins of common or koi carp (19, 26, 28). Other cell lines used routinely for isolation of fish pathogenic viruses such as EPC, FHM, BF-2, CHSE-214 and RTG-2 cells are refractory to the virus (4, 19, 24, 37). The virus is most abundant in gill, kidney, and spleen tissues during the course of overt infection (10) and it is recommended to sample these tissues for virus isolation. The optimum incubation temperature for virus isolation in KF-1 or CCB cells is 20°C but 8–12 days’ incubation may be required before a cytopathic effect (CPE) is observed (7).

ii) Identification of virus isolated in cell culture

Viruses isolated in cell culture must be definitively identified, as a number of different viruses have been isolated from carp exhibiting clinical signs resembling those of KHVD (5, 15).

Rapid presumptive methods

Immunodiagnostic methods, similar to those used for presumptive identification of SVC (e.g. IF tests or ELISAs), may well be suitable for rapid identification and diagnosis of KHVD (27, 32).

Confirmatory identification methods

The most reliable method for confirmatory identification is by PCR, or one of its variants, which have also been used to identify KHV DNA directly in fish tissues (2, 8–11, 13, 19, 20, 27, 40).

A PCR based on the thymidine kinase (TK) gene of KHV was reported to be more sensitive than PCR methods described by Gilad et al. (9) and Gray et al. (11), and could detect 10 fg of KHV DNA (2); the PCR of Ishioka et al. (20), based on the DNA polymerase gene, detected 100 fg of KHV DNA. The loop-mediated isothermal amplification (LAMP) method (13) was also based on the KHV TK gene, and was as sensitive as a PCR method developed by the same authors, but was more rapid than the PCR. The PCR described by Gray et al. (11) was improved by Yuasa et al. (40), and has been incorporated in the official Japanese guidelines for the detection of KHV.

New improved diagnostic PCR tests will continue to be developed and it is hoped that they will be validated as recommended in Chapter 1.1.3 of this Aquatic Manual.

The DNA extraction and PCR protocols detailed below for direct detection of KHV in fish tissues are also suitable for confirmatory identification of infected cell culture supernatants.

iii) Diagnostic methods for clinically diseased fish

Direct detection in fish tissues

KHV has been identified in touch imprints of liver, kidney and brain of infected fish by IF. Highest levels of positive immunofluorescence were seen in the kidney and the virus could be detected by IF on a kidney imprint 1 day post-infection (27, 32). Virus antigen has also been detected in infected tissues by an immunoperoxidase staining method. The virus antigen was detected by 2 days post infection in the kidney, and was also observed in the gills and liver (27). However, the detection of KHV by immunostaining must be interpreted with care, as positive staining cells could result from cross-reaction with serologically related virus (e.g. CoHV-1) or a non-viral antigen.

RT-PCR

An RT-PCR method has been described for the detection of KHV in fish tissues, which is even more sensitive than the PCR described above (21). This method involves the extraction of RNA from the tissues, followed by reverse transcription and PCR amplification. The sensitivity of this method is further enhanced by the use of nested PCR, where a second set of primers is used to amplify the product of the first PCR reaction. This method has been used to detect KHV in fish tissues as early as 1 day post-infection, and has been shown to be effective in the detection of the virus in infected cell cultures as well.

Flow cytometry

Flow cytometry is a powerful tool for the detection of KHV in infected fish tissues. The virus can be detected in the nuclei of infected cells by staining with fluorescent antibodies specific for the KHV. This method has been used to detect KHV in fish tissues as early as 2 days post-infection, and has been shown to be more sensitive than IF or RT-PCR.

Electron microscopy

Electron microscopy (EM) is also a useful method for the detection of KHV in infected fish tissues. The virus can be visualized as spherical or ovoid virions with a diameter of 60-80 nm, and can be identified in the cytoplasm of infected cells. EM has been used to detect KHV in fish tissues as early as 1 day post-infection, and has been shown to be effective in the detection of the virus in infected cell cultures as well.

Western blotting

Western blotting is another method that can be used for the detection of KHV in infected fish tissues. The virus can be detected in infected cells by staining with antibodies specific for the KHV, and the identity of the virus can be confirmed by the presence of a specific protein band in the sample. Western blotting has been used to detect KHV in fish tissues as early as 2 days post-infection, and has been shown to be more sensitive than IF or RT-PCR.
4. Rating of tests against purpose of use

The methods currently available for surveillance, detection and diagnosis of KHV are listed in Table 1. The designations used in the table indicate: A = the method is currently the recommended method for reasons of availability, utility and diagnostic sensitivity and specificity; B = the method is a standard method with good diagnostic sensitivity and specificity; C = the method has application in some situations, but cost, accuracy or other factors severely limits its application; D = the method is currently not recommended for this purpose. Although not all of the tests listed as category A or B have undergone formal standardisation and validation (at least stages 1 and 2 of figure 1 of Chapter 1.1.2), their routine nature and the fact that they have been used widely without dubious results makes them acceptable.

