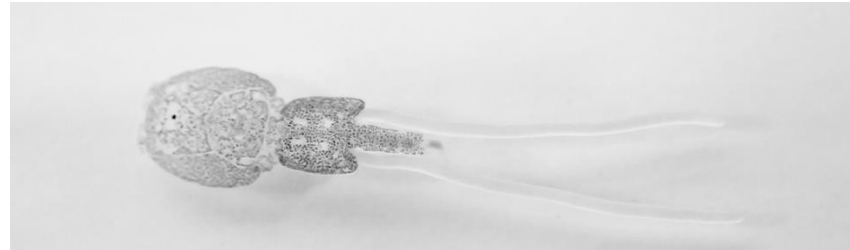


# Luseåret 2019: Behandlinger og resistens



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Veterinærinstituttet

FHF Lusekonferansen, Trondheim, 21.01.20



**Veterinærinstituttet**  
Norwegian Veterinary Institute



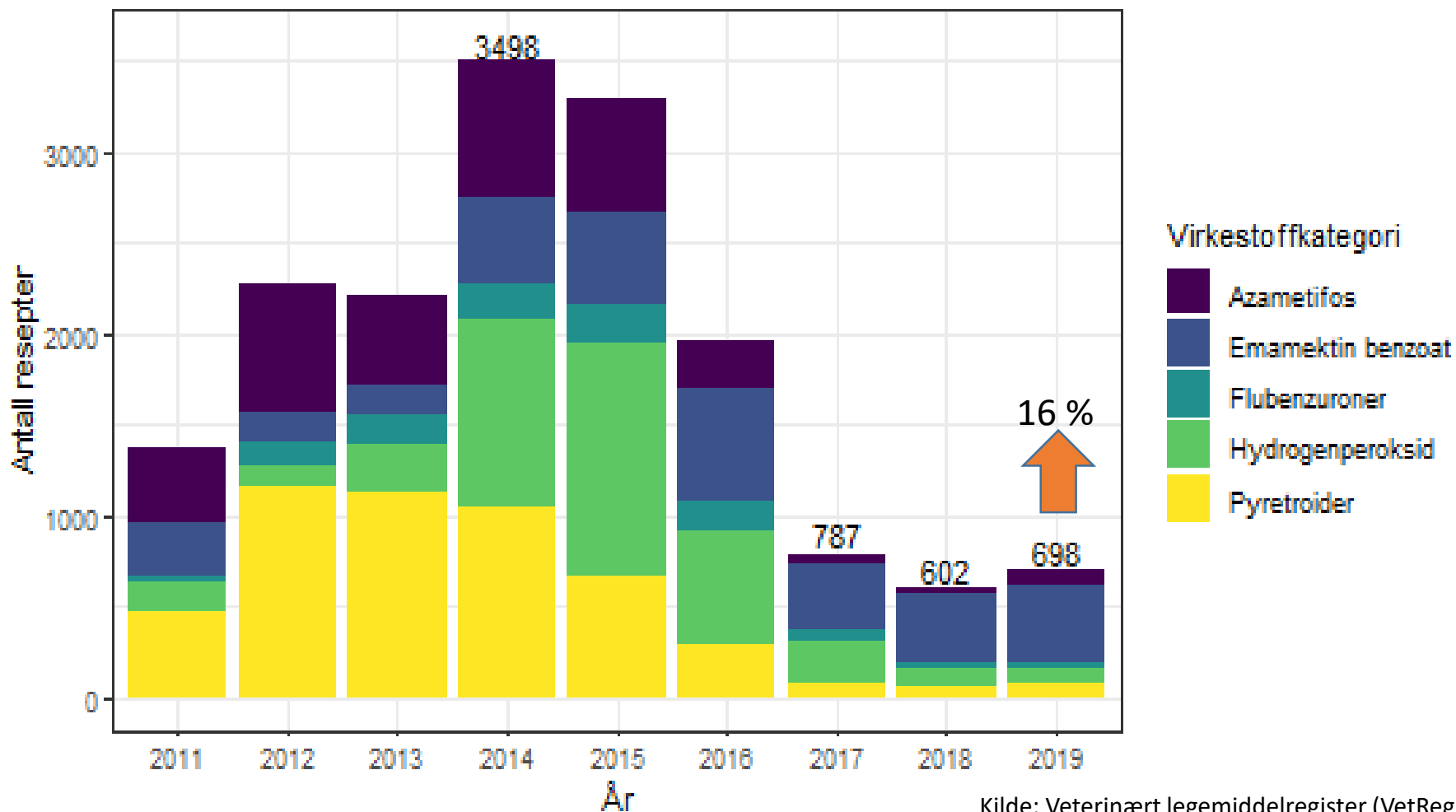
# Oversikt

- Hvilke behandlinger ble utført mot lus i 2019?
  - Resultater fra resistensovervåkninga i 2019
  - Resistensutvikling over tid
  - Konklusjon
- 
- NB! Foreløpige resultater



