

The surveillance programme for viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN) in Norway 2016



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Authors

Anne-Gerd Gjevre, Ingebjørg Modahl, Trude Lyngstad

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Summary

This surveillance programme has a risk-based approach. The core surveillance activity was the routine clinical inspections on farmed salmonid sites and analyses of samples collected from diseased fish. Viral haemorrhagic septicaemia virus and infectious haematopoietic necrosis virus was not detected at any of the sites tested in the 2016 surveillance.

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 disease free status 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 Norway regained its VHS 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. IHN has never been diagnosed in Norway.

The Norwegian Veterinary Institute (NVI) coordinates the surveillance programme and publishes the overall results in monthly and annual reports available on the NVI website (www.vetinst.no). In 2016 all fish samples were analysed at the NVI.

Aims

The aim of the programme is to document the absence of VHS virus (VHSV) and IHN virus (IHNV) in farmed salmonides in order to maintain Norway's VHS and IHN free status.

Materials and methods

The surveillance programme has a risk-based approach (7), where the core surveillance activity was the routine clinical inspections on farmed salmonid sites carried out by the fish health services (FHS) and laboratory investigation of suspicious samples. Sites with farmed salmonids are inspected by FHS at least six times a year in a normal situation. Additional inspections may be required at the time of sea transfer of smolt and in cases of increased mortality or suspicion of disease. The routine inspections should be spread approximately equally throughout the year (8).

In 2016, the surveillance programme for VHS included laboratory investigation of relevant samples from active sites with both rainbow trout and salmon. Additionally, samples from a few individuals of marine species like pollock, lumpfish, wrasse and cod were included. The programme for IHN was focused on samples from sites with salmon. The samples were submitted by the FHS in connection with disease investigation or the NFSA in connection with inspections on sites with rainbow trout targeting moribund or newly dead fish. An active site was defined as having stocked fish for at least three months of the year. In 2016, 63 marine sites with rainbow trout and 706 marine sites with Atlantic salmon were registered as active. These numbers are based on monthly reports on production statistics to the Norwegian Authorities, biomass data obtained as described in Kristoffersen et al 2009 (9). Active freshwater sites are not included in these numbers (data not available).

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

Results and Discussion

In total, 581 fish samples from 37 of the sites with rainbow trout and 45 of the sites with Atlantic salmon were tested for VHSV in 2016. Additionally, 29 samples from one sites with lumpfish, one site with wrasse, one site with pollock and cod were tested. All samples were negative (Figure 1, 2).

Of the fish samples included in the VHSV surveillance programme, 354 were from the rainbow trout and 227 were from the Atlantic salmon. The mean number of samples per site was 9 and 5 for rainbow trout and Atlantic salmon sites, respectively.

In total, 216 fish samples from 42 sites with Atlantic salmon were tested for IHN in 2016. All samples were negative (Figure 1, 2). The mean number of samples per site was 5.

Neither VHSV- nor IHN-positive salmonids were detected during the risk based surveillance programme in 2016.

The performance of the routine clinical inspections in surveillance for freedom from VHS was evaluated using a stochastic simulation model (12). The system has been running in Norway for many years and provides a high probability of freedom from VHS (Probability of freedom > 95 %).

