

NoroRisk: A quantitative risk assessment model to estimate the risk of oyster related Norovirus illness.

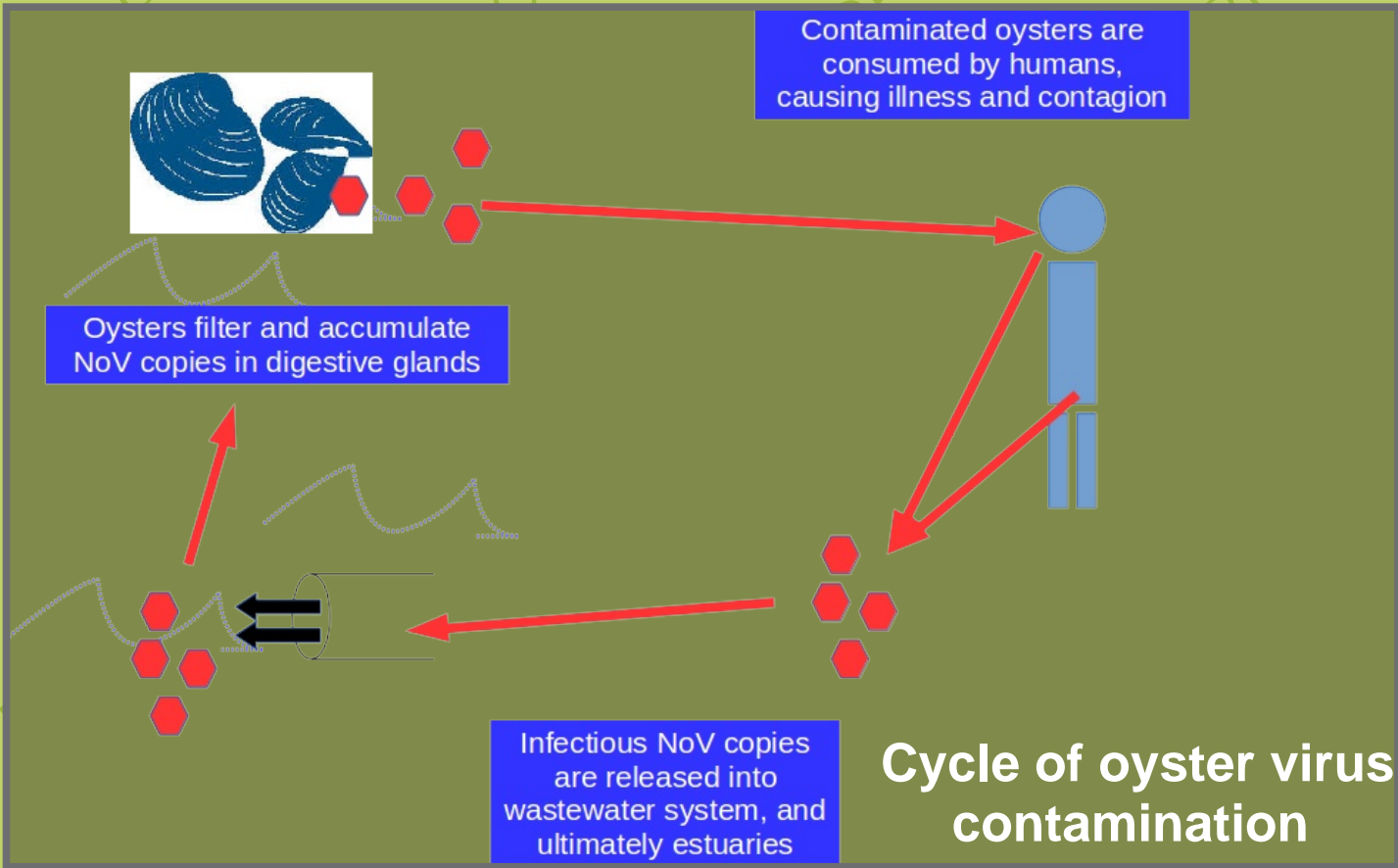
Kevin Hunt^{1,2}, Bill Dore², Sinead Keaveney², & Francis Butler¹

¹University College Dublin, Belfield, Dublin 4, Ireland

²Marine Institute, Rinville, Oranmore, Galway, Ireland

1. Introduction to the project

- Oysters are sessile bivalve molluscs, and feed by filtering hundreds of litres of sea-water every day. If there is environmental exposure to wastewater or sewage discharges, human pathogens can lodge and accumulate in the oyster flesh. Gastroenteritis is a major public health risk associated with this contamination, chiefly caused by Norovirus (NoV).
- A standardised method for detecting and quantifying NoV in oysters has only recently been developed. It shows high concentrations spread across Europe, which existing food safety standards are inadequate to mitigate. No new standards have been introduced to deal with this issue, due to lack of data on the risk of NoV related illness from consumption of contaminated oysters.
- The NoroRisk project aims to use the standard detection method to develop a new risk assessment model for oyster NoV related illness. This will help the introduction of acceptable standard limits of NoV concentration, and the assessment of methods for NoV reduction.