**Table 1. KHV surveillance, detection and diagnostic methods**

<table>
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<th>Surveillance to declare freedom from infection</th>
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<td>C</td>
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<td>Transmission EM of tissues</td>
<td>D</td>
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<tr>
<td>PCR of tissue extracts*</td>
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<tr>
<td>PCR – sequence analysis</td>
<td>NA</td>
<td>C</td>
<td>A</td>
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<tr>
<td>Detection of KHV antibodies in exposed fish (ELISA)**</td>
<td>C</td>
<td>C</td>
<td>D</td>
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</table>

IFAT = Indirect fluorescent antibody test; ELISA = enzyme-linked immunosorbent assay; EM = electron microscopy; PCR = polymerase chain reaction.

*Diagnostic virologists should be aware that fish recently vaccinated against KHV may test positive by PCR. No information is currently...
Aquatic Animals Commission is scientifically supported by

23 Designated Experts
in
36 OIE Reference Laboratories
OIE Reference Laboratories are designated to pursue all the scientific and technical problems relating to a named disease on the OIE lists. The role of a Reference Laboratory is to function as a centre of expertise and standardisation of diagnostic techniques for its designated disease. The Expert, responsible to the OIE and its Member Countries with regard to these issues, should be a leading and active researcher helping the Reference Laboratory to provide scientific and technical assistance and expert advice on topics linked to surveillance and control of the disease for which the Reference Laboratory is responsible. They may also provide scientific and technical training for personnel from Member Countries, and coordinate scientific and technical studies in collaboration with other laboratories or organisations (see OIE Mandate and Internal Rules for Reference Laboratories).

1. Diseases of fish

*Epizootic haematopoietic necrosis*

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*Infectious haematopoietic necrosis*

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*Oncorhynchus masou virus disease*
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Viral haemorrhagic septicaemia

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Channel catfish virus disease

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Viral encephalopathy and retinopathy

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Infectious salmon anaemia

Dr B. Dannewig
OIE Reference Laboratories and Designated Experts for aquatic animal diseases

Fish diseases: 14 diseases, 17 laboratories, 14 experts

Mollusc diseases: 11 diseases, 12 laboratories 4 experts

Crustacean diseases: 7 diseases, 7 laboratories, 5 experts

Amphibian diseases: awaiting applications
Dissemination of information via AAC web pages
Aquatic Animals Commission

Latest disease reports: Koi herpesvirus disease, Slovenia (Follow-up report No. 1) Abalone viral ganglioneuritis, Australia (Immediate notification)

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Focus on:
Report of the Aquatic Animals Commission meeting, March 2008

Report of 76th General Session of the OIE International Committee, May 2008 (AAC report is in Fifth Plenary Session)

Databases of aquatic animal diseases
Import risk analysis
National disease contingency plans
## Reports of Commission meetings

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NB: The reports are in the form of large .pdf files that take some time to download. Please be patient.
REPORT OF THE MEETING OF THE OIE
AQUATIC ANIMAL HEALTH STANDARDS COMMISSION
Paris, 3–7 March 2008

The OIE Aquatic Animal Health Standards Commission (hereafter referred to as the Aquatic Animals Commission) met at the OIE Headquarters from 3 to 7 March 2008.

Details of participants and the adopted agenda are given at Annexes I and II.

Dr Eva-Maria Bernoth opened the meeting and welcomed the participants. Dr Sarah Kahn, Head of the OIE International Trade Department, welcomed the Aquatic Animals Commission members on behalf of the Director General who was trading outside France. She noted that the agenda was very long and that a large number of Member comments on the report of the previous meeting (October 2007) had been received. She acknowledged the quality of work of the ad hoc Groups that had met since the last Aquatic Animals Commission meeting.

