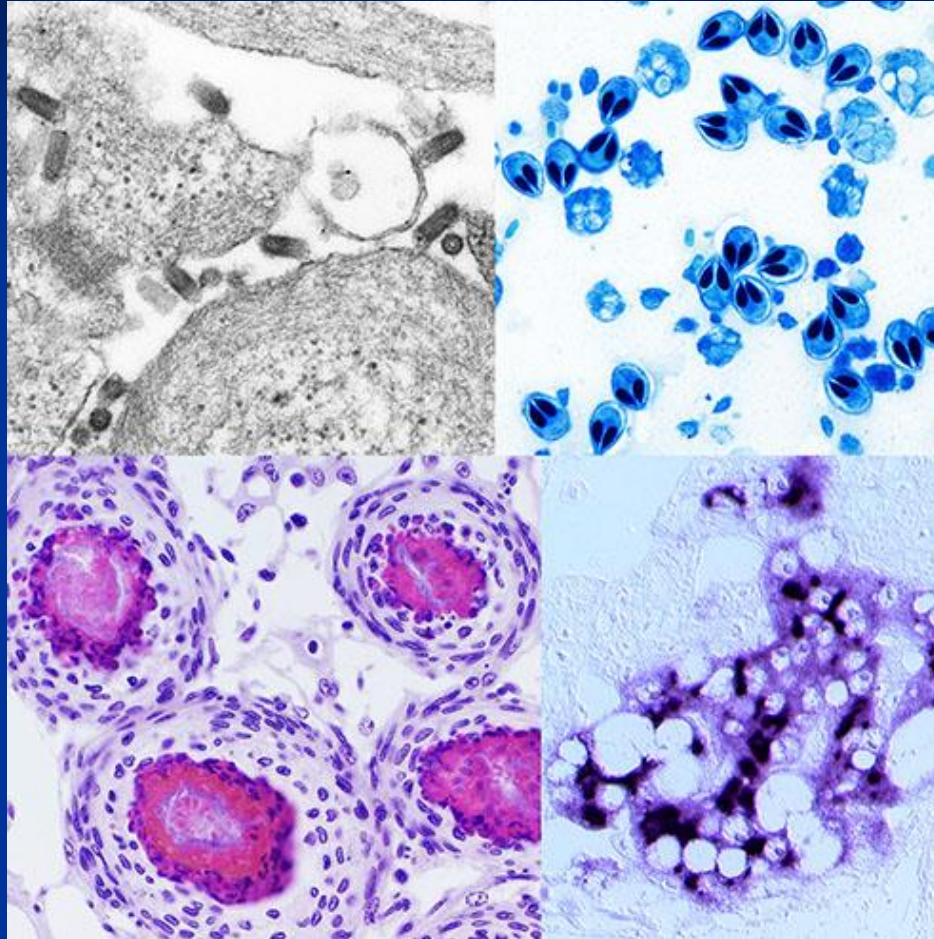


Control of Aquatic Animal Diseases in Japan



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Diagnosis and Training Center for Fish Diseases (n=6)

Development and dissemination of diagnosis techniques for aquatic animals. OIE reference laboratories for KHV and RSIV.

Research Center for Fish Diseases (n=11)

Research and development for pathogens, pathology, treatment, prevention and immunology of aquatic animals

Regulatory authority for the disease control of aquatic animals

Fish and Fishery Products Safety Office

Animal Products Safety Division,
Food Safety and Consumer Affairs Bureau,
Ministry of Agriculture, Forestry and Fisheries (MAFF)

Legal foundations for the control of aquatic animal diseases

Fisheries Resources Protection Act
(import quarantine)

Fish Farming Production Maintaining Act
(disease control within Japan)

