

Operational delousing intensity as a predictor of Pancreas Disease



Authors: Malin Falk, Kamilla Eggen, Thea Willoch Rettedal, Camilla Strøm, Torbjørn Fosså, Sondre Kvivik



Introduction

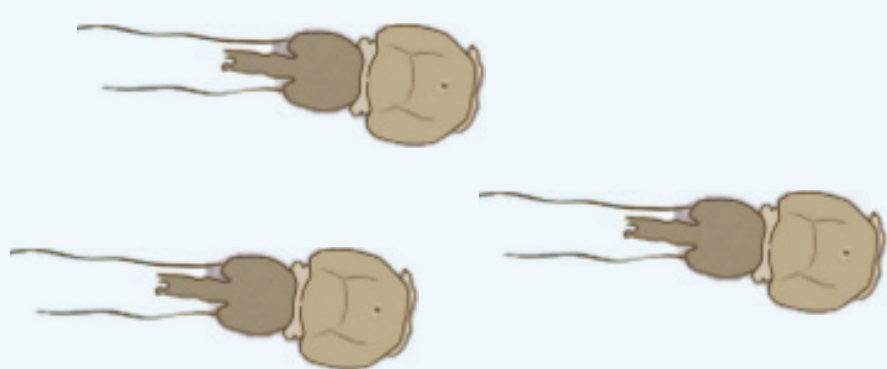
Pancreas disease (PD) is a major threat to Atlantic salmon (*Salmo salar*) aquaculture, causing reduced growth and increased mortality. Despite widespread vaccination, PD remains endemic in Norway.

Frequent delousing exposes fish to handling, temperature shifts and crowding, leading to physiological stress and impaired immune function.

This study investigates whether the frequency of delousing operations is associated with a higher probability of PD outbreaks in Norwegian aquaculture.

H₀: No correlation between frequent delousing operations and PD diagnosis.

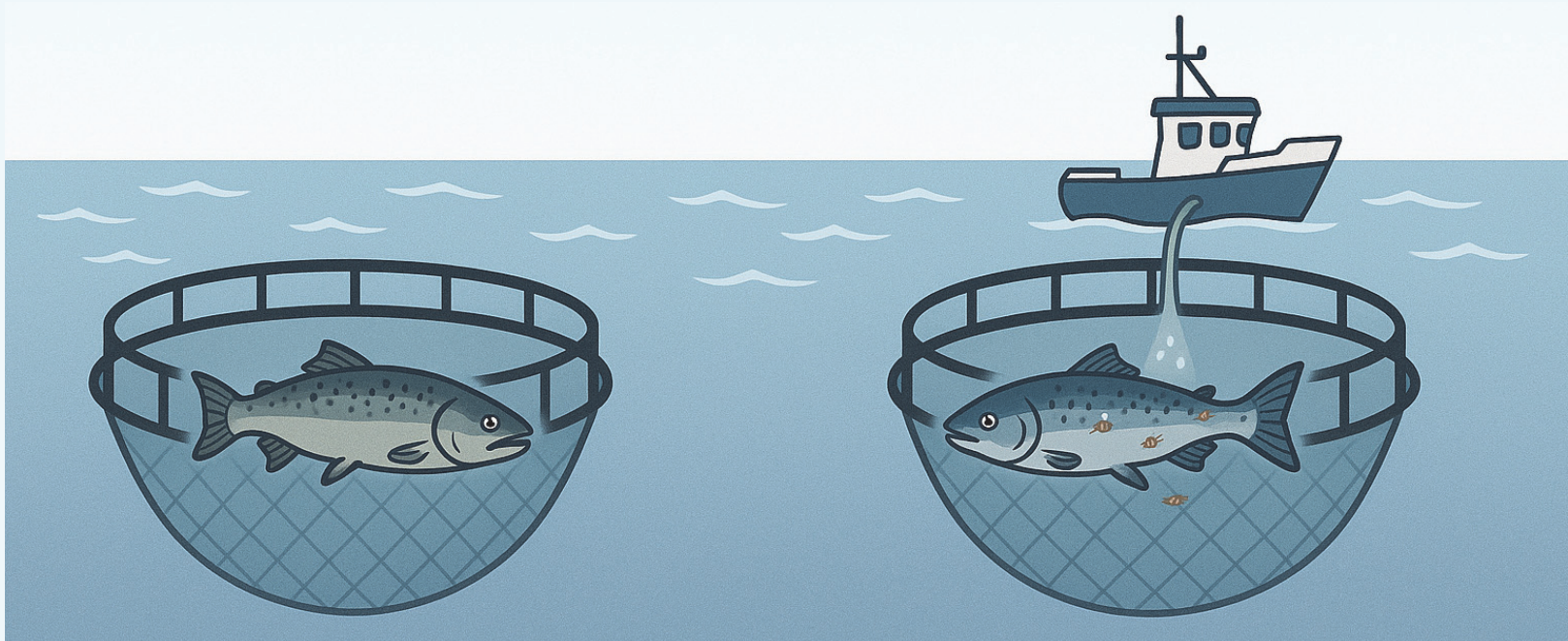
H: Correlation between frequent delousing operations and PD diagnosis.



