



The surveillance programme for viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN) in Norway 2020



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Summary

This surveillance programme has a risk-based approach. The core surveillance activity is the routine clinical inspections on sites with farmed salmonids and analyses of samples collected from diseased fish. Samples from pink salmon caught in one river were also included. Viral haemorrhagic septicaemia virus and infectious haematopoietic necrosis virus were not detected at any of the sites tested in the 2020.

Introduction

Viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN) are two important diseases in salmonid fish caused by rhabdovirus infections (1).

VHS has most frequently been recorded in farmed rainbow trout, but may also cause losses in other wild and farmed fish species, both marine and freshwater (2, 3). Norway obtained disease free status for VHS and IHN in 1994 (4). VHS was diagnosed in farmed rainbow trout in Norway in 2007, and the disease free status for the established containment area was temporarily suspended (5, 6). Measures to eliminate the disease and prevent its spread were immediately taken by the Norwegian Food Safety Authority (NFSA). In 2011, the relevant fjord regained its free status.

Outbreaks of IHN have resulted in significant economic losses in farmed rainbow trout and salmon in North America and Europe, and the disease has also had an impact on wild populations of Pacific salmon (7). IHN was detected for the first time in Finland in 2017 and in Estonia in 2018. The disease has never been diagnosed in Norway.

The Norwegian Veterinary Institute (NVI) coordinates the surveillance programme and publishes the overall results in annual reports available on www.vetinst.no/overvaking/virusykdommer-vhs-ihn-fisk. All fish samples were analysed at the NVI. The NFSA was continuously updated on the test results at site level through a digital data sharing portal (the EOS-portal).

Aims

The aim of the programme is to document the absence of VHS virus (VHSV) and IHN virus (IHNV) in farmed salmonids.

Materials and methods

The surveillance programme has a risk-based approach (8), where the core surveillance activity is the routine clinical inspections on sites with farmed salmonids carried out by the fish health services (FHS) and laboratory investigation of suspicious samples. The FHS are performing health controls based on the risk of infections, stress and increased mortality (9).

In addition, the NFSA sampled sites with farmed rainbow trout to increase the number of samples from this species. Furthermore, fry of wild pink salmon (*Oncorhynchus gorbuscha*) from the river Vestre Jakobselv in the northernmost county of Norway (Troms og Finnmark) were included. Additionally, samples from lumpfish (*Cyclopterus lumpus*), Goldsinny wrasse (*Ctenolabrus rupestris*) and Ballan wrasse (*Labrus bergylta*) used as cleaner fish for biological delousing at sites with farmed salmonids were examined.

Samples on RNAlater™ or transport medium submitted to the NVI were processed and analysed for VHSV and IHNV by real-time RT-PCR with VHSV primers and probe from Jonstrup *et al.* 2013 and IHNV primers and probe modified from Liu *et al.* 2008, respectively (10, 11).

