

An Inflated Probability Model For Adult Out Migration Pattern

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Abstract: The Present paper deals with the development of inflated probability model for adult migrants from the households, with the help of Poisson –Lindley distribution. The parameters of the proposed inflated model have been estimated by moments estimation technique . The suitability of is checked by the real survey migration data .

Keywords:Probability model, Parameters, Estimation technique, Migration process.

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1. Introduction

Adult migration is a function of certain objectives social conditions operating at the rural sources and at the urban destination. Those condition are generally referred to as rural push and urban pull factors of a adult migration. The interplay of those push-pull factors plays an important role in determining the flow of adult migration. Which one is good indicator of the growth of society in respect of social, economic and cultural behavior of the people .In micro level adult migration is a decision that impacts the welfare of the household and the home community. Several attempts have been made to study the pattern of rural out migration through probability model¹⁻⁴. Some mixture of Poisson Lindley distribution were studied by Borah and Deka⁵.

This paper is an attempt to proposed an inflated Probability model to describe the pattern of adult migrants and applied to the survey data.

2. Construction of Model

Under the situation same household have varying number of adult migrants and same households have no adult migrants becomes in form of inflated nature. Keeping this fact into consideration and under the following assumptions

- (1) Due to establishment by migrants in the village at the origin. Let α be the probability that a households in exposed to risk of migration at the time of survey and $(1 - \alpha)$ be the probability that a household is not exposed to risk of migration.
- (2) Let the number of adult migrants from a household follows a Poisson distribution and the parameters of this distribution varies according to Lineldy distribution because there are large disparity in terms of social, economic and cultural of households.

Present in the society which affects the intensity of migration. Therefore finally we get the inflated type probability model of adult migrants which behave as a random variable. Therefore finally the adult migrants which behave as a random variable and follows a inflated type probability model in form of Poisson Lineldy distribution.

$$(2.1) P(X=x) = \begin{cases} 1-\alpha \\ \alpha \frac{\theta^2 (k+\theta+2)}{(\theta^2+3\theta+2)(\theta+1)} \end{cases}, k=1,2,3,\dots, \theta > 0.$$

This model contains two parameters α and θ . These two parameters estimated by method of moment technique and zeroth and first cell frequencies which takes the following forms of equation

$$(2.2) \quad \begin{cases} \frac{f_0}{f_1} = 1 - \alpha, \\ \frac{f_1}{f} = \alpha \left[\frac{\theta^2 (k + \theta + 2)}{(\theta^2 + 3\theta + 2)(\theta + 1)} \right], \\ E(x) = \alpha \left[\frac{(\theta + 1)^2 (\theta + 2)}{\theta (\theta^2 + 3\theta + 1)} \right], \end{cases}$$

where f_0 , f_1 , f , and $E(x)$ denotes the zeroth cell frequency, first cell frequency, total observation and mean value respectively.

3. Application of the Model

The model has been applied to the primary data taken from a survey entitled “migration and related characteristics-a case study of North-Eastern Bihar” conducted during October 2009 to June 2010. This analysis is based on the information collected from 664 households. Further, the models proposed have also been applied to other three data sets of different time and space to check its suitability. The Varanasi data was collected under a sample survey “Rural development and population growth (RDPG) survey” conducted in 1978 in Varanasi district and used by Sharma (1985) and Iwunor (1995). The Nepal data is taken from a sample survey of the Rupandhi and Palpa districts in Nepal and used by Aryal (2011)⁶. The Bangladesh data was collected under a sample survey “Impact of Migration on Fertility in Bangladesh: A study of Comilla district” conducted in 1997 and used by Hossain (2000)⁷.

4. Conclusion

The estimated value of the parameters are given in the end of tables. The value of χ^2 with degree of freedom clearly indicates that the proposed model fits the survey data and describes the distribution of the number of adult migrants from a household. The proposed model and its findings may help demographers, planners and policy makers for designing more effective and reasonable policies for the good health and environment of the society.

Number of Migrants	Observed number of household	Expected number of household
0	401	401
1	147	139.13
2	57	67.02
3	29	31.23
4	16	14.21
5	8	6.35
6	5	2.80
7	1	2.26
Total	664	664
Estimated value of parameters		X^2 (after pooling)=2.9456
		d.f =3
		α =0.3960
		θ =1.5336

Table -1.Observation and expected frequency of the number of household according to the migrants in flooded area of Kosi river.

Number of Migrants	Observed number of household	Expected number of household
0	1032	1032
1	95	88.17
2	19	28.15
3	10	8.78
4	2	2.70
5	2	0.82
6	0	0.24
7	1	0.14
Total	1161	1161
Estimated value of parameters		X^2 (after poling)=4.0944
		d.f =1
		α =0.1111
		θ =2.6830

Table -2.Observation and expected frequency of the number of household according to themigrants in Varanasi District

Number of Migrants	Observed number of household	Expected number of household
0	623	623
1	126	125.29
2	42	42.26
3	13	13.92
4	4	4.50
5	2	1.44
6	1	0.59
Total	811	811
		$X^2(\text{after poling})=0.154$
		d.f =1
Estimated value of parameters		$\alpha=.2319$
		$\theta=6.2680$

Table -3.Observation and expected frequency of the number of household according to the migrants in Nepal.

Number of Migrants	Observed number of household	Expected number of household
0	1941	1941
1	542	528.04
2	124	148.14
3	48	40.73
4	13	11.03
5	4	2.95
6	1	1.11
Total	2673	2673
		$X^2(\text{after poling})=6.1622$
		d.f =2
Estimated value of parameters		$\alpha=.0.2738$
		$\theta=3.1457$

Table -4.Observation and expected frequency of the number of household according to the migrants in Comilla District of Bangladesh.

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