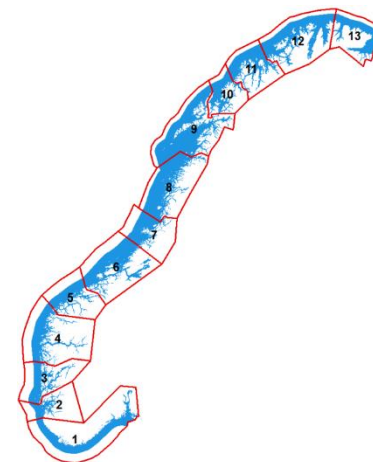
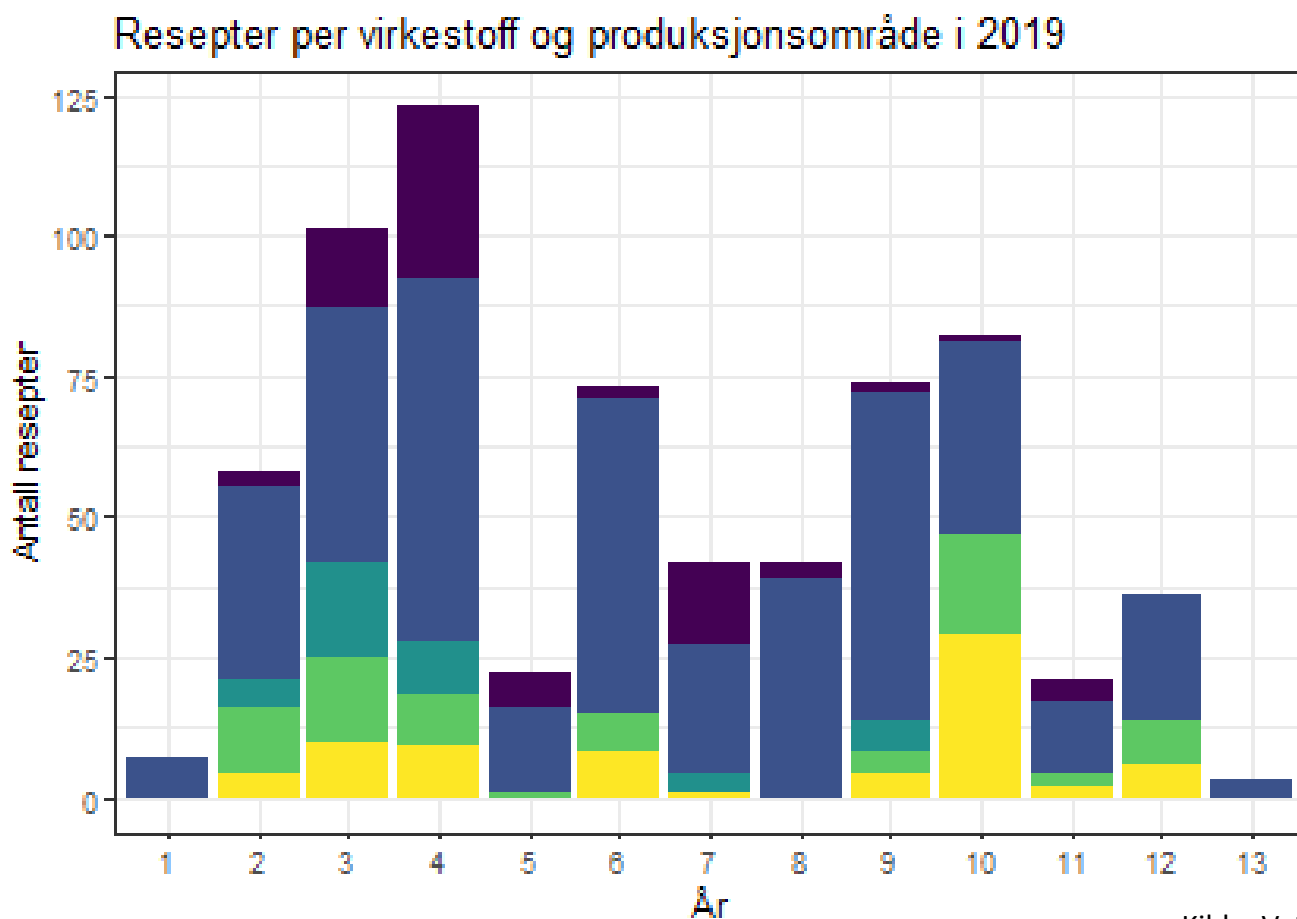
# Medikamentelle behandlinger

Resepter per virkestoff per år



Kilde: Veterinært legemiddelregister (VetReg)

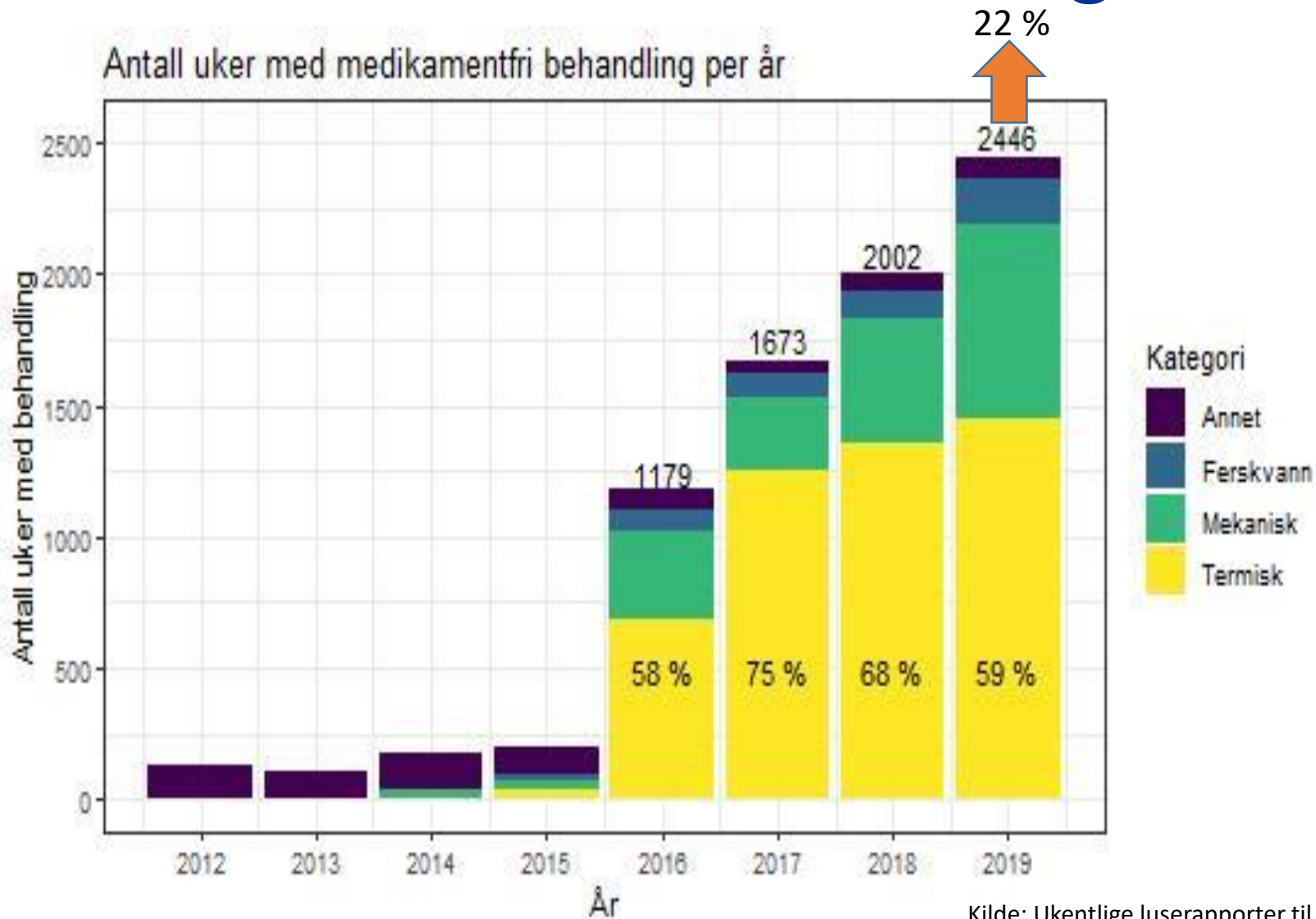
# Hvor ble behandlingene utført i 2019?