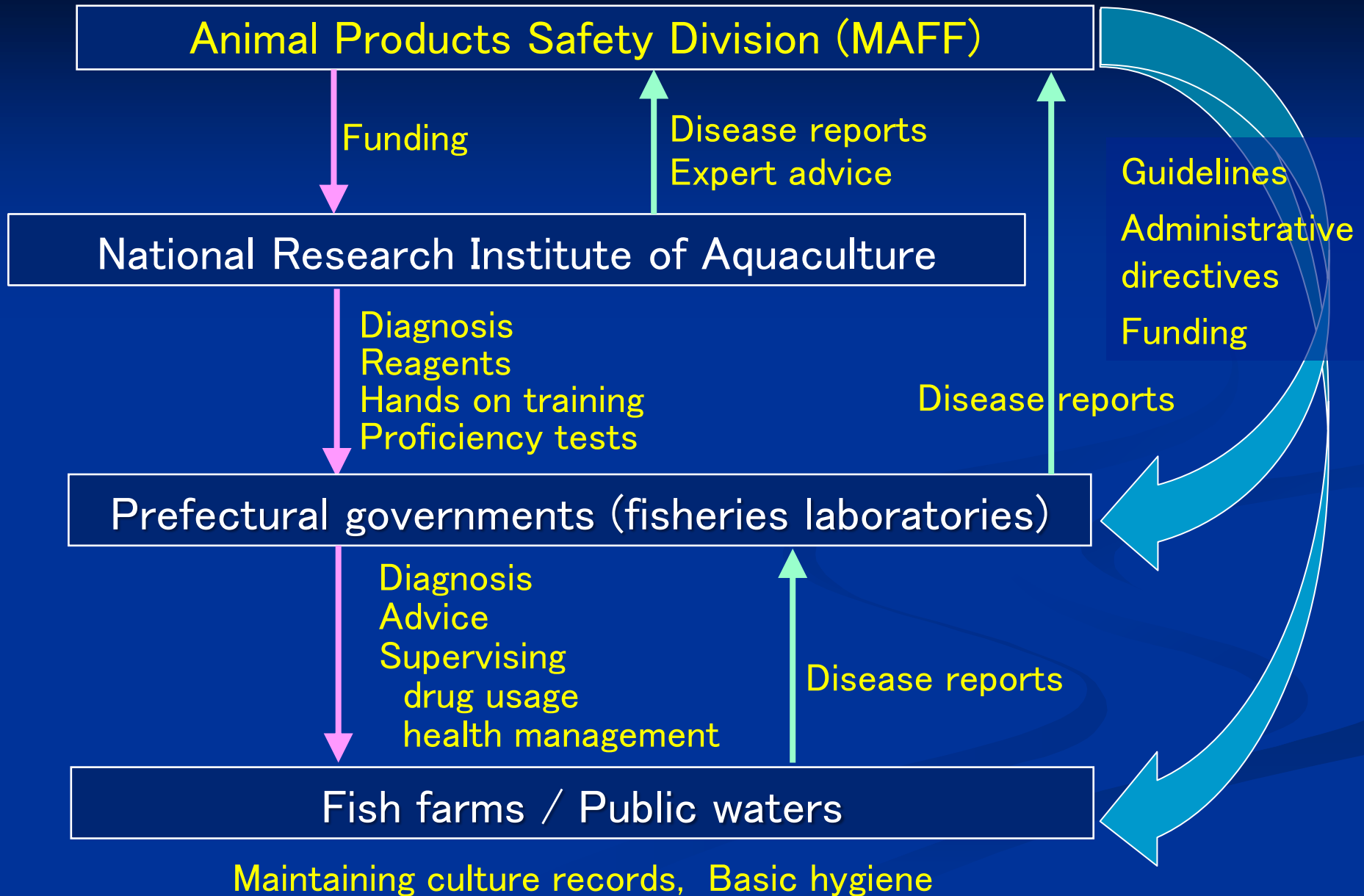
Guideline for Disease Control of Aquatic Animals

specifies roles of different sectors:

