International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: SJIF: 5.995
Available Online at www.journalijcar.org
Volume 6; Issue 10; October 2017; Page No. 6601-6608
DOI: http://dx.doi.org/10.24327/ijcar.2017.6608.0976

Research Article

DISTRICT BASED CLUSTERED STUDY FOR CHILD MORTALITY IN EAG STATES AND ASSAM

Mritunjay Pal Singh., Abhishek Bharti., Niraj Kumar Singh and Singh R. D

Department of Statistics, Ins. of Science Banaras Hindu University

ARTICLE INFO

Article History:

Received 10th July, 2017
Received in revised form 9th
August, 2017 Accepted 25th September, 2017
Published online 28th October, 2017

Key words:

Child Mortality, GIS, Spatial Scan Statistics, AHS, DLHS

ABSTRACT

Spatial study is the scenario to identify the spatial clusters with respect the scenario to study in our per-spective. In this study we consider it for the matter of child mortality in EAG states and Assam in Indian context such as they are the highest numbers of child mortality encountered. For the study there have some districts which have more higher amount of child mortality, with the help of spatial scan procedure we try to encounter that which districts are connected by borders geographically in that scenario and then we try to go for appropriate statistical methods to study the scenario of child mortality for appropriate data sets.

INTRODUCTION

Study of under ve mortality is a quite valuable phenomena in demography because it is the study of an important part of population. Most of the policies of any government are considered for child health. Birth order of Children is also an important factor in that phenomenon because it a ects the healths of children in several manners and also the programs for under 5 mortality a ect the birth order with all that programs which are made for health and wellbeing of children and mothers which are cause of increase in survival of children, and that will be the part of improvement of a country's Physical quality of life index(PQLI) and with the help of it must also increase the life expectancy at birth which is an important part of study of all over development within Human Development Index. That study is also keeps an important place for developing countries like India where the work on that aspect is very high.

On global level MDG gives the goal that the child mortality will try to be reduced by two third in between 2000 to 2015 by whole world which was achieved by many countries. But the worse part of not achieving is seen by most of undeveloped or developing countries of Africa and South Asia. In South Asian Countries India have valuable position. In 2015 by he review of millennium development goals India Shows its moderate speed of progress of child mortality the main cause is can be considered as most of states of India as EAG States does not covered the required target in proper manner.

Corresponding author:* **Mritunjay Pal Singh
Department of Statistics, Ins. of Science Banaras Hindu University

Arnold *et al*.(1975), Bulatoo(1981), Espenshadoc(1977), Vlaso (1979, 1990), Pollak and watkins(1993), Fredman, Hecter and kanazwa(1994) shows that the care and di erence among mortality is based on their utility in which complex interplay of economic and sociocultural factors determines the bene ts the costs of a child. In economic utility as agricultural, wage earing, old age and illness security goes in favor of son which must tend to people for having son(Manda(1972), Miller(1981), Bardhan(1988), Basu(1989)). Also Karve(1965), Kapadia(1966), Dyson and Moore(1983), Caldwell(1989), Reddy and Caldwell(1989) shows that in many countries son is consider as the asset that reimburse all the investment in the form of dowry and Girls as the liability by which the dowry os exists as an pressure(Kishor(1995)) In India Religion and caste system. Arnold *et al*(1998), shows that the preference of son over girl child may lead to short birth intervals and low rate of contraception, as it would increase more that 5% of contraception prevalence when no child sex preference occurred.

Knowledge of spatial and temporal distribution of mortality and morbidity is important to priority areas fr adjusting the public health system where people needs service most (Alam *et al*. (2010)). The risk of child dying before completing ve years of age is highest in EAG states and Assam in India for consideration understanding the impact to place, person and time on health is a key element of epidemiological investigation. With spatial methods being useful to analyze Geo referenced health related data (Auchincloss(2013)). Studies on provincial level di erential are very important and have highlighted the magnitude of childhood mortality. Kulldro (1997) suggested that Space time structure of multidimensional variation as an extension of Naus(1965)

spatial structure study and several space time studies have been made in that context to that with respect to regular and irregular shape of cluster. It has been proposed that in between a cluster that patterns are in random pattern which must go for a certain distribution de ned in that scenario.