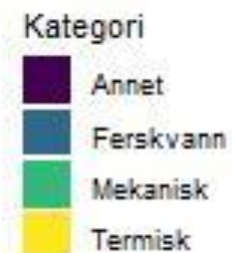
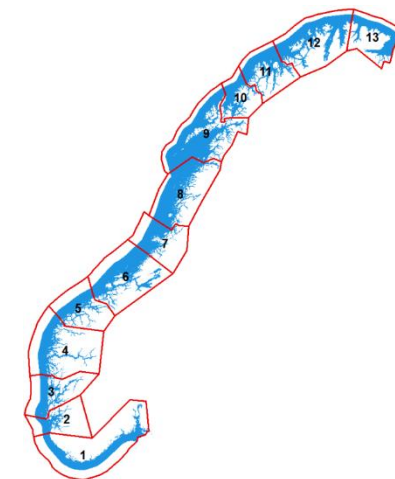
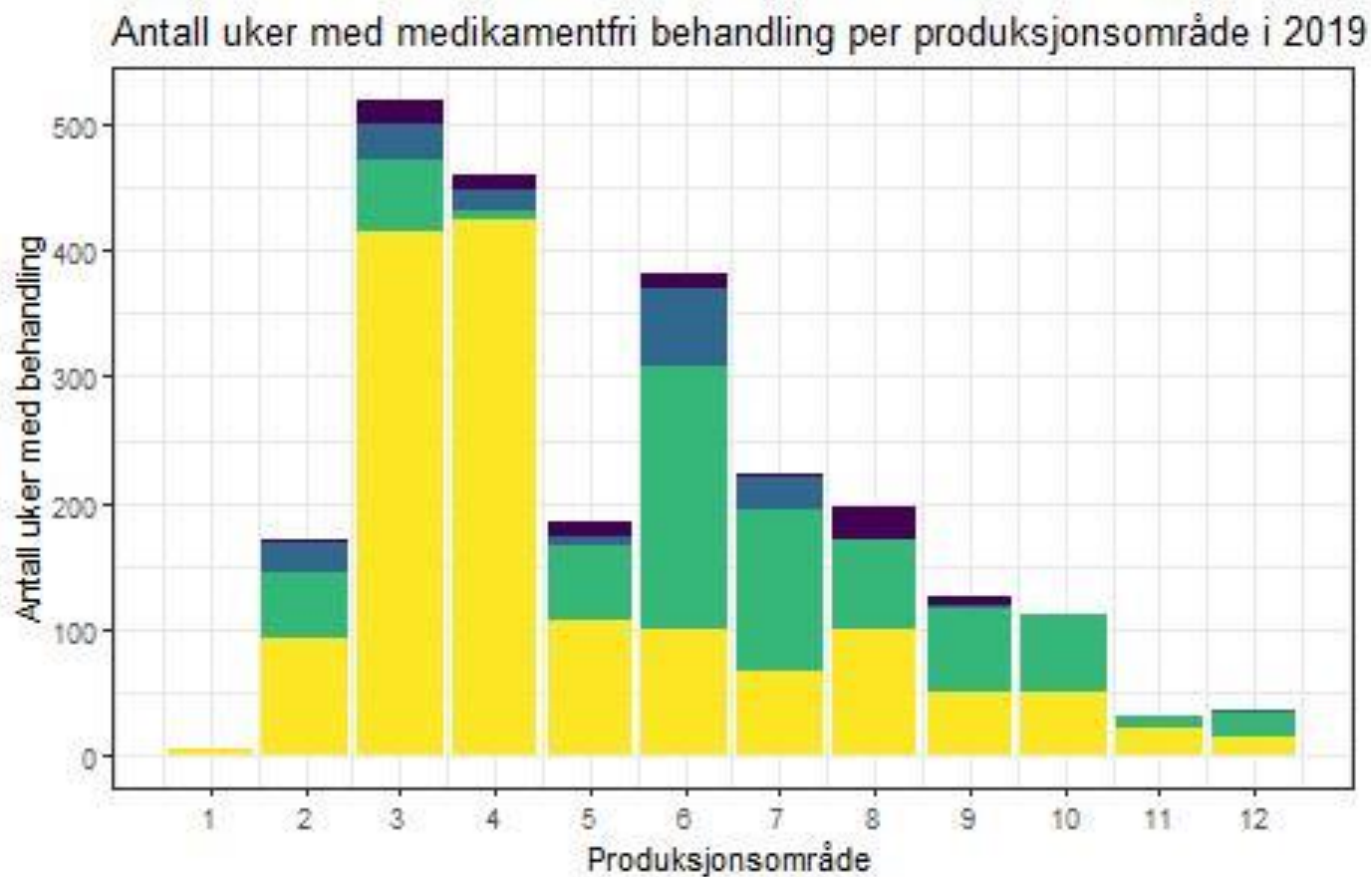
## Virkestoffkategori

- Azametifos
- Emamektin benzoat
- Flubenzuroner
- Hydrogenperoksid
- Pyretroider