- Fish farmers
 - Prefectural governments (local research labs)
 - NRIA
 - Quarantine office
 - MAFF
-
- **Control of specified diseases**
24 diseases (including 11 OIE listed diseases)
 - **Control of emerging diseases**
 - **Control of existing diseases**

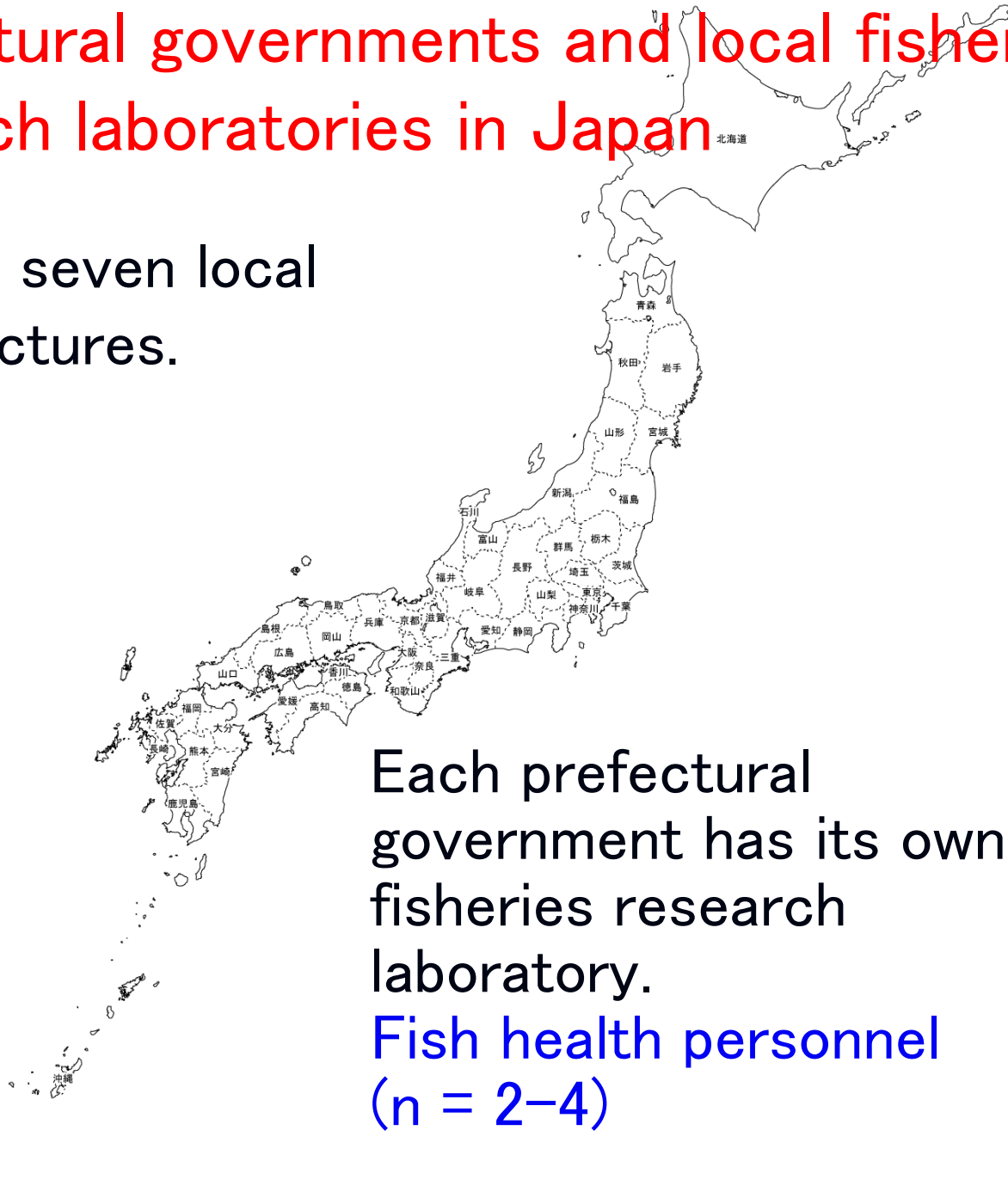
Fish health management

Workflow among relevant sectors



Prefectural governments and local fisheries research laboratories in Japan

Forty seven local prefectures.