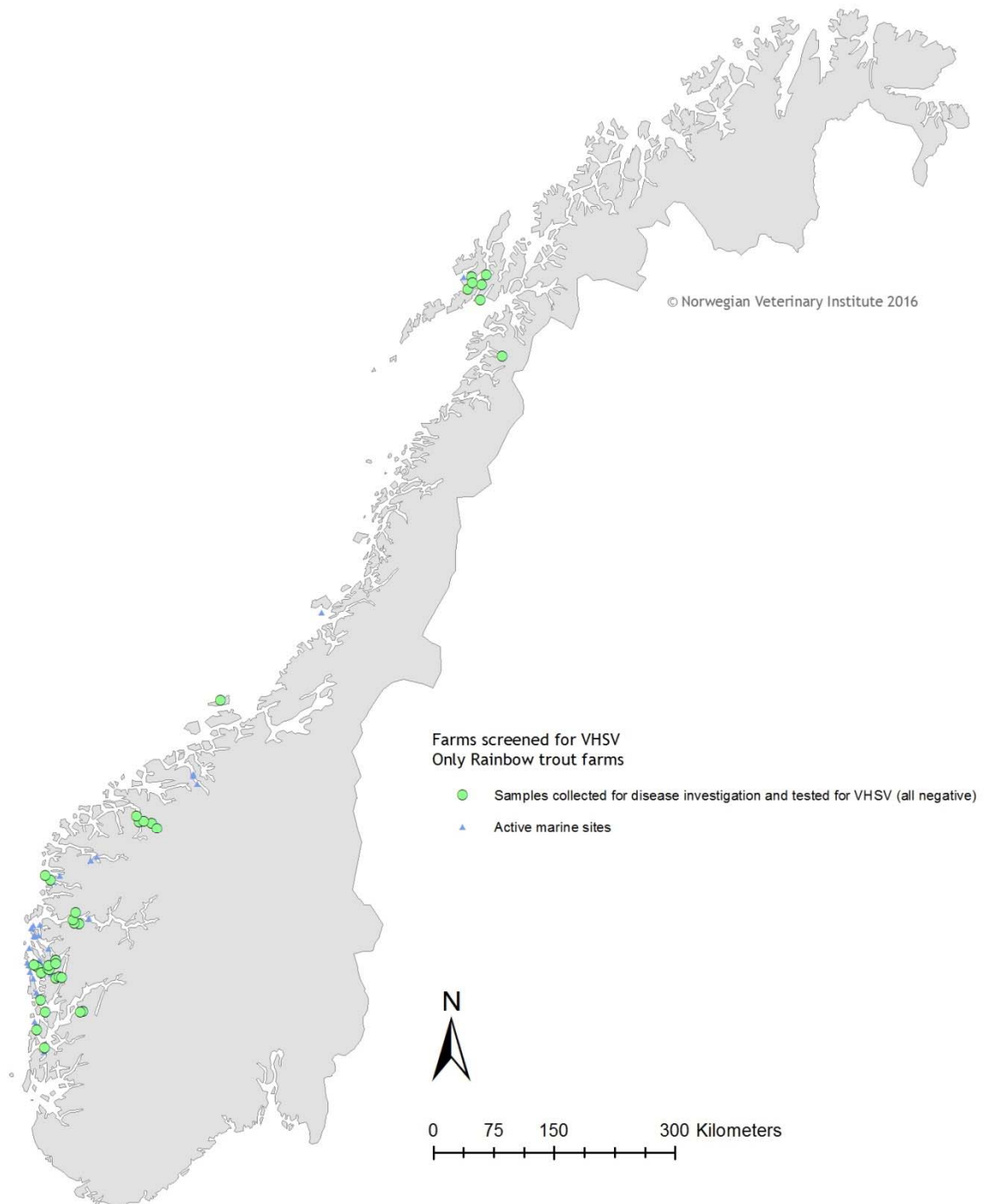


Figure 1. Map of active marine sites with rainbow trout in 2016. Active freshwater sites are not shown (data not available). Green and blue circle symbols indicate sites included in the 2016 surveillance programme.