# Medikamentfrie behandlinger



# Hvor ble behandlingene utført i 2019?



# Biologiske assays for resistensovervåkning

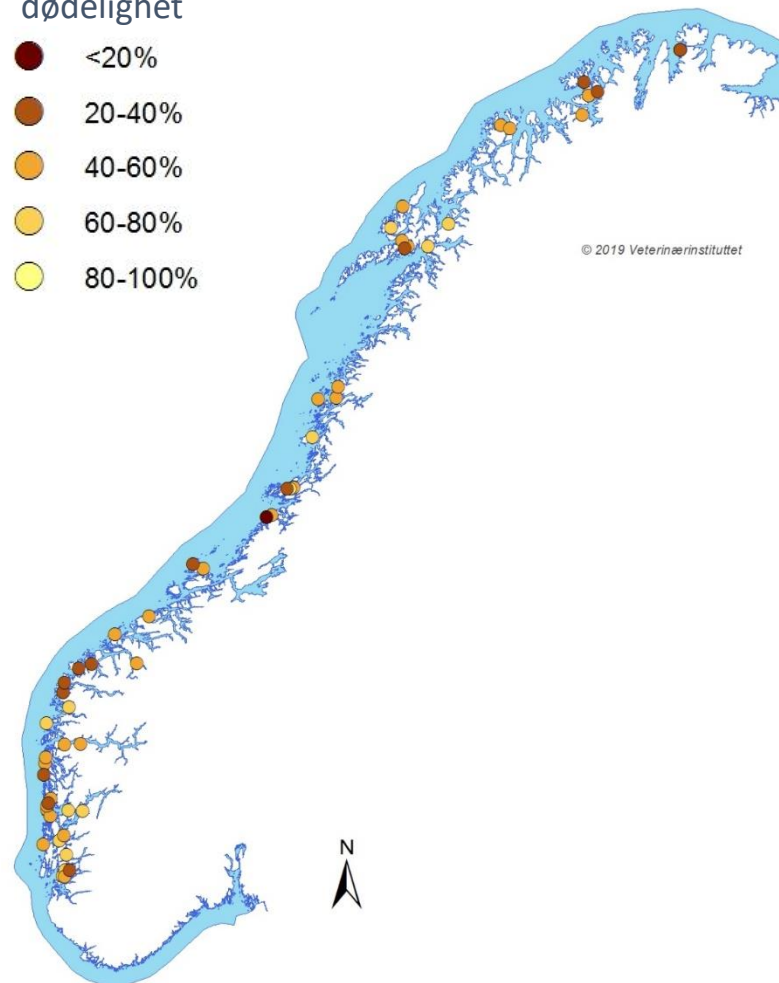
- Overvåkningsprogrammet for resistens hos lakselus utføres av Veterinærinstituttet på vegne av Mattilsynet (siden 2013)
- Aktiv overvåkning
  - Ca. 65-75 bioassays, 4 stoffer, 2 konsentrasjoner
  - Azametifos (organofosfat), deltametrin (pyretroid), hydrogenperoksid og emamektin benzoat
  - 7 fiskehelsetjenester over hele landet



# Utbredte resistens mot organofosfater i 2019

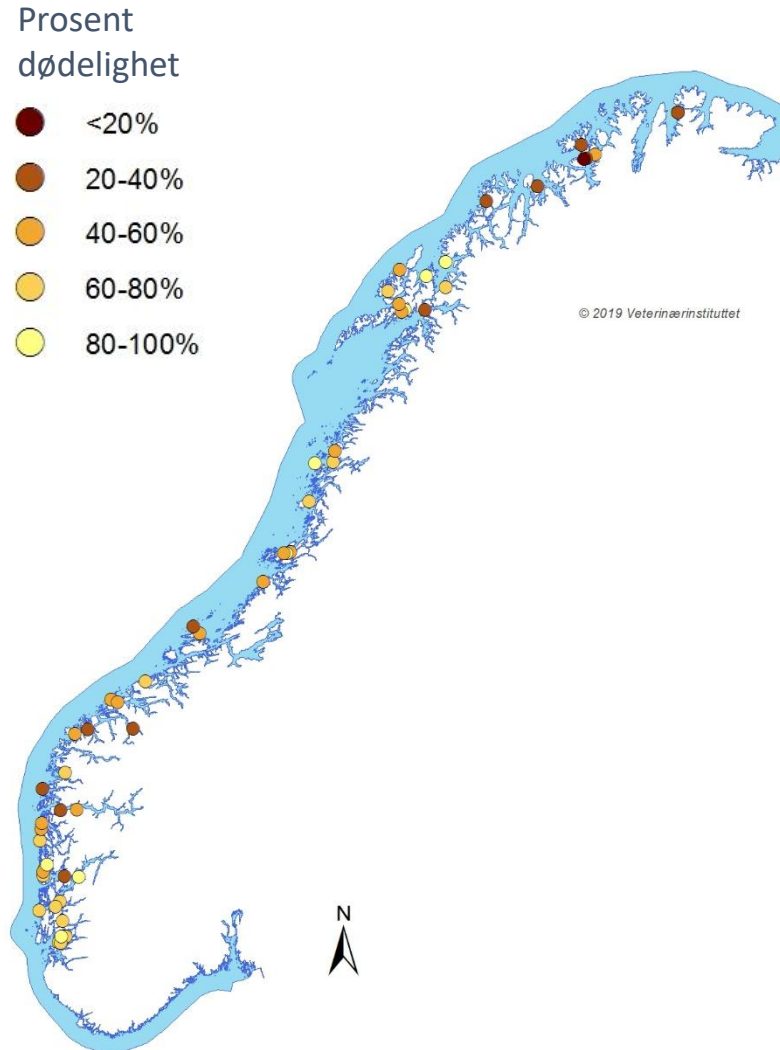
Prosent  
dødelighet

- <20%
- 20-40%
- 40-60%
- 60-80%
- 80-100%





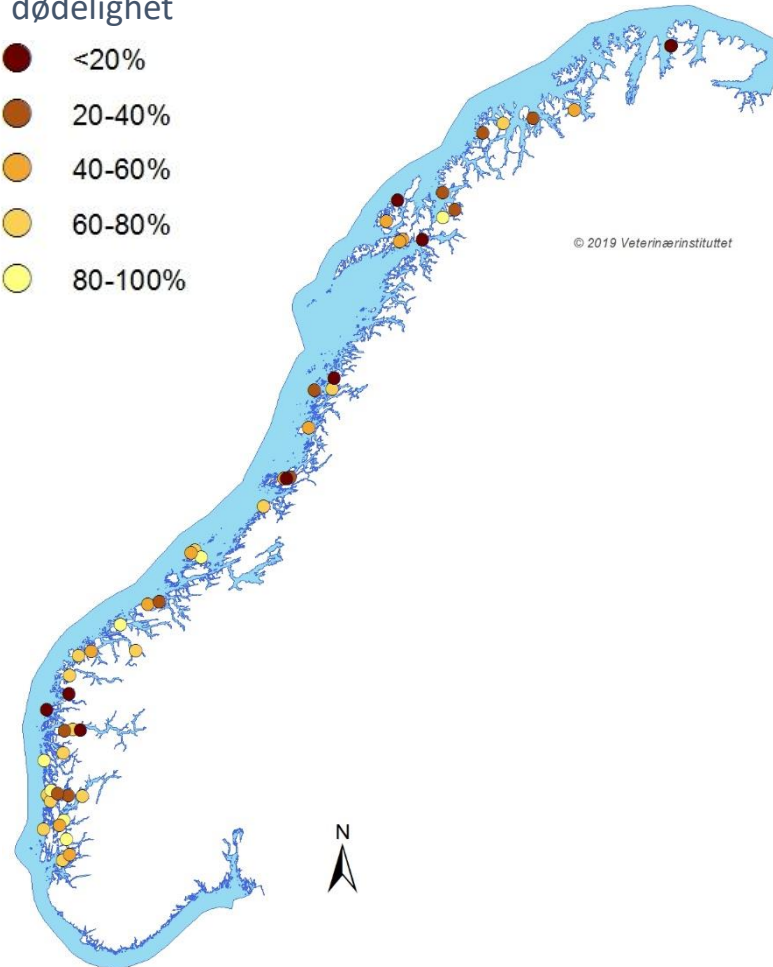
# Utbredte resistens mot pyretroider i 2019



