Seroprevalence and risk factors associated with West Nile Virus infection in wild birds in 4 regions of Madagascar

- **West Nile virus :** zoonotic arbovirus of birds which can affect Humans and horses, endemic in Madagascar but never studied in wild bird populations
- Statistical model : What is the seroprevalence and the risk factors associated with the infection of WVN in bird on Madagascar?
- Mechanistical model: How can be maintain endemic transmission without new reintroduction in passerine bird population from Alaotra-Mangoro

Aknowlegment: Thanks to Anthonio,Angelo and Santino for reading my slide

- Serological survey of 354 birds from 4 regions of Madagascar in 2016-7
- **Seroprevalence: 12.5%** (44/352) of birds [95%CI: 11.0-14.0] (belonging to 19/41 species)

- Response variable: serological status
- Family: Binomial
- Link: Logit
- Potential predictors:

Order, Region, wetland proximity, area distribution

R code:

<- glm(Res~PZH+Ordre2+SERR+Regionr, data=WN, family="binomial")

summary (mod7rrr)

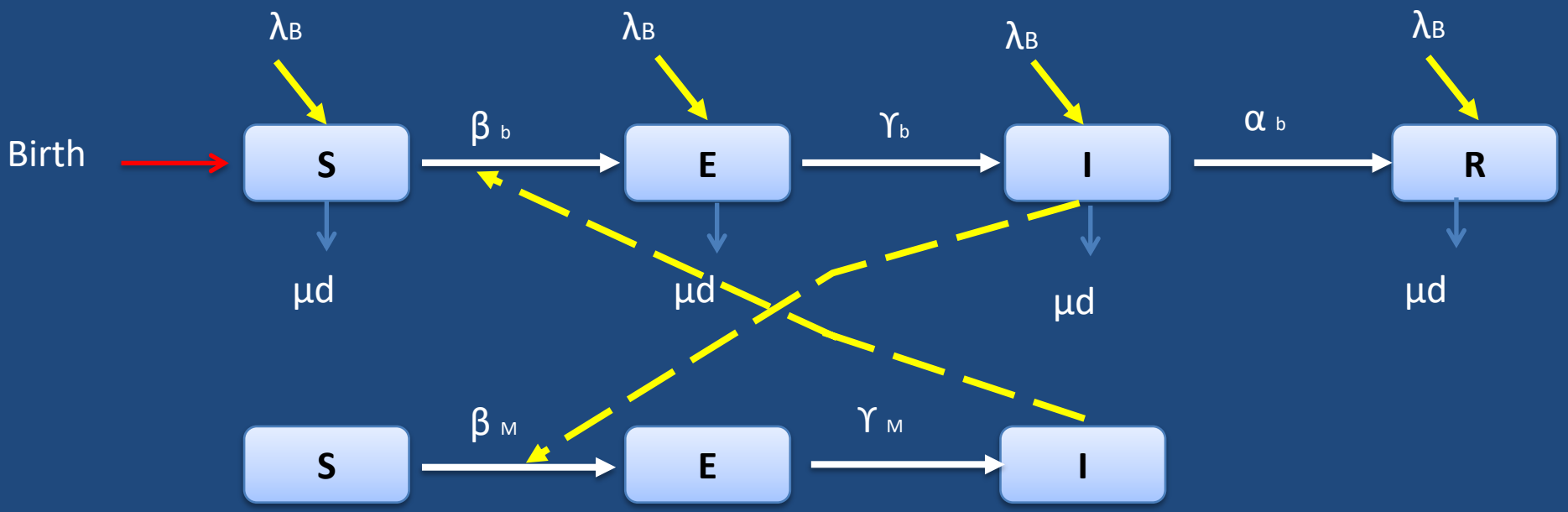
drop1(mod7rrr,.~.,test="Chisq")

Hypothesis: high seroprevalence in bird is associated with order, region, proximity of wetland and bird its Africa's distribution

Logistic regression model: risk factors

Variables		OR	95% CI OR	p
Constant		0,002	9.10^{-05}-0,02	
Proximity to wetlands	Yes	1		0,021
	No	**8,19**	1,2-165,1	
Order	Others order	1		0,023
	Ciconiiformes	2,5	0,3-29,5	
	Passeriformes	**4,99**	1,6-16,2	
Region	Analamanga	1		$5,01.10^{-06}$
	Itasy	9,2	1,2-115,3	
	Vakinankaratra	1,6	0,03-41,6	
	Alaotra-Mangoro	**41,4**	6,2-610,7	
Distribution area	Widespread	1		0,0002
	Endemic to Indian Ocean	2,6	0,5-14,3	
	Endemic to Madagascar	1,1	0,28-4,8	
	Africa	**31,9**	5,46-313,1	

AUC ROC: 0,856



S:Susceptible bird
E:Exposed bird
I: Infected bird
R:recovery bird
S: susceptible mosquito
E:exposed mosquito
I:infectious mosquito

λB: bird migration rate(0 when there is no migration)
βb: transmisssion rate in bird
γb:incubation rate in bird
α b:recovery rate in bird
μd:death rate in bird
β M:transmission rate in mosquito
γ M:incubation rate on mosquito

Next Steps

- Do my mechanistical model framework and fit in it on my data
- Begin to write my article