Introduction to Dynamic Spatio-Temporal Models

Erick A. Chacon-Montalvan[1], Erick A. Chacon-Montalvan[2], Erick A. Chacon-Montalvan[3], Erick A. Chacon-Montalvan[3]

[1] *CHICAS, Medical School, Lancaster University, Lancaster, United Kingdom*
[2] *CHICAS, Medical School, Lancaster University, Lancaster, United Kingdom*

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Abstract

In the geometric distribution, θ represents the probability of succes in each trial. Furthermore, it should follow that y is countable and greater than one. In general, in the negative binomial distribution, y is the number of trials until get the k first success. For this reason, the negative binomial distribution has certain assumptions considering that each event come from a Bernoulli distribution.(i) Each x_i is independent of any.In the geometric distribution, θ represents the probability of succes in each trial. Furthermore, it should follow that y is countable and greater than one. In general, in the negative binomial distribution, y is the number of trials until get the k first success. For this reason, the negative binomial distribution has certain assumptions considering that each event come from a Bernoulli distribution.(i) Each x_i is independent of any.

Keywords: Spatio-temporal, Climate variability, Malaria prevalence, geostatistics, Matern.

1. Introduction

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Statement:

$$p(y > r|\theta) = (1-\theta)^r, \tag{1}$$

where $r = 1, 2, ...$

Proof:

$$p(y > r|\theta) = 1 - p(y \leq r|\theta)$$

$$p(y > r|\theta) = 1 - \sum_{k=1}^{r}(1-\theta)^{k-1}\theta$$

$$p(y > r|\theta) = 1 - \theta\sum_{k=1}^{r}(1-\theta)^{k-1}$$

$$p(y > r|\theta) = 1 - \theta\left[\frac{1-(1-\theta)^r}{1-(1-\theta)}\right]$$

$$p(y > r|\theta) = 1 - \theta\left[\frac{1-(1-\theta)^r}{\theta}\right]$$

$$p(y > r|\theta) = 1 - [1-(1-\theta)^r] = (1-\theta)^r$$

For this reason, the negative binomial distribution has certain assumptions considering that each event come from a Bernoulli distribution.(i) Each x_i is independent of any other x_j, (ii). They are identically distributed $x_i \sim \theta^{x_i}(1-\theta)^{1-x_i}$, where $i = 1, 2, ...$ (iii) The variance is greater than the mean. For this reason is used in overdispersed countable data. (iv) This distribution is unimodal.

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