Farrington and Noufaily

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Section for Dynamical Systems
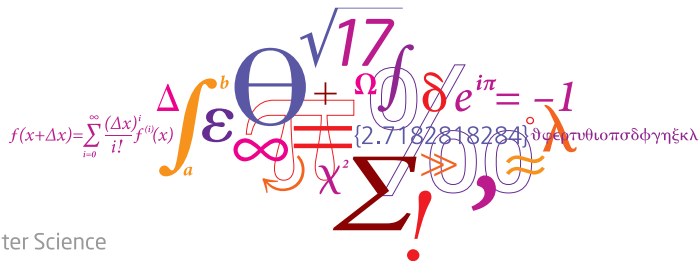
Outline

- Data exploration
  - VTEC / STEC
  - Prepare the data for modelling with `surveillance`

- Farrington
  - Implementation
  - Results

- Noufaily
  - Implementation
  - Results

Date	ageGroup	y	n
2008-01-01	<1 year	2	64137
2008-01-01	1-4 years	2	259910
2008-01-01	5-14 years	2	680529
2008-01-01	15-24 years	1	631724
...	...	...	...
2022-12-01	55-64 years	2	773073
2022-12-01	65-74 years	5	621965
2022-12-01	75-84 years	4	449423
2022-12-01	85+ years	3	132181

VTEC / STEC

Shiga- og veratoxin producerende E. coli.
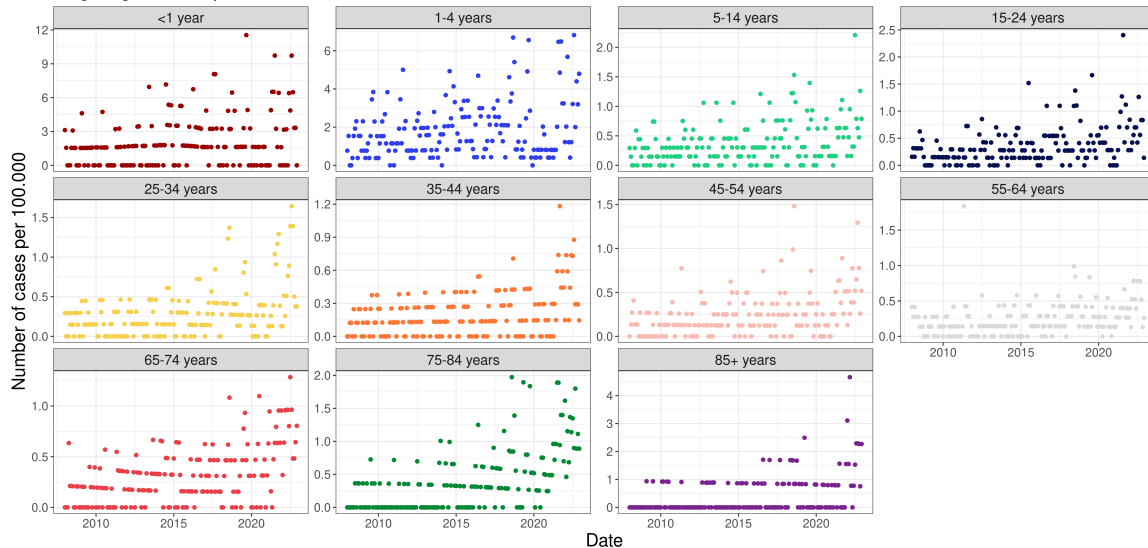
Prepare the data for modelling with `surveillance`

```r
# Import libraries
library(readr)
library(dplyr)
library(tidyr)
library(surveillance)

# Import the data
dat <- read_rds(file = "../../data/processed/dat.rds")

# Only consider some of the data
y <- dat %>%
  filter(caseDef == "Shiga- og veratoxin producerende E. coli.") %>%
  group_by(Date, ageGroup) %>%
  reframe(y = sum(cases), n = sum(n))

# Widen observations into a matrix format
observed <- y %>%
  select(-n) %>%
  pivot_wider(
    names_from = c(ageGroup),
    names_sep = ".",
    values_from = y) %>%
  arrange(Date)

# Widen population sizes into a matrix format
population <- y %>%
  select(-y) %>%
  pivot_wider(
    names_from = c(ageGroup),
    names_sep = ".",
    values_from = n) %>%
  arrange(Date)
```