In India multilevel government scheme is followed as villages, Districts, states and country where if we consider child mortality scenario we can de ne it on level of country on level of state and on the level of districts. In data of world health organization it has been shown India as the country of consists with highest number of children deaths. So in that condition if we go in depth we get that in India there are only some states preferably Uttar Pradesh, Madhya Pradesh, Bihar, Odisha, Rajasthan, Jharkhand, Chhatisgarh, Uttarakhand and Assam where such kind of high level mortality exists and in more depth some of districts of that states hold that high amount of child mortality scenario. The study is concerns about the proper model based study in the districts of EAG states and Assam is consists with highest number of child mortality with the help of spatial scan statistics or space time variation for it.

METHODOLOGY

Study Area

Empowered action group(EAG) States and Assam is covers a large part of Indian geographical structure, serving the population approximately half of the population of based on census of India with approximately consists with half of districts in India as 324 districts in total 706 districts which is distributed as 33 districts in Assam, 38 in Bihar, 27 in Chhatisgarh, 24 in Jahrkhand, 51 in Madhya Pradesh, 33 in Rajasthan, 30 in Odissa, 75 in Uttar Pradesh, 13 in Uttarakhand. That states located in central part of India and one state Assam is located in NOrth eastern part of India,. Data must show district wise children death in that geographical structure and locations.

Study Population

Under 5 mortality numbers or children below ve year age that had higher chance of mortality in that structure had been taken into account of study from data of AHS 2012-13 considered.

Study Units

For the study we consider the study units as the district wise under ve mortality from the data of Annual health survey 2012-13 data which had been collected for Eag states and Assam for the wide consideration of health facility scenario. by which they would be able to perform health facility in widely signi cant manner of health plan implication.

Grouping Basis

For the grouping we made consideration in such manner as:-

We consider the data on reference of National population policy 2000 for under ve mortality as reference consideration. Under ve mortality will be in EAG states such as Uttar Pradesh, Madhya Pradesh, Bihar, Odisha, Rajasthan, Jharkhand, Chhatisgarh, Uttarakhand and Assam for the study. Since high risk zone would be mainly considered for study we must take those districts which have more than 80/1000 under ve mortality.

Then we plot district wise map on the basis of the values of under ve mortality. We take of those districts in our group as there may be 3 or more geographically connected districts as plotted on map.

Since we have cluster de ned in homogeneous nature so we try to nd that is we can go for any probabilistic model or not, for that we use the scenario of number of children death as cases and number of children survived more than 5 year as control and total children as population variable, So we get the total number of possible outcome that cases and control out of n number of total population. For that the most proper distribution which is de ned as bi-nomial distribution. For nding the risk scenario cluster wise we move to likelihood function and consider T such as:-

$$T = \max \quad \frac{c}{n}\ c\ \frac{n\ c}{n}\ n\,c\ \ \frac{C\ c}{N\ n}\ C\,c\ \ \frac{(N\ \ n)\ \ (C\ \ c)}{N\ \ n}\ N\,n)\ (C\,c) \qquad (1)$$

where C is total number of cases, C is the observed number of cases within the cluster. n is the total number of cases and control within cluster, N is the combined total of cases and control within the data set. Which have been tested up to 1000 simulation maximization process by the method of Monte Carlo Simulation structure for the study of under ve mortality in considered scenario. Which was given by de ned be metropolis(1953). For more of it now we move to results section.

RESULTS

For the grouping purpose for our study we use the data of 2013 annual health survey data in light of national population policy consideration 2000 and millennium development goals study. Then for our de ned criteria we get the districts lies in that structure.