Methodology

Data from Norwegian Atlantic salmon farms (2024) were obtained from the open-access Barentswatch database, including records of PD detections and sea lice treatments.

Twenty PD-positive sites were paired with nearby non-PD control sites (<10km) with comparable environmental parameters.



Treatment intensity was calculated as the cumulative proportion of cages treated per site during 2024. A binomial GLM with a logit link was used to assess the association between treatment intensity and PD occurrence.

Results

The results show a clear positive association: each unit increase in treatment intensity raised PD odds by ~31%, with PD probability rising from about 25% at low-treatment sites to over 70% at high-treatment sites.

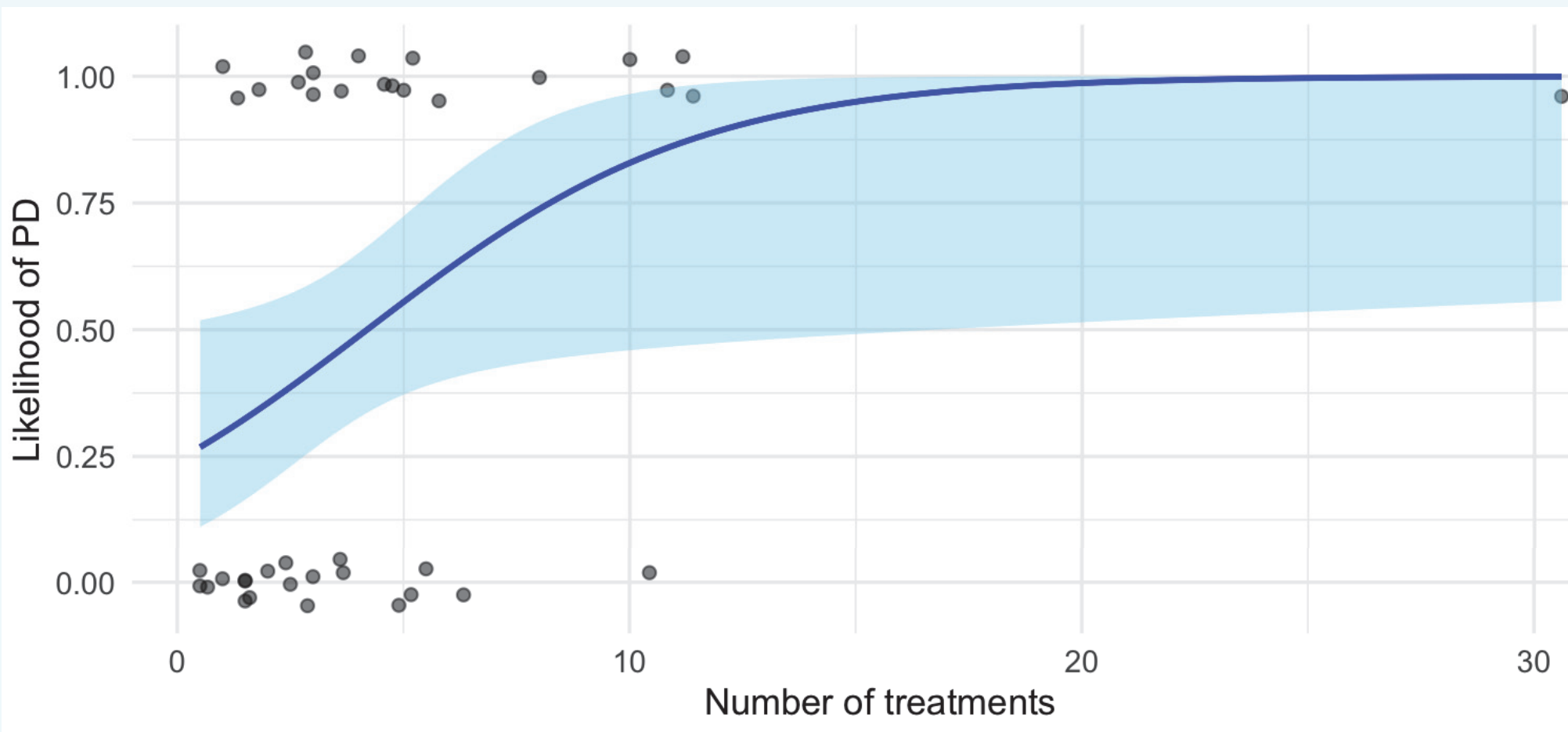


Figure 1: Relationship between treatment intensity and PD probability in Norwegian salmon farms (n=40, 2024). Blue line shows the fitted logistic model with 95% CI.



Figure 2: Map over Norway showing positioning of location pairs

Conclusion

In conclusion, treatment intensity is clearly correlated with PD occurrence, leading to rejection of the null hypothesis.

References

Modal, T., Wiik-Nielsen, J., Oliveira, V. H. S. de, Svendsen, J. C., Haukaas, A., & Sommerset, I. (2025). Norwegian Fish Health Report 2024 (No. #1b/2025; Norwegian Veterinary Institute Report series). The Norwegian Veterinary Institute. <https://www.vetinst.no/rapporter-og-publikasjoner/rapporter/2025/norwegian-fish-health-report-2024>

BarentsWatch. (n.d). *Fish health data*. <https://www.barentswatch.no/data/fishhealth>