Each prefectural government has its own fisheries research laboratory.

Fish health personnel
(n = 2-4)

Roles of prefectural governments and local fisheries research labs

- To visit fish farms periodically
- To gather information (species and numbers of animals cultured, location, movement of animals etc.) about the fish farmers in the prefecture as much as possible
- To gather information about occurrences of diseases
- To educate fish farmers and supervise hygiene management
- To diagnose diseases
- To report occurrences of specified, or emerging diseases to the MAFF and to ask for confirmatory diagnoses to the NRIA
- To take necessary measures to prevent diseases from spreading
- Observation of imported live animals from foreign countries for a specified period in fish farms.

Education of fish health in universities

Fisheries sciences

- Students can learn fish health as a part of the fisheries sciences, but the curriculum is not thorough.
- There are laboratories of some specific subjects of fish health, such as virology or bacteriology depending on the expertise of the P. I.

Veterinary medicine

- Students study mostly about terrestrial animals.
- Fish health is included in the curriculum but it is not thorough.
- Only a limited number of laboratories are dealing with fish health.
- Graduates may obtain the veterinary license if they pass the national exam.

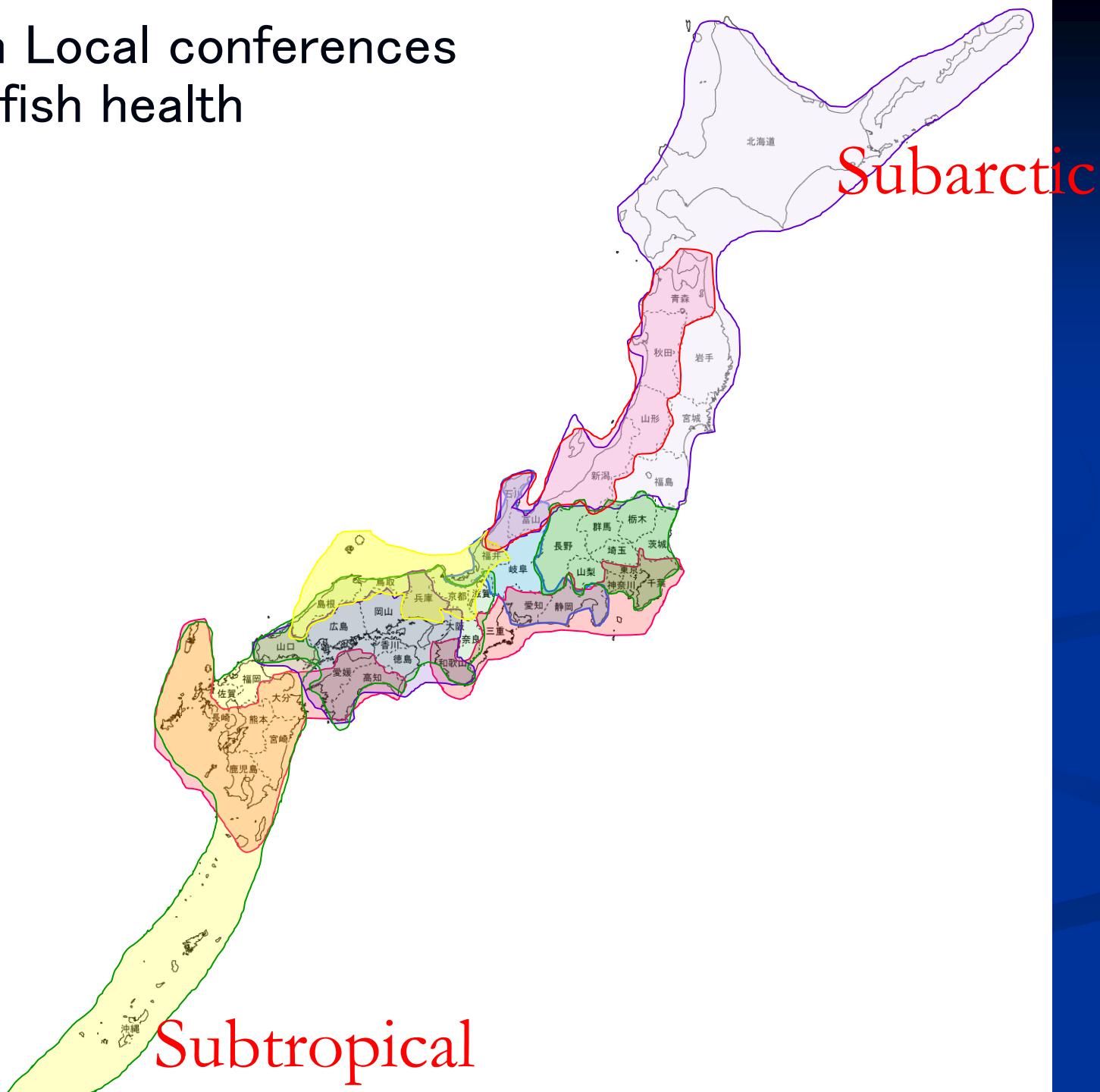
Education of fish health personnel of prefectural fisheries research laboratories

