Asthma exacerbation module

- Input: sex, age, time since asthma diagnosis (Dx), asthma control, and previous asthma exacerbations
- We used a Poisson model for the number of asthma exacerbations using the Economic Burden of Asthma study and the Gaining Asthma controL (GOAL) study.
- For V1, we only incorporated the effect of asthma control.
- From the EBA study, we obtained the annnnnnnnnual exacerbation rate, which was 0.347/year. Next, from the GOAL study, we obtained the probability of exacerbation given the control levels. Combining both, we obtained the unique rate of exacerbation given the control level. For details, see here.
- For agent i, let $Y_{i,t}$ be the number of exacerbations in year t:

  $$Y_{i,t} = Poisson(\lambda_{i,t}),$$

  where

  $$\lambda_{i,t} = \lambda(X_{i,t}) = \exp(\beta_{0,i} + \beta_{sex} \times sex + \beta_{age} \times age + \beta_{Dx} \times Dx + \beta_{prev\_exac} \times prev\_exac + \beta_{control} \times control)$$

  with $\beta_{0,i} \sim Normal(\mu_0, \sigma_0^2)$.