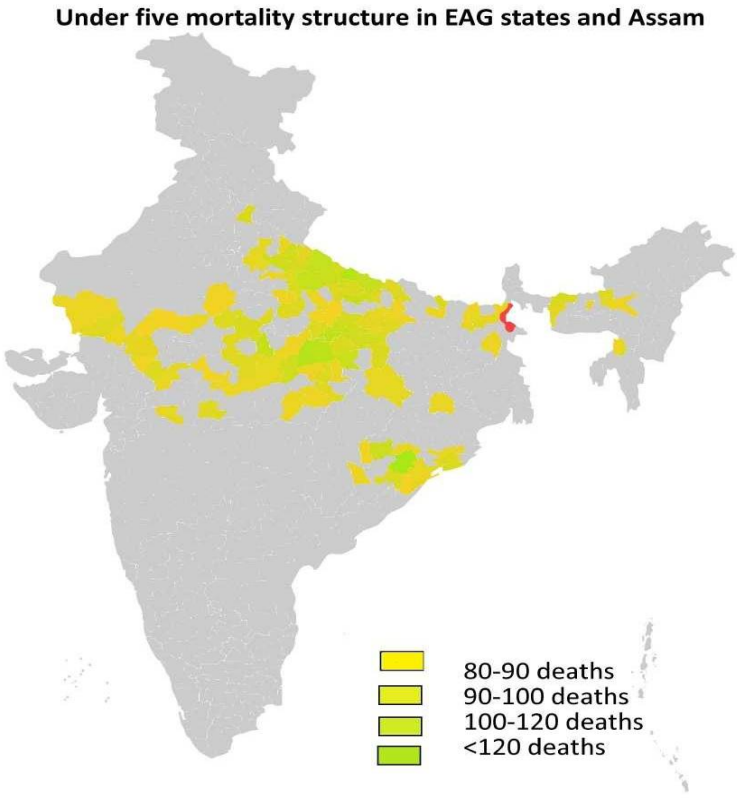
Table 1 Districts lies in study

State	Districts	Under 5 deaths	State	Districts	Under 5 deaths
Assam	Chirang	100	Orissa	Nabarangapur	83
Assam	Darrang	95	Orissa	Nuapada	80
Assam	Dhubri	89	Orissa	Puri	101
Assam	Hailakandi	98	Orissa	Rayagada	98
Assam	Karimganj	80	Rajasthan	Banswara	95
Assam	Kokrajhar	100	Rajasthan	Barmer	85
Assam	Morigaon	85	Rajasthan	Bhilwara	80
Assam	Nagaon	82	Rajasthan	Bundi	85
Assam	Nalbari	84	Rajasthan	Dausa	82
Assam	Udalguri	95	Rajasthan	Dungarpur	81
Bihar	Khagaria	95	Rajasthan	Jalor	94
Bihar	Kishanganj	84	Rajasthan	Karauli	81
Bihar	Madhopura	92	Rajasthan	Rajsamand	80
Bihar	Muza arpur	84	Rajasthan	Sawai Madhopur	80
Bihar	Purnia	91	Rajasthan	Sirohi	85
Bihar	Saharsa	82	Rajasthan	Udaipur	91
Bihar	Sitamarhi	97	Uttar Pradesh	Aligarh	90
Bihar	Supaul	82	Uttar Pradesh	Allahabad	104
Chattisgarh	Jashpur	92	Uttar Pradesh	Auraiya	84
Chattisgarh	Surguja	90	Uttar Pradesh	Azamgarh	89
Jharkhand	Godda	85	Uttar Pradesh	Bahraich	105
Jharkhand	Pakur	81	Uttar Pradesh	Ballia	82