Japan Fisheries Resource Conservation Association provides a comprehensive education course for aquatic animal health.

Basic course	hrs.	Hands on training	hrs.	Expert course	hrs.
Fish farming production maintaining act	1	Bacteriology	12	Immunology	6
The law on pharmaceuticals and medical devices	1	Virology	12	Pathology	6
Food sanitation Act	2	Mycology	10	Physiology	6
Environment of farming	2	Parasitology	10	Nutrition	6
Aquatic animal diseases in general	4	Special lecture I	2	Pharmacology	6
Virology	12	Special lecture II	2	Special lecture	10
Bacteriology	14				
Parasitology	10				
Mycology	6				
Phycology	4				
Total	56		48		40

Examination for “Fish Health Expert”

Ten Local conferences for fish health



The NRIA (Diagnosis and Training Center for Fish Diseases) provides:

- Proficiency tests (KHV, soft tunic syndrome)
- Hands on training on specific subjects
- Diagnostic reagents (positive controls)
- Diagnostic service for “unknown diseases”

to prefectural fisheries research labs.

Diagnostic service for “unknown diseases”

for mortalities that cannot be diagnosed in local fisheries research labs

The animals that have been submitted to the NRIA for diagnosis of “unknown” diseases:

Vertebrates (fin fishes)

Tunicates (ascidians)

Crustaceans (shrimps, crabs, krill)

Mollusks (abalones, oysters, clams, squid)

Echinodermata (sea urchin, sea cucumber, starfish)

Polychetes

Thank you for your attention

Specified diseases by the Japanese government

For fin fishes

1. Viral haemorrhagic septicaemia (except for IVa, OIE listed)
2. Koi herpesvirus disease (OIE listed)
3. Spring viraemia of carp (OIE listed)
4. Piscirickettsiosis
5. Enteric redmouth disease
6. Epizootic haematopoietic necrosis (OIE listed)
7. Salmonid alphavirus disease (OIE listed)
8. Glugeosis of red sea bream
9. Whirling disease

Specified diseases by the Japanese government

For crustaceans

1. Yellowhead disease (OIE listed)
2. Monodon baculovirus disease
3. Tetrahedral baculovirosis
4. Taura syndrome (OIE listed)
5. Infectious hypodermal haematopoietic necrosis
6. Infectious myonecrosis (OIE listed)
7. Infection with gill associated virus
8. Acute hepatopancreatic necrosis disease (OIE listed)
9. Necrotising hepatopancreatitis (OIE listed)
10. Covert mortality syndrome

Specified diseases by the Japanese government

For molluscs and other invertebrates

1. Infection with abalone herpes virus (OIE listed)
2. Pustule disease of abalone
3. Infection with ostreid herpesvirus I (μ Var only)
4. Infection with *Perkinsus qugwadi* in scallop
5. Soft tunic syndrome of tunicate



Health Agreements with Exporting Countries

1. Definition of terms

2. Health requirements for aquatic animals including;

Health management system of the exporting country

Presence of the diseases

Methods of inspection (observation, sampling, tests, etc.)