# Utbredte resistens mot emamektin benzoat i 2019

Prosent  
dødelighet

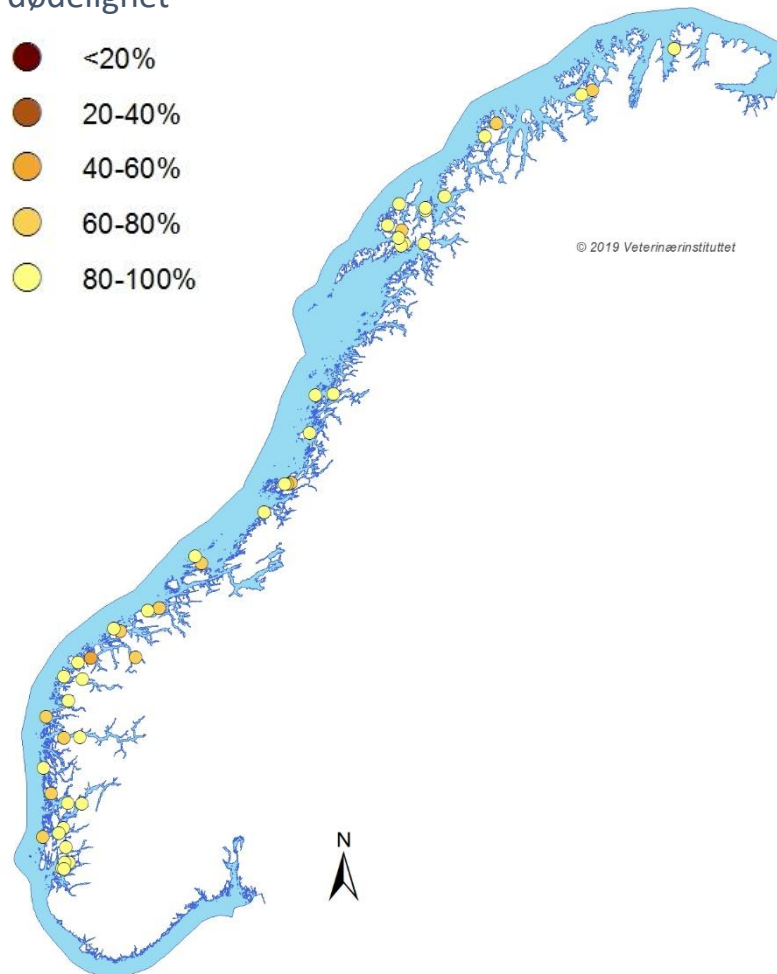
- <20%
- 20-40%
- 40-60%
- 60-80%
- 80-100%