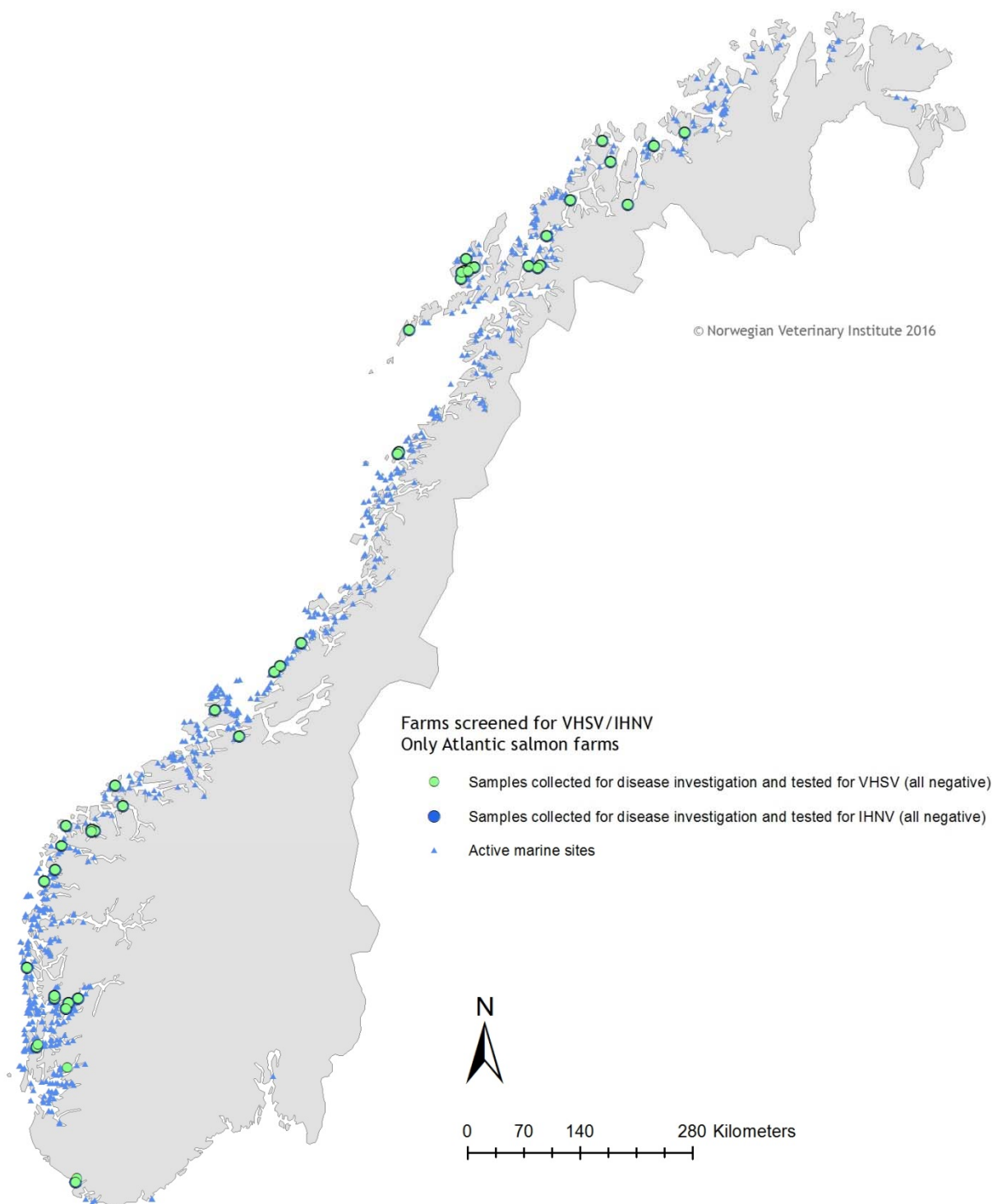


Figure 2. Map of active marine sites with Atlantic salmon in 2016. Active freshwater sites are not shown (data not available). Green and blue circle symbols indicate sites included in the 2016 surveillance programme for VHS and IHN.

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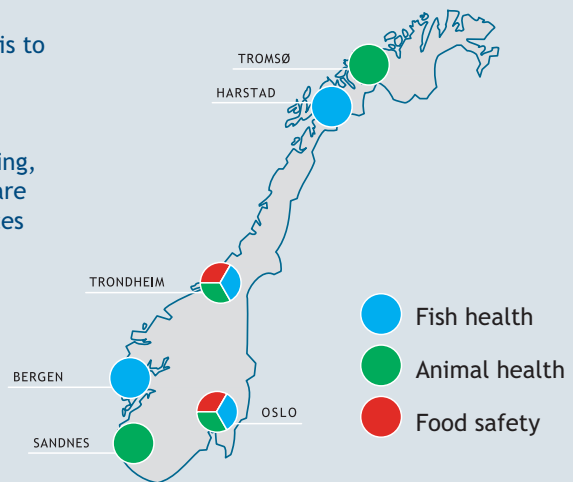
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