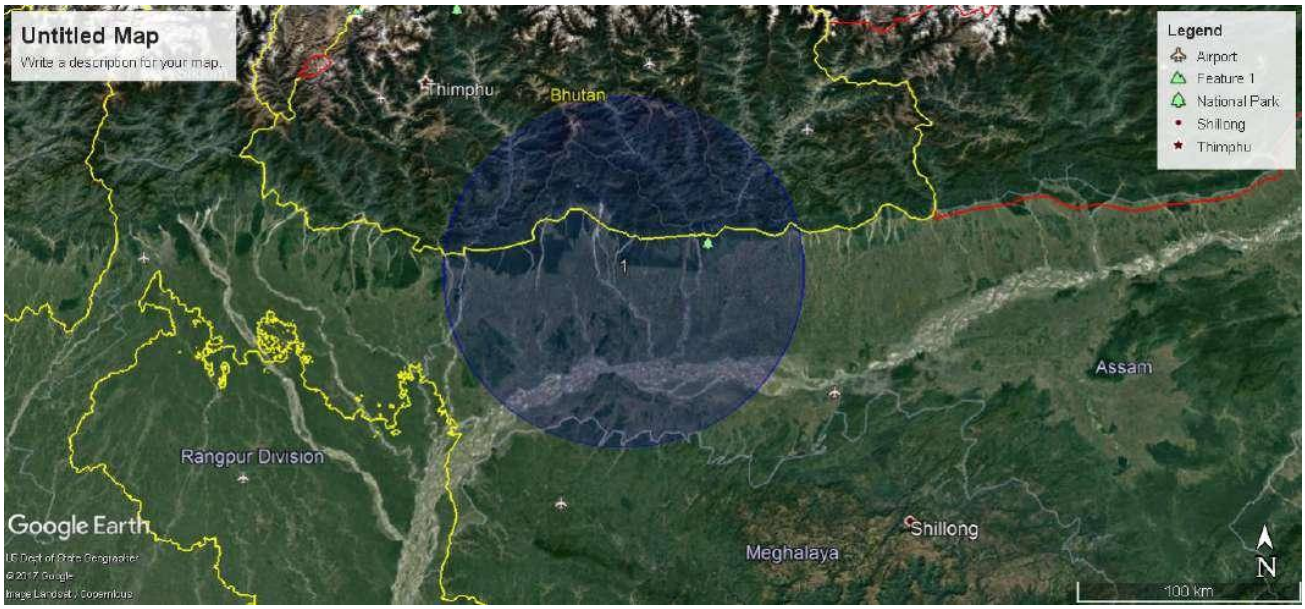
Table 2 Districts lies in our criteria

State	Districts	Under 5 deaths	State	Districts	Under 5 deaths
Jharkhand	Paschimi Singhbhum	86	Uttar Pradesh	Balrampur	117
Jharkhand	Sahibganj	83	Uttar Pradesh	Banda	96
Madhya Pradesh	Barwani	89	Uttar Pradesh	Bara Banki	97
Madhya Pradesh	Damoh	106	Uttar Pradesh	Bareilly	104
Madhya Pradesh	Datia	94	Uttar Pradesh	Basti	106
Madhya Pradesh	Dindori	95	Uttar Pradesh	Budaun	108
Madhya Pradesh	East Nimar	94	Uttar Pradesh	Bulandshahr	89
Madhya Pradesh	Guna	93	Uttar Pradesh	Chandraili	98
Madhya Pradesh	Jhabua	86	Uttar Pradesh	Chitrakoot	119
Madhya Pradesh	Katni	83	Uttar Pradesh	Deoria	83
Madhya Pradesh	Mandla	84	Uttar Pradesh	Etah	86
Madhya Pradesh	Panna	127	Uttar Pradesh	Etawah	85
Madhya Pradesh	Raisen	88	Uttar Pradesh	Faizabad	115
Madhya Pradesh	Ratlam	92	Uttar Pradesh	Farrukhabad	98
Madhya Pradesh	Rewa	100	Uttar Pradesh	Fatehpur	81
Madhya Pradesh	Sagar	92	Uttar Pradesh	Ghazipur	94
Madhya Pradesh	Satna	121	Uttar Pradesh	Gonda	97
Madhya Pradesh	Sehore	84	Uttar Pradesh	Hardoi	118
Madhya Pradesh	Seoni	85	Uttar Pradesh	Jalaun	97
Madhya Pradesh	Shahdol	85	Uttar Pradesh	Jaunpur	91
Madhya Pradesh	Shajapur	80	Uttar Pradesh	Jyotiba Nagar	92
Madhya Pradesh	Sheopur	98	Uttar Pradesh	Kannauj	102
Madhya Pradesh	Shivpuri	100	Uttar Pradesh	Kanpur Dehat	94
Madhya Pradesh	Sidhi	112	Uttar Pradesh	Kaushambi	113
Madhya Pradesh	Tikamgarh	84	Uttar Pradesh	Kheri	117
Madhya Pradesh	Umaria	99	Uttar Pradesh	Kushinagar	99
Madhya Pradesh	Vidisha	94	Uttar Pradesh	Lalitpur	114
Orissa	Balangir	111	Uttar Pradesh	Mahraganj	96
Orissa	Baudh	85	Uttar Pradesh	Mau	86
Orissa	Cuttack	85	Uttar Pradesh	Mirzapur	105
Orissa	Gajapati	81	Uttar Pradesh	Pilibhit	91
Orissa	Ganjam	87	Uttar Pradesh	Pratapgarh	104
Orissa	Kandhamal	139	Uttar Pradesh	Rae Bareli	80
Orissa	Khordha	96	Uttar Pradesh	Rampur	86
Uttar Pradesh	SKN	91	Uttar Pradesh	Siddharthnagar	116
Uttar Pradesh	SRNB	106	Uttar Pradesh	Sitapur	114
Uttar Pradesh	Saharanpur	99	Uttar Pradesh	Sonbhadra	99
Uttar Pradesh	Shahjahanpur	100	Uttar Pradesh	Unnao	83
Uttar Pradesh	Shrawasti	130	Uttar Pradesh	Varanasi	90

