* 1. Log[E(ceb|xi­) = β0 + β1res2 + β2res3 + log(n)
  2. Yes, it does include an offset. This is because the event (giving birth) can happen multiple times for each subject.
  3. 

The IRR for this is e.2280596 = **1.256**.

The incidence rate of giving birth for those who live in rural areas is 25.6% higher than those who live in Suva.

* 1. To get the CI for the IRR in part c, we use the β2 and the Seβ2 which are .2280596 and 0.0278321 respectively. The lower bound would be e^(.2280596 - 1.96\*0.0278321) and the upper bound would be e^(.2280596 + 1.96\*0.0278321), resulting in **(1.189,1.327).** Based on this result, seeing how the CI doesn’t include 1, the incidence rate of giving birth is significantly different between rural and Suva. We are 95% confident that our incidence rate of birth for those who live in rural areas is 18.9%-32.7% higher than those who live in Suva.
  2. Log[E(ceb|xi­) = β0 + β1res2 + β2res3 + β3edu + β4mar + β5edu\_mar + log(n)
  3. 

The IRR is eβ3+β5= e^-.2601035 = 0.771. Women with upper primary education or above have an incidence rate of birth 0.771 times that of those without primary education or above, among those who have been married for 15 years or more, adjusting for residence place type.



LR test produces a p-=value of 0.0000. Reject null hypothesis.

Duration since first marriage significantly modifies the effect of education level on giving birth, adjusting for residential type.

* 1. The average number of children ever born to a group of 50 women who live in Suva, married less than 15 years, without upper primary or higher education level is just β0 + ln(50) = **4.781**.

1. 

Using STATA, the CI for IRR comparing women living in rural residences to women living in Suva is (0.5286972,2.984579).

We are 95% confident that incidence rate of birth for women living in rural residences is 48% lower to 198% higher than those living in Suva. However, since the CI contains 1, there is not enough evidence to suggest that the number of children expected for women in rural residences and Suva are different.

* 1. The CI in 3a is larger than the once in 1d (.53, 2.98 and 1.19, 1.33 respectively). This did in fact change my results. A possible cause of this change is that of Over-Dispersion.

 LRtest

G = 2\*(-83.985578) – 2\*(-1315.2616) = 2462.55 > 3.84.

There is evidence of Over-Dispersion.

* + 1. Negative Binomial Regression is most appropriate. With the LR test proving over-dispersion being present, the NBR would model best.
    2. Poisson with RVE is between Poisson and NBR. The RVE helps the model become more robust against model specification. However, this model is not as appropriate as NBR.
    3. Poisson is the least appropriate. There is no accommodation for Over-Dispersion.