**Force of-Infection model**

We used catalytic model to test weather or not the incidence per -susceptible population has remained constant over time or has recently been introduced.

For a constant FOI (, we can express the seroprevalence as for age in the year of the serosurveys (τ) as:

For a stepwise non-constant FOI, we can express the seroprevalence for age in the year of the serosurveys (τ) as:

Where, is the FOI experienced from the year of the serosurveys (until the year of introduction of the virus ( and represents the FOI experienced from that point until the year of birth .

Models were fitted to sero-prevalence data for the three viruses (UNA, MAAV and VEEE) using MCMC and metropolis hasting algorithm, with 50,000 iterations. Best model was chosen according to lowest Deviance Criterion (DIC).

**Results**

***Mogue dataset (sero-survey 2017)***

|  |  |  |  |
| --- | --- | --- | --- |
| model | MADV | VEEN | UNA |
| 1. Constant |  |  | 276.17 |
| 1. Introduction |  |  |  |
| 1. Epidemic1 |  |  | 261.40 |
| 1. Epidemic2 |  |  |  |
| 1. Epidemic3 |  |  | 198.78 |
| 1. Inter-endemic1 |  |  | 271.02 |

***HH dataset (sero-survey 2012)***

|  |  |  |
| --- | --- | --- |
| model | MADV | VEEN |
| 1. Constant |  |  |
| 1. Introduction |  |  |
| 1. Epidemic1 |  |  |
| 1. Epidemic2 |  |  |
| 1. Epidemic3 |  |  |
| 1. Inter-endemic1 |  |  |

**Conclusions**

For all three virus the predicted exposure period goes back decades, suggesting some degree of endemicity. For both MADV, VEEN the non-constant FOI model predicts an increase in the FOI in the last decade, probably corresponding to an outbreak.