# Fortsatt minst resistens mot hydrogenperoksid i 2019

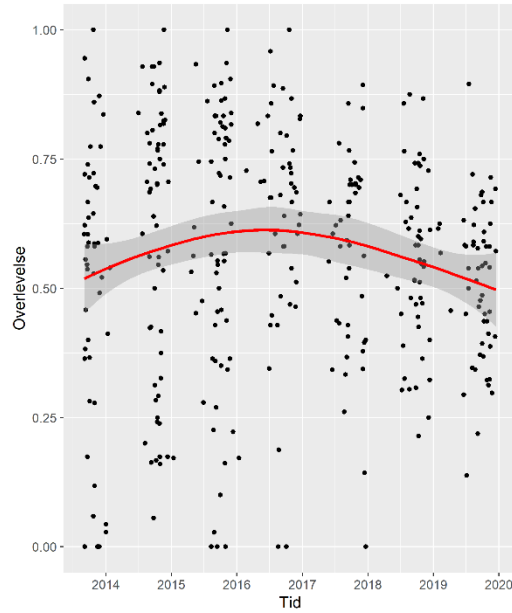
Prosent  
dødelighet

- <20%
- 20-40%
- 40-60%
- 60-80%
- 80-100%

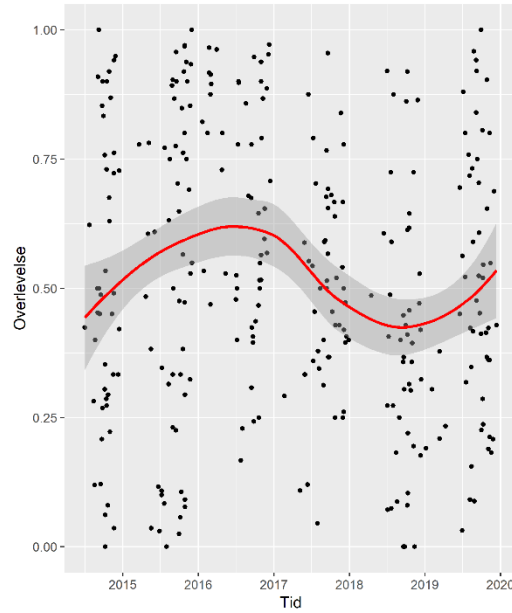


# Utvikling av resistens over tid

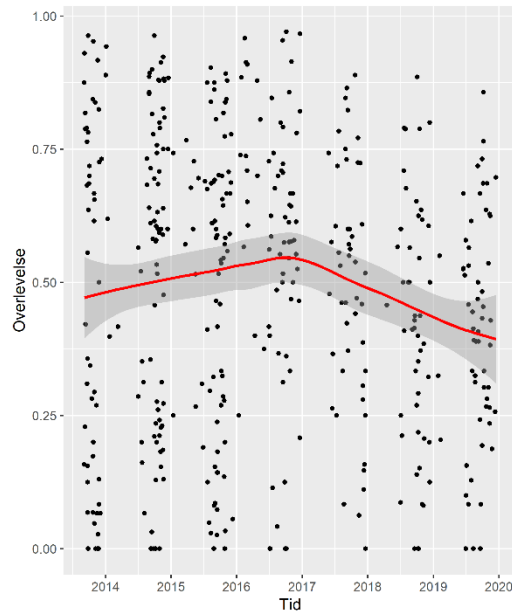
**A** Overlevelse i azametifos bioassay



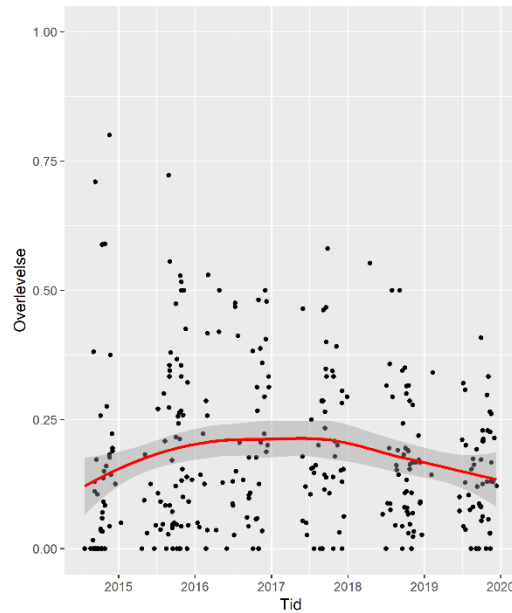
**B** Overlevelse i emamektinbenzoate bioassay