3. Handling of animals during shipment

4. Inspection certificate

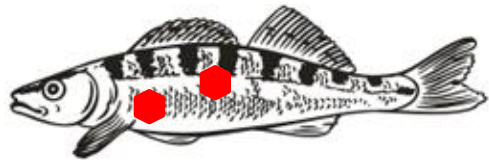
(stating factors 1. and 2. and other general information)

Difficulties in import quarantine of aquatic animals

1. Different animals are cultured in different countries.
2. Harmless parasitic organisms for original hosts sometimes cause devastating damage in related but different species in different countries.
3. It is impossible to quarantine animals for unknown diseases.
4. Import quarantine is allowed only when the pathogen is scientifically confirmed and diagnosis is established (in scientific papers).

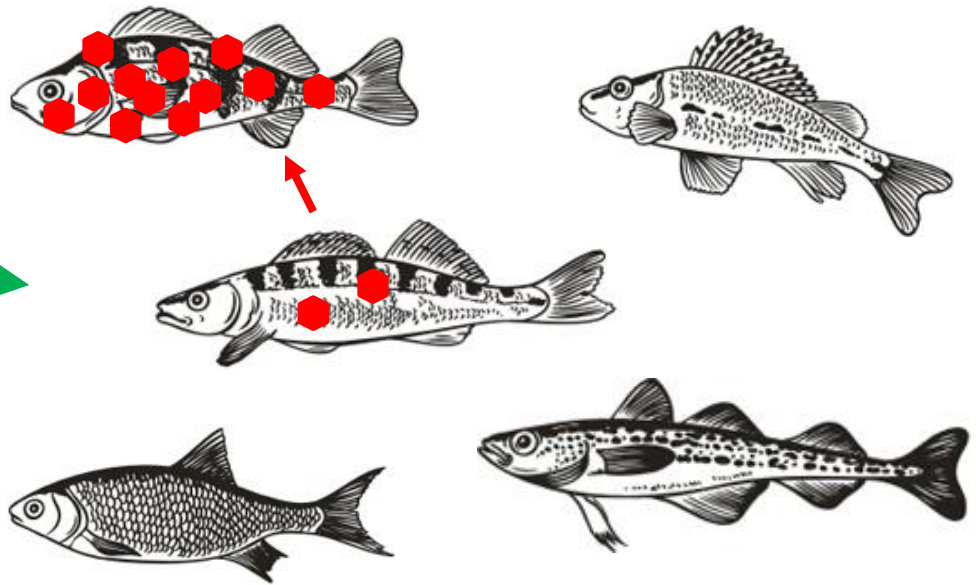
Acquiring new hosts and emergence of disease

Co-evolution of host and parasite



Home

Disease in related species



Different country/region

These pathogens had not been noticed as problems in their (presumed) home countries

- *Xenohaliotis californiensis* (Withering syndrome)

Devastated some abalone species in the U. S. ← No harm to Japanese abalones

- *Neoheterobothrium hirame*

A benign parasite of the Southern flounder (Atlantic ocean) → Decimated a population of the related species in Japanese waters.

- *Myxobolus cerebralis* (Whirling disease)

Weakly pathogenic to brown trout in Europe → Heavy damage to rainbow and cutthroat trout in the mid-western U. S.

- *Perkinsus qugwadi*

Natural host unknown → Caused severe disease problems in imported scallop in Canada