Now plotting that data on geographical map of India we get such as;-



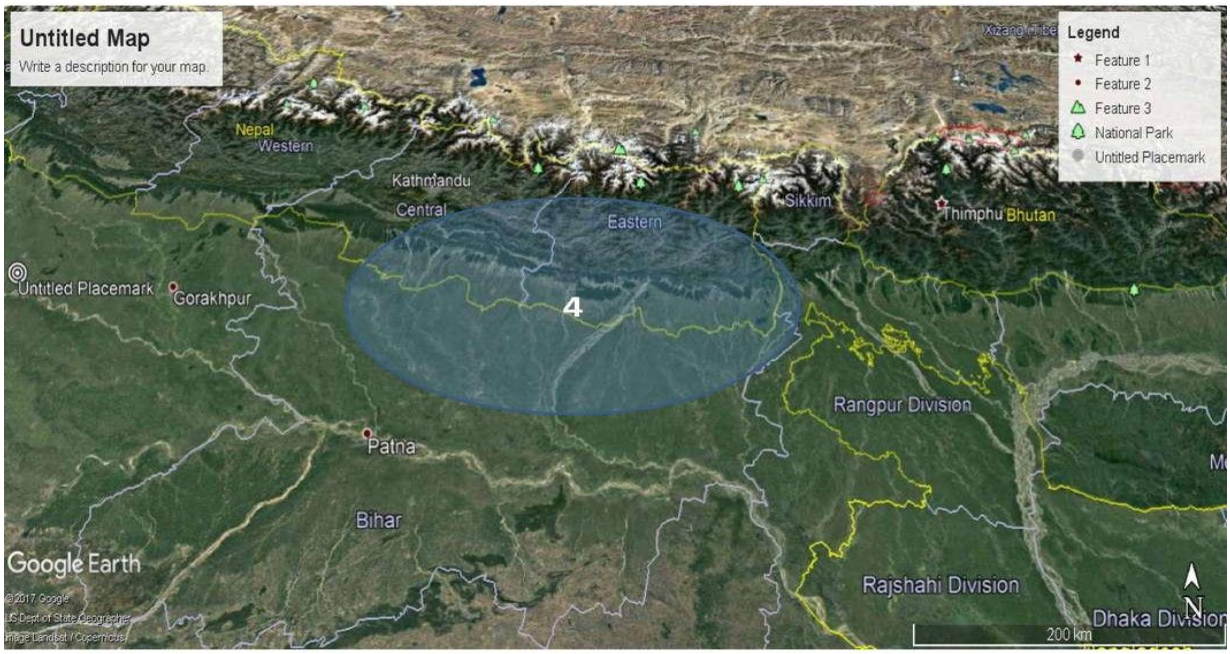
From the map of our de ned criteria to be group we get six groups of districts connected such as: Group -1



