

# Controlling tiger mosquito in Switzerland: Does integrated management work?

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# Problem

- Tiger mosquito
  - ▶ nuisance (picking)
  - ▶ can carry dangerous viruses



- integrated management:
  - ▶ chemical and biological treatments
  - ▶ informing citizens



# Effectiveness?

- integrated management costs money and energy
- does it really work?
- how to test?

# Design observational study

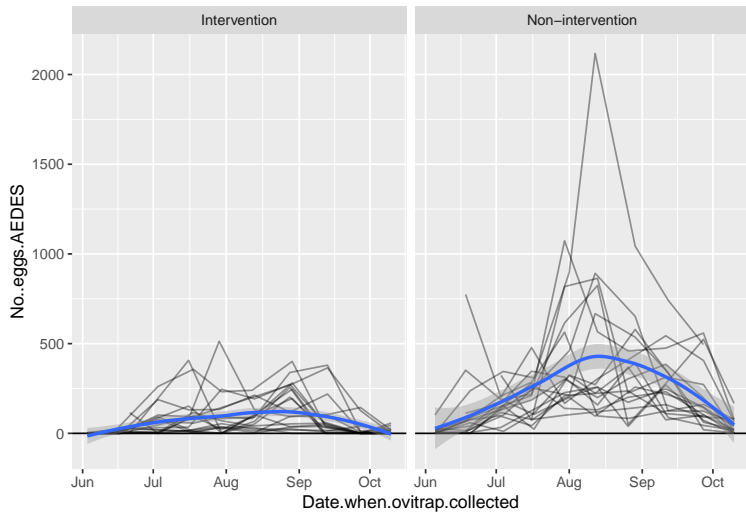
- Ticino == "Intervention area" (integrated management)
- Italy == "Non-intervention area" (no control measures)



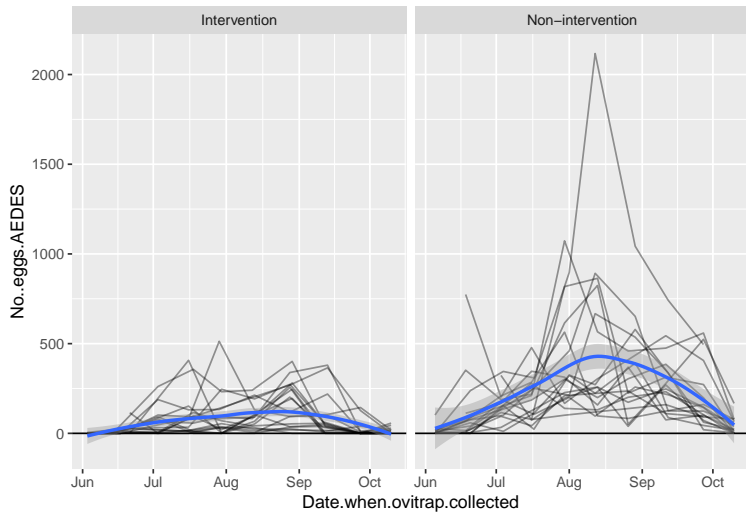
## Design observational study

- $y$ : tiger mosquito abundance (nr. eggs) measured via ovitraps
  - all 36 ovitraps repeatedly measured every 14 days
- about 10 observations per ovitrap

# Data (1)



# Data (2)





# Predictors

- date: quadratic polynomial
- Area: "Intervention", "Non-intervention"
- date & Area: their interaction
- Ovitrap & Municipality: as random effects

- {glmmTMB}
- Mixed models + counts + overdispersion + zero-inflation

## Results (1)

- zero-inflation not needed
- overdispersion present
- no date-Area interaction

## Results (2)

- date nice and quadratic
  - estimated "Non-Intervention" effect is 3.8 {2.7; 5.4}
- almost **four times more eggs** in uncontrolled regions

# Model diagnostics

- classical ones
- time and space correlation

# Conclusions

- large and clear "Intervention" effect
- it is extremely likely that "Intervention" does help

## Next steps

- further observational studies
- lab experiments

Publication at: <https://bit.ly/3sFYZjI>