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```
# Specify the controls for the Farrington method
con.farrington <- list(
  range = NULL, b = 5, w = 3,
  reweight = TRUE, weightsThreshold = 1,
  verbose = TRUE, glmWarnings = TRUE,
  alpha = 0.05, trend = TRUE, pThresholdTrend = 0.05,
  limit54 = c(5,4), powertrans = "2/3",
  fitFun = "algo.farrington.fitGLM.flexible",
  populationOffset = TRUE,
  noPeriods = 1, pastWooksNotIncluded = NULL,
  thersholdMethod = "delta"
)

# Execute the Farrington method
STEC_farrington <- farringtonFlexible(sts = STEC, con.farrington)
```

Results

Shiga- og veratoxin producerende E. coli.

Farrington method
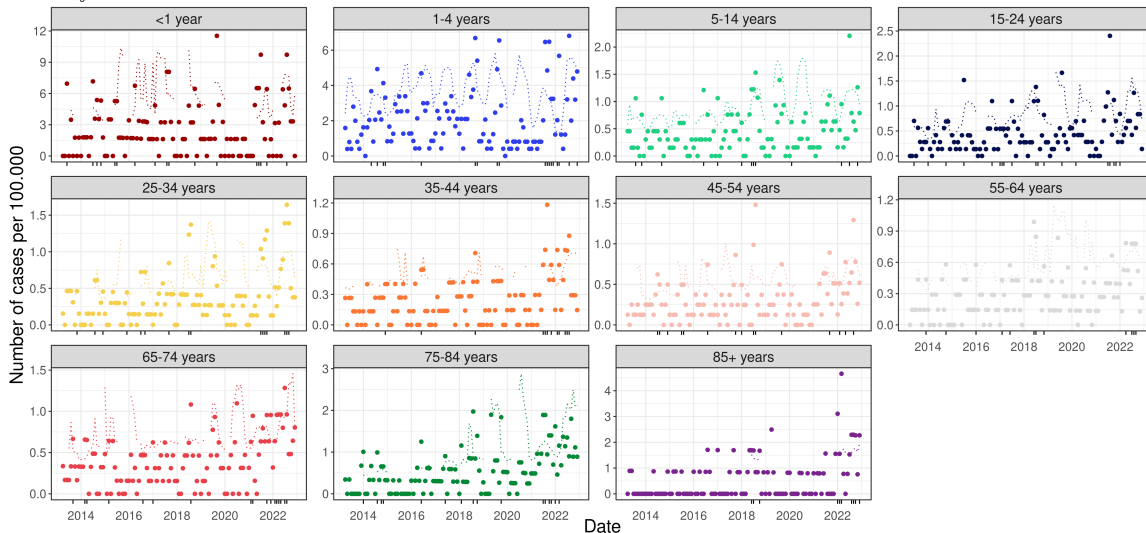
```
# Specify the controls for the Noufaily method
con.noufaily <- list(
  range = NULL, b = 5, w = 3,
  reweight = TRUE, weightsThreshold = 2.58,
  verbose = TRUE, glmWarnings = TRUE,
  alpha = 0.05, trend = TRUE, pThresholdTrend = 0.05,
  limit54 = c(5,4), powertrans = "2/3",
  fitFun = "algo.farrington.fitGLM.flexible",
  populationOffset = TRUE,
  noPeriods = 1, pastWeeksNotIncluded = NULL,
  thersholdMethod = "delta"
)

# Execute the Noufaily method
STEC_noufaily <- farringtonFlexible(sts = STEC, con.noufaily)
```

Results

Shiga- og veratoxin producerende E. coli.

Noufaily method