**C** Overlevelse i deltametrin bioassay

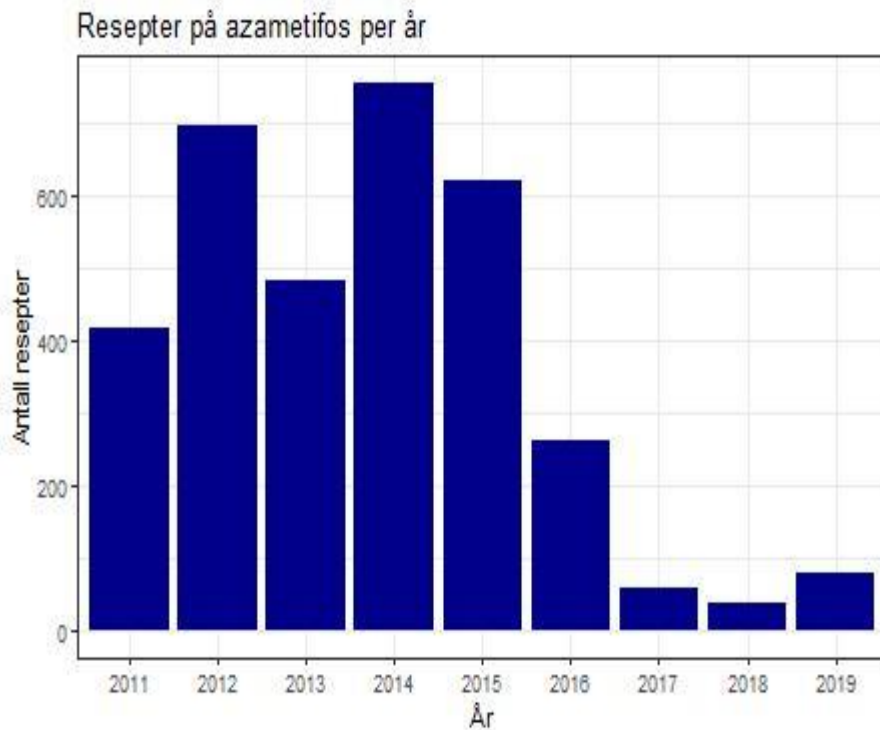


**D** Overlevelse i hydrogenperoksid bioassay

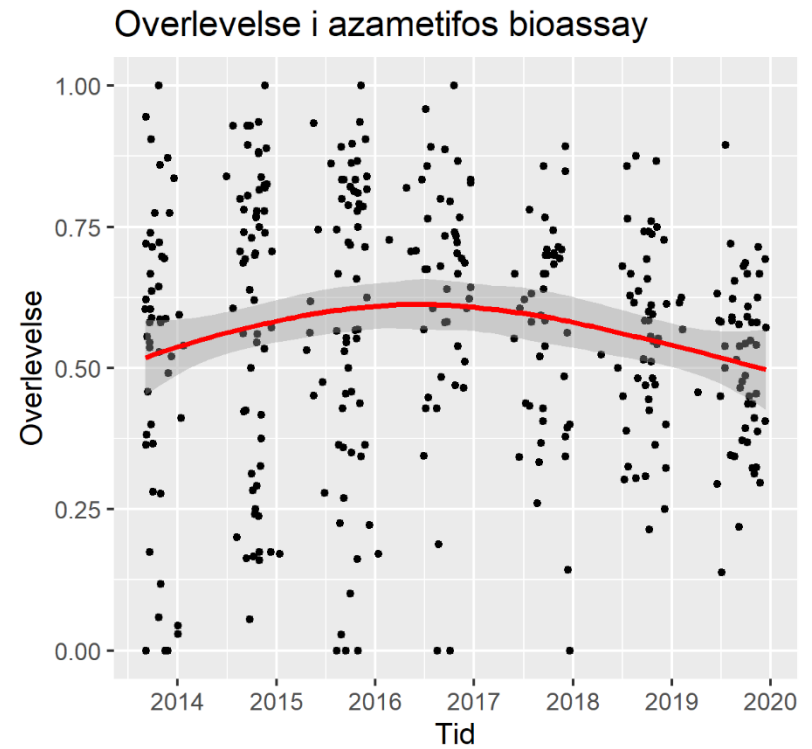


# Organofosfater

## Forbruk

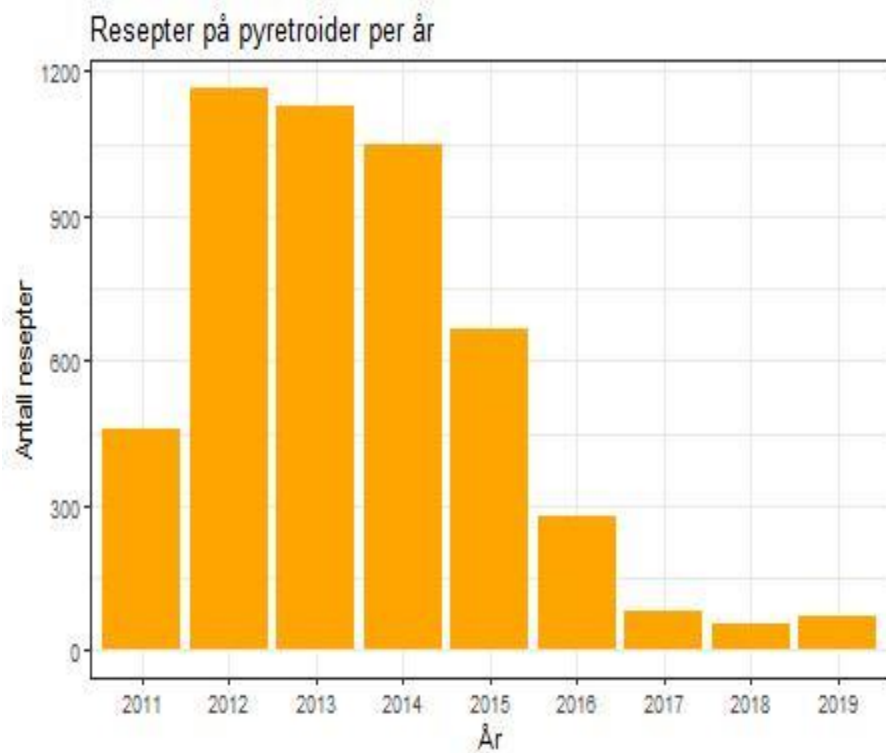


## Resistens

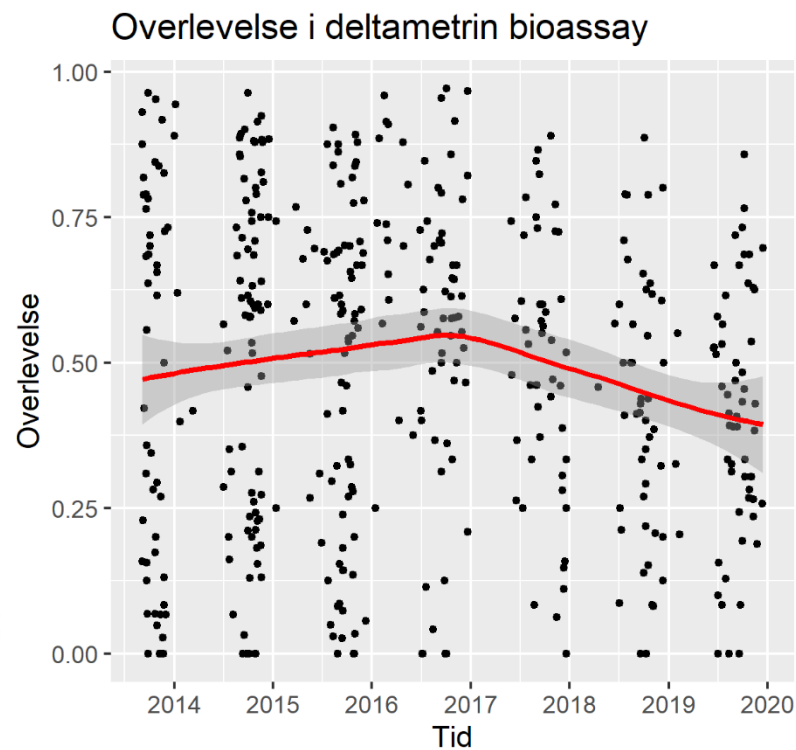


# Pyretroider

## Forbruk

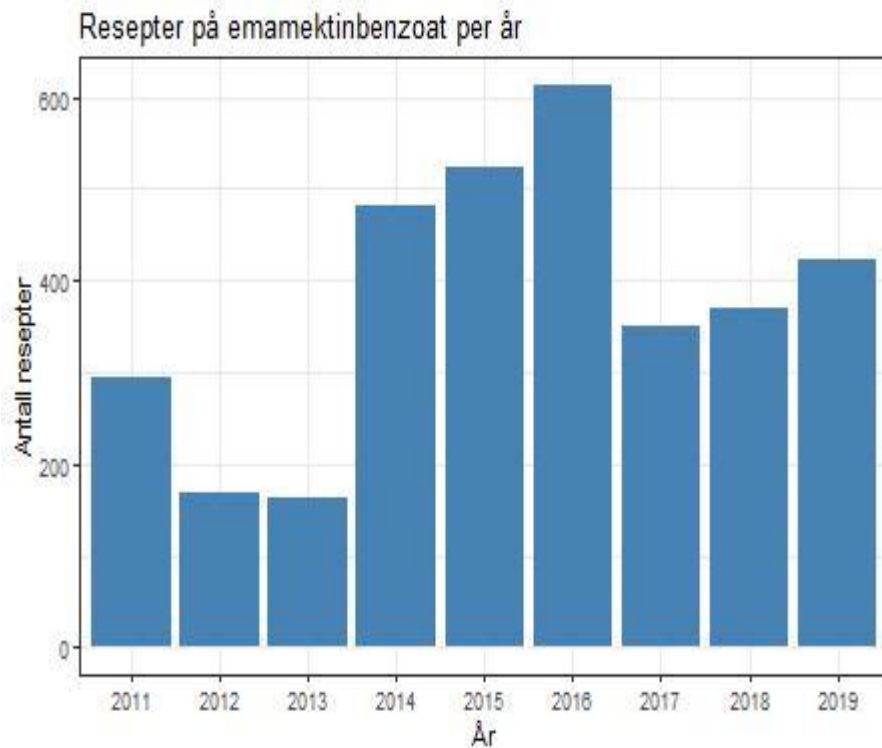


## Resistens

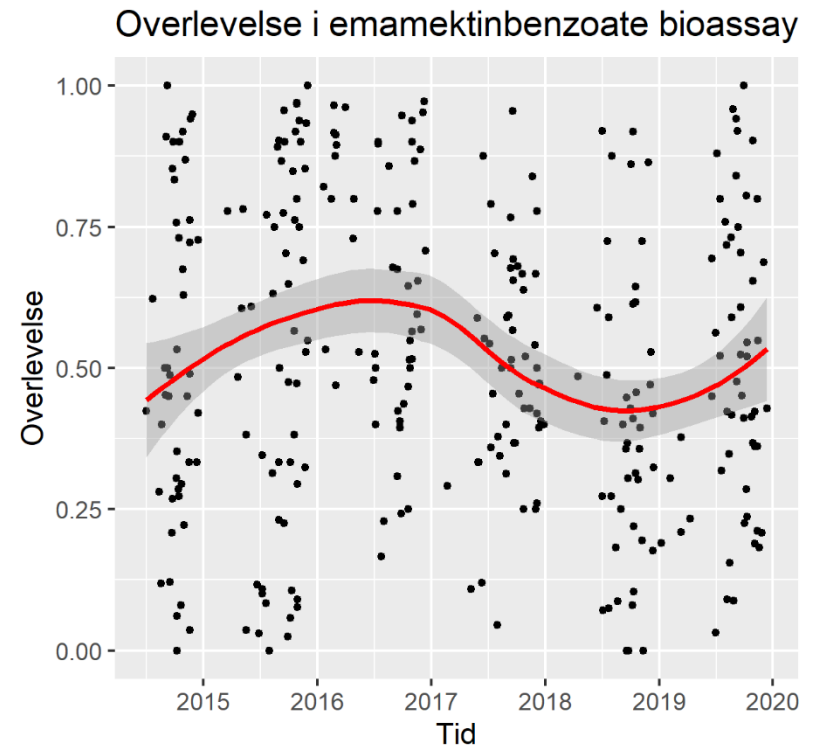


# Emamektinbenzoat

## Forbruk

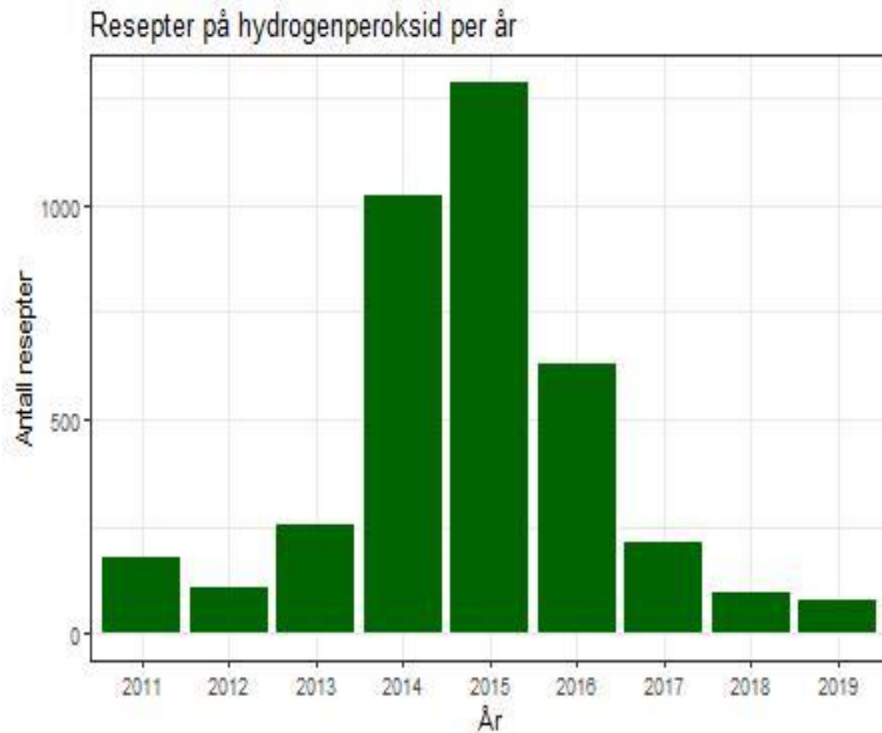


## Resistens

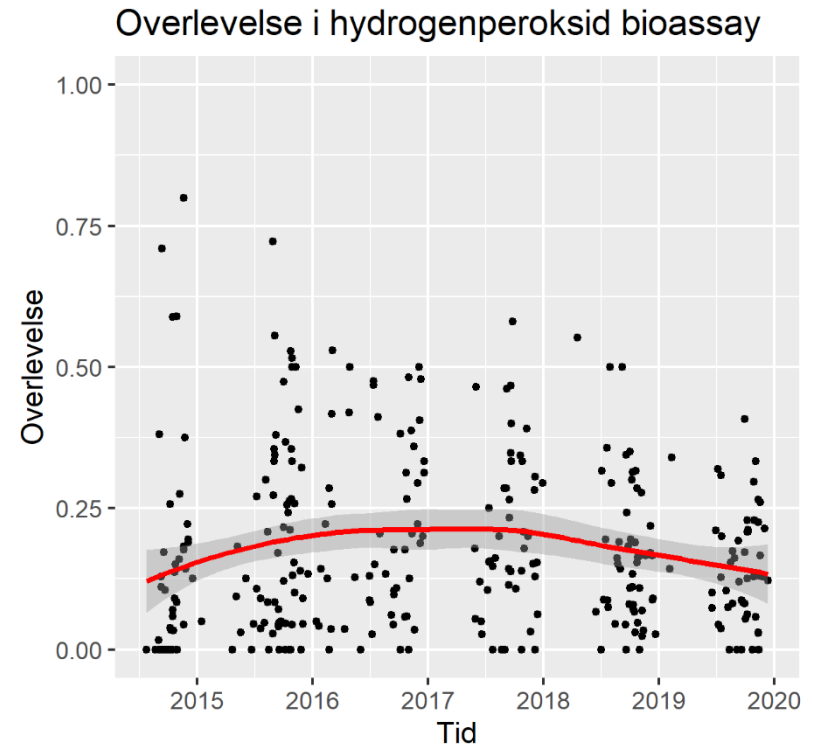


# Hydrogen peroksid

## Forbruk



## Resistens





# Konklusjon

- Antall medikamentelle behandlinger gikk noe opp i fjor
- Antall medikamentfrie behandlinger økte
- Fortsatt resistent lakselus langs hele kysten
- Lusa er minst resistent mot hydrogenperoksid
- Etter år med økning i resistens, ser det ut til å være en reduksjon fra og med 2017
  - Men ny økning i resistens mot emamektinbenzoat i 2019



# Takk til fiskehelsetjenestene for godt samarbeid i 2019:

- AkvaVet Gulen
- Aquakompetanse
- STIM Bergen, Måløy og Harstad
- FoMAS
- HaVet
- Marin Helse
- Åkerblå