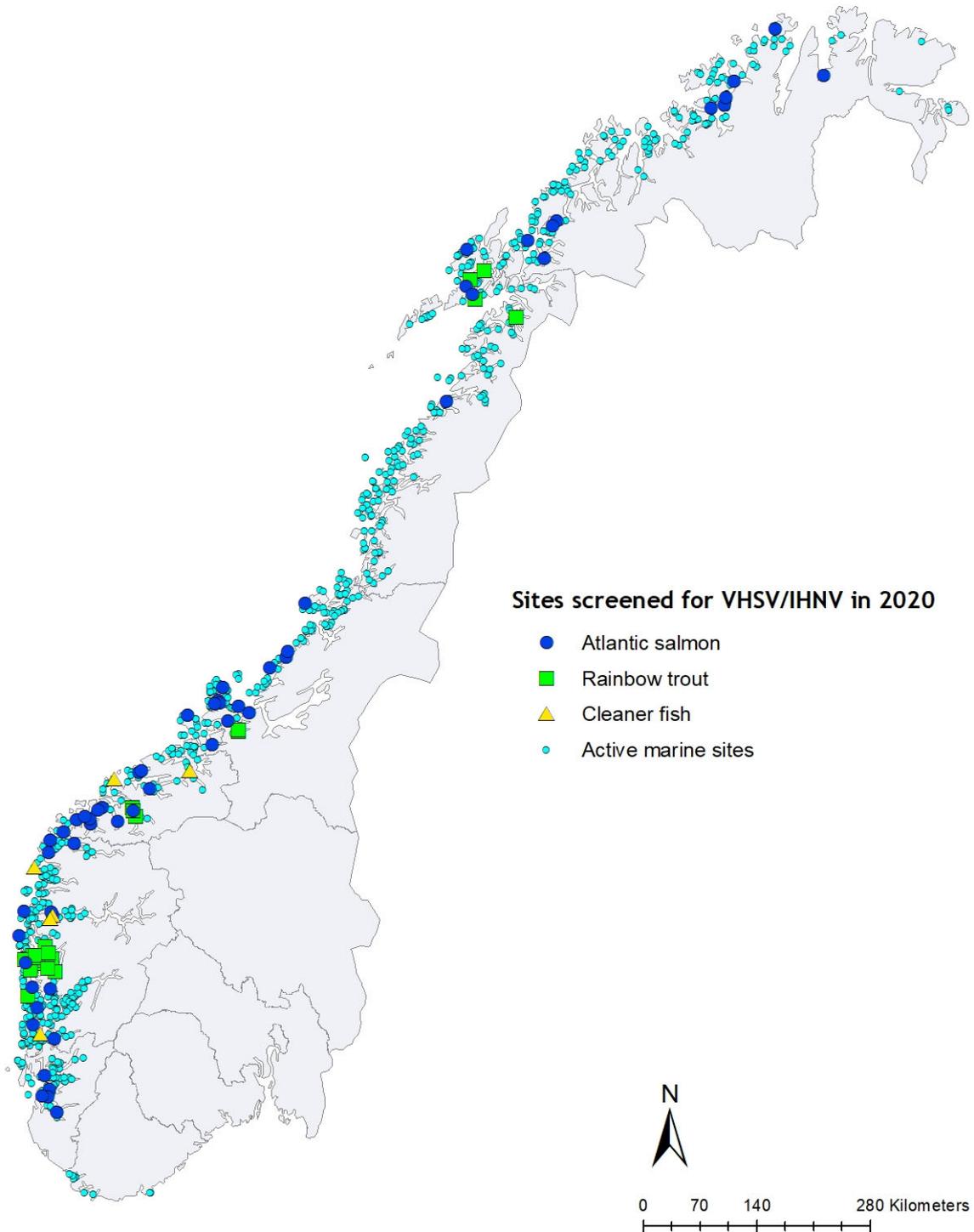
Results and Discussion

In total, 294 samples from Atlantic salmon at 58 sites, 196 samples from rainbow trout at 23 sites and 29 samples from cleaner fish at six sites were tested for VHSV and IHNV in 2020 (Figure 1). In addition, 15 samples from pink salmon in one river in the very north of Norway were tested for both viruses. VHSV and IHNV were not detected in any of the samples.

The performance of the routine clinical inspections in surveillance for freedom from VHS was evaluated in 2016, using a stochastic simulation model (12). Model results indicate that the current surveillance system, based on routine inspections by the FHS, has a high capability for detecting VHS, and that there is a high probability of freedom from VHS in Norwegian marine farmed salmonids (PFree >95%). Sensitivity analysis identified the probabilities that samples are submitted and submitted samples are tested, as the most influential input variables. The model provides a surveillance platform for similar exotic viral infectious diseases in marine salmonid farming in Norway, if they share similar risk factors, e.g. IHN.

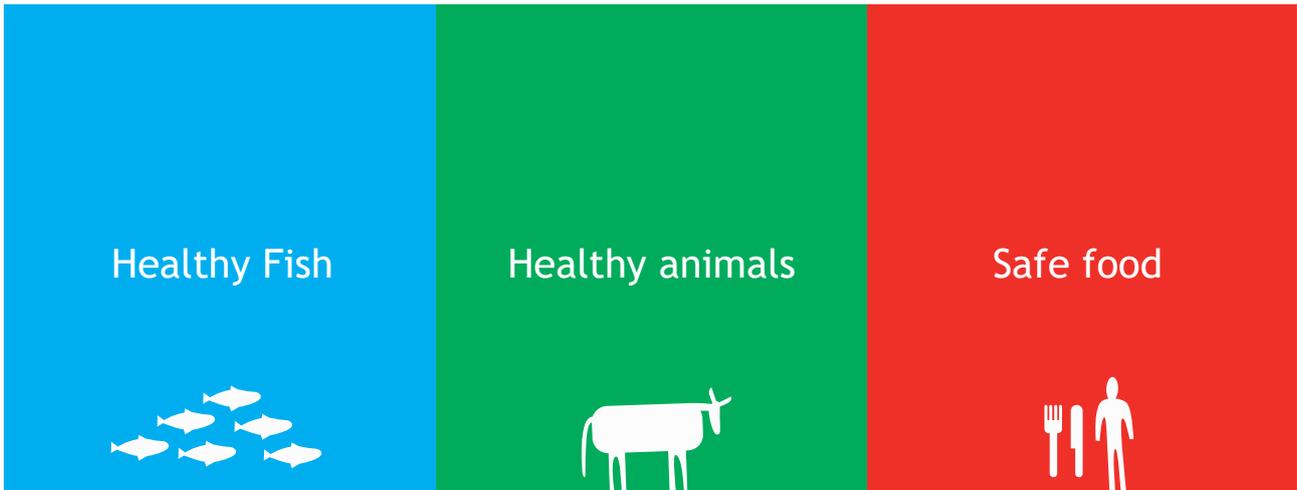
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Figure 1: Sites screened for VHSV/IHNV in 2020. All marine sites with Atlantic salmon or rainbow trout that have been active for at least three months are also marked. Courtesy to Attila Tarpai.



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