The objectives of this thesis was to model seasonal variations in claim intensities and to evaluate the dependency of covariates on claim rates. The data for this thesis were obtained from claimants registered during September 2009 to August 2011, both inclusive at the Ethiopian Insurance Corporation in Hawassa. We present a procedure for consistent estimation of the claim frequency for motor vehicles in the Ethiopian Insurance Corporation, Hawassa District. The seasonal variation is modeled with a non-homogeneous Poisson process with a time varying intensity function. Covariates of the policy holders, like gender and age, is corrected for in the average claim rate by Poisson regression in a GLM setting. An approximate maximum likelihood criterion is used when estimating the model parameters. The seasonal parameters are found to be ±25% and to be statistically significant. February has highest while August has lowest claim rate. Only age group 36-45 has significantly lower claim rate than age group 20-25. The rate is about one third. Lastly female is not found to have significantly lower claim rates than males, however, there are indications that might be slightly so.