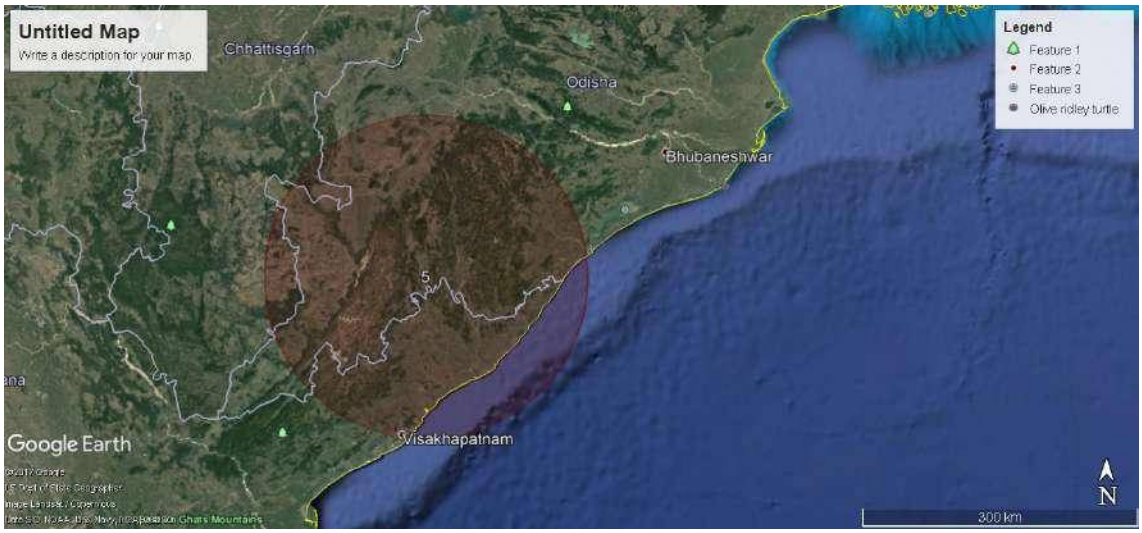
Group 1

Group 2

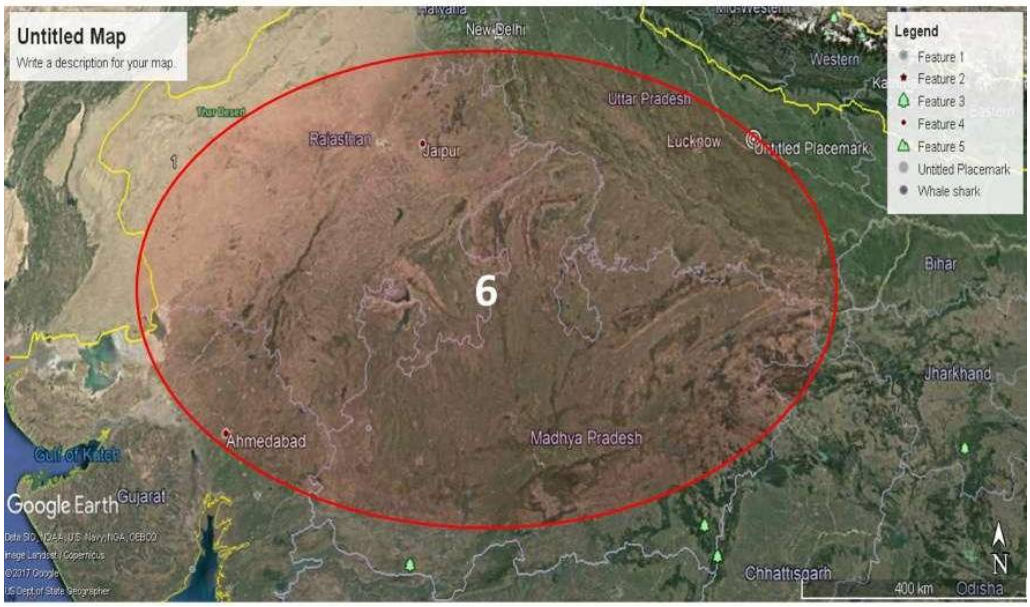
Group 3



Group 4



Group 5



Group 6

with di erent sizes in which 2 groups are of size 3, one is of size 4, 1 is of size 6, 1 of size 11, 1 of size 78. total 105 districts out of 112 districts given as in tables.