The Aquatic Animals Commission recognised the contribution of the following Members in providing comments: Australia, Belize, Canada, Chinese Taipei, European Union (EU), Japan, New Zealand, Norway, Peru, the Philippines, Republic of Korea, Saint Lucia, Taiwan, the United Kingdom and the United States.
Adopted Agenda

Welcome from the Director General

Adoption of the Agenda

1. Activities and progress of ad hoc Groups
   1.1. Summary of ad hoc Groups - tasks and meetings
   1.2. Report of the ad hoc Group on the OIE List of Aquatic Animal Diseases - Mollusc Team
   1.3. Report of the ad hoc Group on Aquatic Animal Health Surveillance

2. Aquatic Animal Health Code – Member comments on draft text
   2.1. Disease chapters – general comments
   2.2. Definitions (Chapter 1.1.1.)
   2.3. Diseases listed by the OIE (Chapter 1.2.3.)
   2.4. General obligations (Chapter 1.3.1.)
   2.5. Guidelines for import risk analysis (Chapter 1.4.2.)
   2.6. Recommendations for transport (Chapter 1.5.1.)
   2.7. Infectious myonecrosis (Chapter 2.3.9.) and White tail disease (Chapter 2.3.11.)
   2.8. Infection with Mikrocytos mackini (Chapter 2.2.5.)
   2.9. Gyrodactylosis (Gyrodactylosis salaris) (Chapter 2.1.14.)
   2.10. Infection with Batrachochytrium dendrobatidis (New chapter)
3. **Aquatic Animal Health Code – other items**
   3.1. Horizontal changes in disease chapters
   3.2. Antimicrobial resistance in the field of aquatic animals
   3.3. Crayfish plague (Chapter 2.3.7.)

4. **Joint meeting with the President of the Terrestrial Animal Health Standards Commission**
   4.1. Update on the new structure of the *Terrestrial Code*
   4.2. Compartmentalisation
   4.3. Model veterinary certificates
   4.4. Evaluation of Performance of Veterinary Services (OIE PVS Tool)

5. **Joint meeting with the Publications Department**

6. **The role and activities of the OIE in the field of aquatic animal health**
   6.1. International meetings
      6.1.1. Regional Commission Conferences
      6.1.2. Network of Aquaculture Centres in Asia-Pacific
      6.1.3. OIE/NACA Regional Workshop on Aquatic Animal Health
      6.1.4. Other meetings
   6.2. Cooperation with FAO

7. **Manual of Diagnostic Tests for Aquatic Animals**
   7.1. Progress update on 6th edition of the *Aquatic Manual*
   7.2. Update from the Consultant Editor
   7.3 OIE Procedure for validation and certification of diagnostic assays

8. **OIE Reference Laboratories**
   8.1. Updating the list of OIE Reference Laboratories
2.4. General obligations (Chapter 1.3.1.)

A number of comments were received from Members. The Commission made some changes in line with Member comments.

The updated Chapter on General obligations that will be proposed to the OIE International Committee for adoption at the 76th General Session in May 2008 is presented at Annex V.

2.5. Guidelines for import risk analysis (Chapter 1.4.2.)

New Zealand queried the proposed removal of the reference to spread and establishment of a hazard from the exposure assessment of the risk analysis. The Aquatic Animals Commission clarified that the risk assessment methodology needs to be consistent in the Aquatic and Terrestrial Codes and that spread or establishment of a hazard are understood to form part of the consequence assessment of the risk analysis in the Terrestrial Code. The Aquatic Animals Commission therefore maintains its proposal, which better aligns the two chapters.

The updated Chapter on Guidelines for import risk analysis that will be proposed to the OIE International Committee for adoption at the 76th General Session in May 2008 is presented at Annex VI.

2.6. Recommendations for transport (Chapter 1.5.1.)

Some Members requested clarification on the scope of this chapter. The Aquatic Animals Commission confirmed that the scope of the chapter refers to measures to control the aquatic animal health risks associated with transport of live aquatic animals and aquatic animal products and does not include welfare aspects.

Currently, the guidelines focus on live aquatic animals but, in future, the Aquatic Animals Commission would consider expanding the guidelines to include more detail on aquatic animal products.

The Aquatic Animals Commission clarified that Article 1.5.1.7. refers only to the transport by well boat of live aquatic animals and not of aquatic animal products.

The EU suggested that a chapter be drafted addressing the specific requirements for transport by land. The Aquatic Animals Commission noted that the scope of the current chapter includes transport by land. The words ‘by sea and by air’ were deleted from Article 1.5.1.1. thus clarifying that the chapter covers safe transport by land, sea and air.
Coming soon......
# HANDBOOK ON AQUATIC ANIMAL HEALTH SURVEILLANCE

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- Surveillance versus surveys ........................................................................ 9
- Surveillance versus monitoring .................................................................. 9
- Surveillance methodologies .......................................................................... 10
- Demonstrating the absence of disease or infection .................................... 10
- Determining the occurrence or distribution of endemic disease or infection, including changes to their incidence or prevalence ................................. 11
- Deciding which diseases to subject to surveillance ...................................... 11

## CHAPTER 2 Pathogen transmission in the aquatic environment
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## CHAPTER 3 Populations
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....and much more !
Grazie per l’attenzione!