2. The NORORISK team

- This project is a joint collaboration between the Marine Institute and UCD.
- The Marine Institute Shellfish Safety department is an ISO 17025 accredited testing and research body. It is the National Reference Laboratory for shellfish microbiology in Ireland. It actively engages with and develops safety standards for the shellfish industry, on a national and EU level.
- Research at the UCD School of Biosystems Engineering includes work on food engineering, most relevantly quantitative risk assessment of microbiological hazards and food chain integrity.
- I am a postgraduate student with UCD. After completing a modest pilot study, my research focus in this project will be the development of two quantitative assessment models for NoV in oysters, based on ongoing monitoring data: (1) an exposure assessment model for NoV, and (2) an overall risk assessment model.



Figure 2: Project partners

3. Specific aims and methods

- The main aims of this project are as follows:
- (1) A model to estimate the risk of illness associated with NoV contaminated oysters, as quantified by the standard detection method.
- (2) Quantification and optimisation of risk management strategies. This will incorporate ways of reducing NoV levels, as well as strategies to reduce exposure to already high levels.
- This work will involve a mix of laboratory studies and references to existing databases and studies.

No.	Objective	Responsible
1	Monitoring of NoV in oyster production site	Marine Institute
2	NoV purification studies	Marine Institute
3	Exposure assessment model	UCD / Kevin Hunt
4	Risk assessment model	UCD / Kevin Hunt
5	Dissemination	All

Table 1: Project objectives, with postgraduate responsibilities highlighted

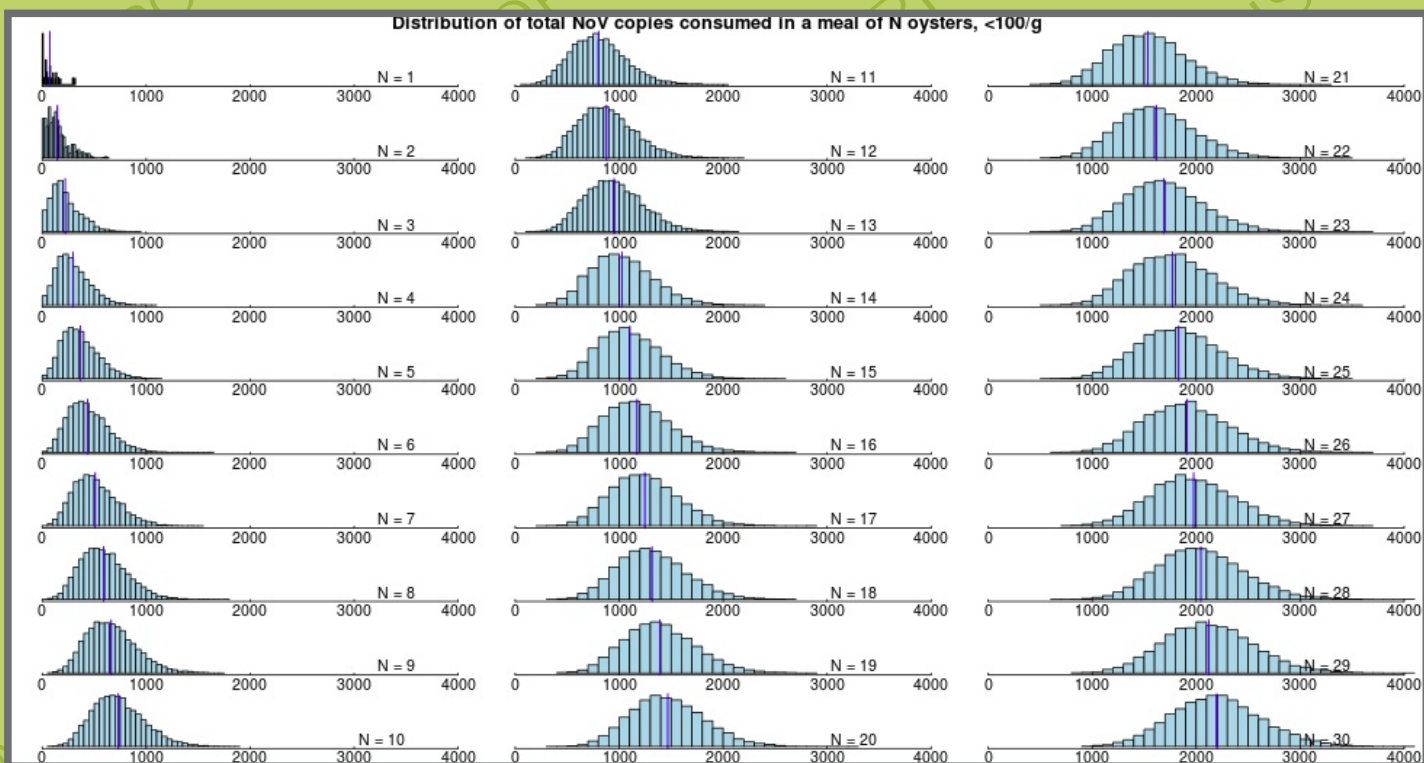


Figure 3: Simulated meal sizes showing distribution of total NoV genome copies consumed per meal size.. Further analysis of this sort will contribute to an Exposure Assessment model

4. Early results, and references

- Some preliminary work on the exposure assessment model has already been completed. This work had three aims:
- (1) To assess how NoV is distributed across different oysters, and how that affects our ability to estimate levels.
- (2) To assess how NoV is distributed across an entire site
- (3) To assess the implied consumer exposure to NoV based on the results of (1) and (2).

5. Acknowledgments

With the support of the Erasmus+ programme of the European Union, Project No: 2014-1-MT01-KA200-000327

