



Food and Agriculture
Organization of the
United Nations

Vaccines as prevention strategy and alternative to antimicrobials

Edgar Brun¹ and Saraya Tavoranpanich²

¹ Director Aquatic Animal Health and Welfare

² Senior researcher and International coordinator on aquatic animal health

Norwegian Veterinary Institute



FAO COFI Webinar “**Innovative biosecurity approaches for a healthier aquaculture industry**”

15 July 2020

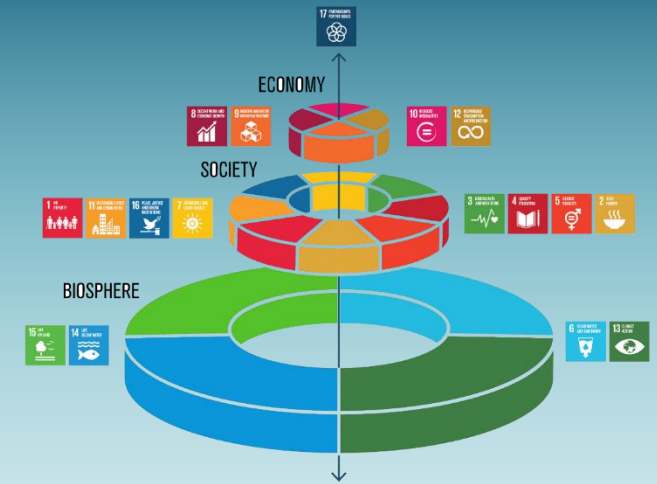
Use of antibiotics depends on

- Species farmed
- Governance and regulations
- Extent of technical services available
- Availability of effective vaccines against the most dominant diseases

Country	Estimated antimicrobial use (g per tonne production)
Norway	1
Sweden	2
Greece	100
Canada (British Columbia)	153
Chile	200
Vietnam	700

Biosecurity and sustainability

- Vaccines are an integrated part of biosecurity
- Vaccines have been essential for a successful controlling devastating bacterial diseases (1st and 2nd generation vaccines) in finfish production
 - Attenuated, inactivated agents incl. adjuvants
 - Less efficient vaccines for viral diseases
- Biosecurity measures aims for a healthy, sustainable animal production
 - Total load of infections
 - Understanding the importance of environmental flora (incl mucus and gut flora)
- Routine dependency on antimicrobials is in the long run not sustainable



Challenges in vaccine availability

- Vaccine effectiveness
 - Public –private –partnership to encourage vaccine development
- Procedures for temporary licensing of vaccines
- Procedures for application of vaccines

Challenges in delivery systems

- Immersion



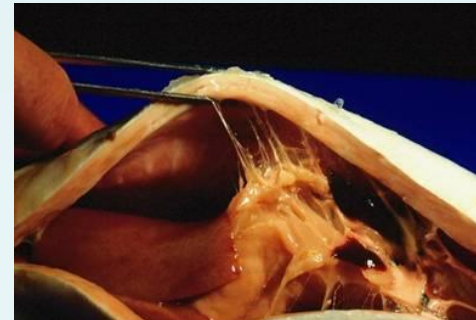
- Injection (i.p., i.m.)



- Oral



Algae based platform for oral delivery of drugs and vaccines (TransAlgae)



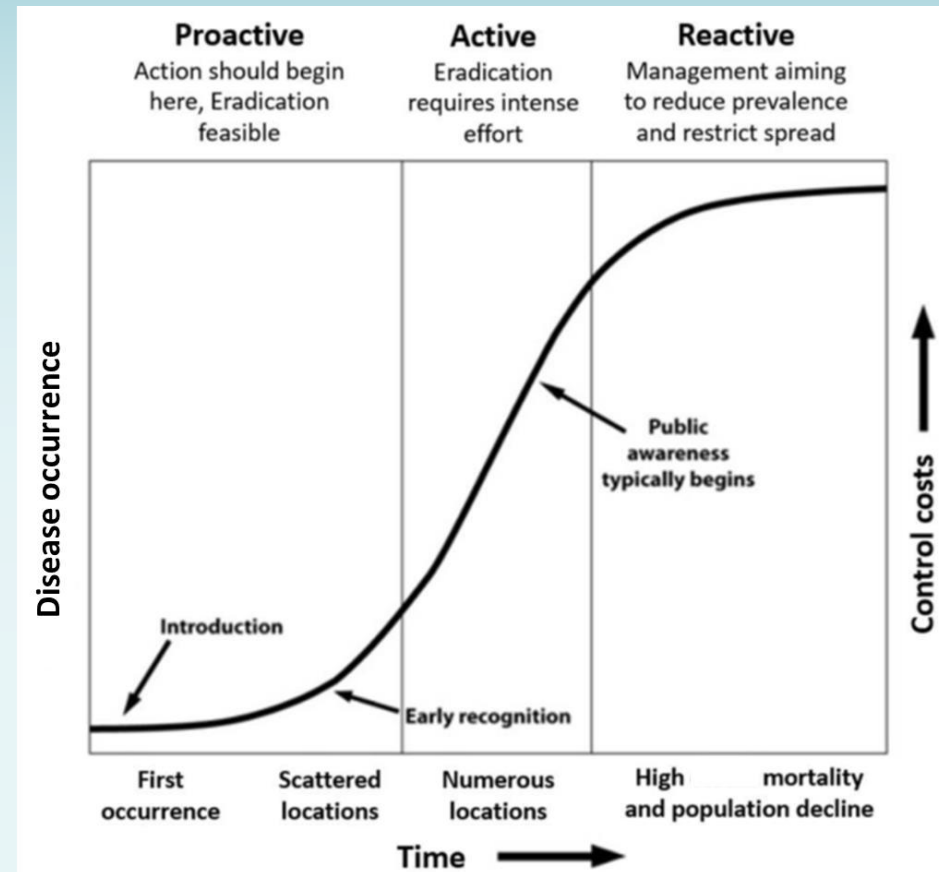
Challenges in cost

- Developing vaccines is costly
 - Vaccine cost per fish assumed too high
 - Antibiotics are cheap and easy accessible
- Use of autogenous vaccines
- Lack of cost- benefit analyses

	PD- vaccinated	Non- vaccinated
Mortality - %	15.0	22.5
Growth - % /day	0.75	0.72
Discarded at slaughter	1.28	2.74

Way forward

- Implementation of biosecurity measures incl. vaccines, is an essential part of fish health management standards (reduce load of infection).
- Improve standards for prudent use of antibiotics needed
- Improve knowledge of microbiota
- Improve knowledge on cost of diseases
- New vaccine platforms available
 - 3rd generation vaccines (DNA vaccines)
 - Less side effects



Thank you for listening