There are 7 districts which are remain non grouped it as given for corresponding under ve mortality.

Table 3 Districts which are not in any group

State	Districts	Under 5 deaths
Assam	Hailakandi	98
Assam	Karimganj	80
Assam	Nalbari	84
Jharkhand	Paschimi Singhbhum	86
Bihar	Sitamarhi	97
Bihar	Muza arpur	84
Madhya Pradesh	East Nimar	94

Table 4 group 1

State	Districts	Under 5 deaths
Assam	Kokrajhar	100
Assam	Dhubri	89
Assam	Chirang	100

Table 5 group 2

State	Districts	Under 5 deaths
Assam	Morigaon	85
Assam	Nagaon	82
Assam	Darrang	95
Assam	Udalguri	95

Table 6 group 3

State	Districts	Under 5 deaths
Jharkhand	Sahibganj	83
Jharkhand	Godda	85
Jharkhand	Pakur	81

Table 7 group 4

State	Districts	Under 5 deaths
Bihar	Khagaria	95
Bihar	Kishanganj	84
Bihar	Madhopura	92
Bihar	Purnia	91
Bihar	Saharsa	82
Bihar	Supaul	82

Table 8 group 5

State	Districts	Under 5 deaths
Orissa	Balangir	111
Orissa	Baudh	85
Orissa	Cuttack	85
Orissa	Gajapati	81
Orissa	Ganjam	87
Orissa	Kandhamal	139
Orissa	Khordha	96
Orissa	Nabarangapur	83
Orissa	Nuapada	80
Orissa	Puri	101
Orissa	Rayagada	98

Moving to the consideration of risk of death within the clusters to the for the cases and control scenario out of total numbers we apply the binomial risk study for it so for that we have number of cases and control scenario from DLHS -3 data such as-:

