NEGATIVE BINOMIAL DISTRIBUTION AS AN ALTERNATIVE TO POISSON DISTRIBUTION FOR CLUSTERED COUNTS

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Abstract

When the observed values are free counts, expected distribution for the data is Poisson distribution. However Poisson distribution often fails to describe the observed counts in actual situations. The reason for this is that the observed counts are not independent and it leads to 'overdispersion'.

In statistical analysis, overdispersion has been explained as variation in response probability on correlation between individual responses. For free counts such variability is referred to as extra-Poisson variation. Standard statistical procedures are not appropriate to analyse incidence when the incidence has a spatial pattern other than random.

The study has clearly been shown that the negative binomial distribution is a good alternative for overdispersed free counts. Compared to Poisson distribution the negative binomial distribution has an extra parameter and this extra parameter can account for the extra variability that cannot be described by the Poisson distribution. Hence, it can be concluded that negative binomial distribution can be thought of when the data exhibits overdispersion.