

## Introduction

An emerging disease is defined as a new disease, a new presentation of an old disease (e.g. increased severity or appearance in a new species) or an existing disease that appears in a new geographical area. A significant number of new diseases have emerged globally over the past 20 years and their study has become increasingly important in both human and veterinary medicine. The expansion of aquaculture, which has relied heavily on the movement of animals and farming species new to aquaculture, has been paralleled with disease emergence. Substantial economic and environmental impact has resulted, examples of which include infectious salmon anaemia in Norway and Scotland and white spot virus in shrimp culture throughout Asia and the Americas. In this study, reports of new or emerging diseases have been recorded by routine surveillance of the sources listed in Table 1. Results from October 2002 to the end of December 2003 are presented. Information on each emerging disease report is categorised in Table 2.

**This study details a surveillance programme for emerging fish and shellfish disease worldwide.**

Key to map

Virus	●
Parasite	●
Bacteria	●
Fungus	●
Unknown	○

New diseases are represented by squares

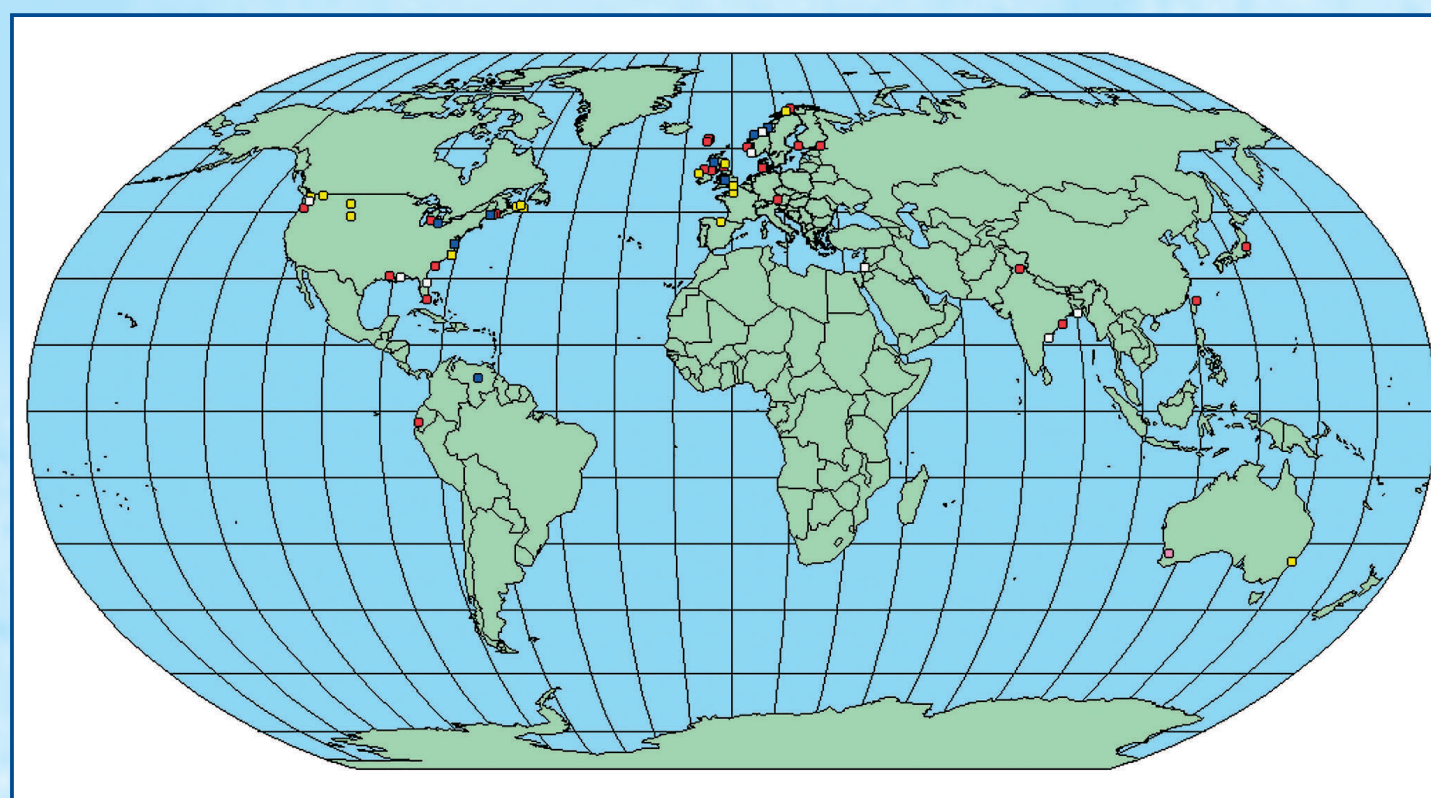


Table 1: Sources

1. Office International des Epizooties (OIE)
2. FAS Program for Monitoring Emerging Diseases (ProMED)
3. IntraFish (Media service)
4. FIS (Media service)
5. Scientific forum on fish and fisheries (Fish-Sci)
6. University of Guelph Plant & Agriculture surveillance archives: (AnimalNet, FS-Net)

Table 2: Pathogen type distributed by emerging disease category

Emerging disease category	Pathogen type					Total
	Virus	Parasite	Bacteria	Unknown	Fungus	
New location	26	11	2	1		40
Non contiguous occurrence	13	3	2	1		19
Contiguous spread	9	7				16
Re-introduction	2					2
Unspecified	2	1				3
New presentation	3	2	2		1	8
New species	1		1			2
Increased severity	2	2	1		1	6
Undiagnosed mortality	1			5		6
New disease		2	4	2		8
<b>Total</b>	<b>30</b>	<b>15</b>	<b>8</b>	<b>8</b>	<b>1</b>	<b>62</b>

## Results and Discussion

- A total of 62 emerging disease incidents, involving 43 different pathogens or unidentified causes, were recorded.
- Events involving viruses and parasites accounted for the large majority of data collected (48% and 24%, respectively). Viruses have been disproportionately found as emerging in human, domestic animal and wildlife populations. These results confirm this observation for emerging diseases in fish.
- The spread of known diseases to new locations was the most important emerging disease category (60%). Contiguous and non-contiguous spread were equally important and investigation of the routes of transmission might inform the development of strategies to minimise the spread of emerging diseases.
- Eight completely novel diseases were reported, and two known diseases were found in new species. Further investigation of the origin of new diseases might help elucidate the processes underlying emergence.
- Emerging disease events occurred mainly in salmonid species (45%), farmed populations (65%) and in Europe and North America (82%).
- There were no reports from some regions with significant aquaculture production which might be due to under-reporting of emerging diseases.

## Conclusions

- It is important that systems exist to monitor and investigate the occurrence of emerging diseases and, when necessary, rapidly introduce measures to minimise global spread.
- The information collected during the first year of monitoring provided a useful first stage of screening for emerging fish diseases that may be potential threats to the UK. In the future the database will provide a resource for investigating long-term trends in disease emergence and the processes underlying emergence.

## Acknowledgements

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