Table 9 group 6

State	Districts	Under 5 deaths	State	Districts	Under 5 deaths
Chattisgarh	Jashpur	92	Uttar Pradesh	Allahabad	104
Chattisgarh	Surguja	90	Uttar Pradesh	Auraiya	84
Chattisgarh	Balrampur	92	Uttar Pradesh	Azamgarh	89
Madhya Pradesh	Damoh	106	Uttar Pradesh	Bahraich	105
Madhya Pradesh	Datia	94	Uttar Pradesh	Ballia	82
Madhya Pradesh	Dindori	95	Uttar Pradesh	Balrampur	117
Madhya Pradesh	Guna	93	Uttar Pradesh	Banda	96
Madhya Pradesh	Jhabua	86	Uttar Pradesh	Bara Banki	97
Madhya Pradesh	Katni	83	Uttar Pradesh	Bareilly	104
Madhya Pradesh	Mandla	84	Uttar Pradesh	Basti	106
Madhya Pradesh	Panna	127	Uttar Pradesh	Budaun	108
Madhya Pradesh	Raisen	88	Uttar Pradesh	Bulandshahr	89
Madhya Pradesh	Ratlam	92	Uttar Pradesh	Chandraili	98
Madhya Pradesh	Rewa	100	Uttar Pradesh	Chitrakoot	119
Madhya Pradesh	Sagar	92	Uttar Pradesh	Deoria	83
Madhya Pradesh	Satna	121	Uttar Pradesh	Etah	86
Madhya Pradesh	Sehore	84	Uttar Pradesh	Etawah	85
Madhya Pradesh	Seoni	85	Uttar Pradesh	Faizabad	115
Madhya Pradesh	Shahdol	85	Uttar Pradesh	Farrukhabad	98
Madhya Pradesh	Shajapur	80	Uttar Pradesh	Fatehpur	81
Madhya Pradesh	Sheopur	98	Uttar Pradesh	Ghazipur	94
Madhya Pradesh	Shivpuri	100	Uttar Pradesh	Gonda	97
Madhya Pradesh	Sidhi	112	Uttar Pradesh	Hardoi	118
Madhya Pradesh	Tikamgarh	84	Uttar Pradesh	Jalaun	97
Madhya Pradesh	Umaria	99	Uttar Pradesh	Jaunpur	91
Madhya Pradesh	Vidisha	94	Uttar Pradesh	Jyotiba Nagar	92
Rajasthan	Banswara	95	Uttar Pradesh	Kannauj	102
Rajasthan	Barmer	85	Uttar Pradesh	Kanpur Dehat	94
Rajasthan	Bhilwara	80	Uttar Pradesh	Kaushambi	113
Rajasthan	Bundi	85	Uttar Pradesh	Kheri	117
Rajasthan	Dausa	82	Uttar Pradesh	Kushinagar	99
Rajasthan	Dungarpur	81	Uttar Pradesh	Lalitpur	114
Rajasthan	Jalor	94	Uttar Pradesh	Mahraganj	96
Rajasthan	Karauli	81	Uttar Pradesh	Mau	86
Rajasthan	Rajsamand	80	Uttar Pradesh	Mirzapur	105
Rajasthan	Sawai Madhopur	80	Uttar Pradesh	Pilibhit	91
Rajasthan	Sirohi	85	Uttar Pradesh	Pratapgarh	104
Rajasthan	Udaipur	91	Uttar Pradesh	Rae Bareli	80
Uttar Pradesh	Aligarh	90	Uttar Pradesh	Rampur	86
Uttar Pradesh	SKN	91	Uttar Pradesh	Siddharthnagar	116
Uttar Pradesh	SRNB	106	Uttar Pradesh	Sitapur	114
Uttar Pradesh	Saharanpur	99	Uttar Pradesh	Sonbhadra	99
Uttar Pradesh	Shahjahanpur	100	Uttar Pradesh	Unnao	83
Uttar Pradesh	Shrawasti	130	Uttar Pradesh	Varanasi	90

Table 10 Cases and Controls of EAG states and Assam

State	Districts	death	survived	births
Assam	Chirang	168	927	1095
Assam	Darrang	137	720	857
Assam	Dhubri	227	856	1083
Assam	Hailakandi	380	803	1183
Assam	Karimganj	420	801	1221
Assam	Kokrajhar	157	832	989
Assam	Morigaon	208	877	1085
Assam	Nagaon	209	884	1093
Assam	Nalbari	136	876	1012
Assam	Udalguri	180	703	883
Bihar	Khagaria	403	839	1242
Bihar	Kishanganj	438	836	1274
Bihar	Madhopura	389	834	1223
Bihar	Muza arpur	298	621	919
Bihar	Purnia	390	749	1139
Bihar	Saharsa	289	741	1030
Bihar	Sitamarhi	421	745	1166
Bihar	Supaul	390	903	1293

Chattisgarh	Jashpur	337	946	985
Chattisgarh	Surguja	329	807	1136
Jharkhand	Godda	116	1063	1179
Jharkhand	Pakur	298	743	1041
Jharkhand	Paschimi Singhbhum	282	840	1122
Jharkhand	Sahibganj	217	837	1054
Madhya Pradesh	Barwani	247	667	914
Madhya Pradesh	Damoh	298	592	890
Madhya Pradesh	Datia	419	615	1034
Madhya Pradesh	Dindori	235	622	857
Madhya Pradesh	East Nimar	170	710	880
Madhya Pradesh	Guna	266	737	1003
Madhya Pradesh	Jhabua	254	591	845
Madhya Pradesh	Katni	292	572	864

Table 11 Cases and Controls of EAG states and Assam

Madhya Pradesh	Mandla	249	659	908
Madhya Pradesh	Panna	359	604	963
Madhya Pradesh	Raisen	397	675	972
Madhya Pradesh	Ratlam	158	580	738
Madhya Pradesh	Rewa	476	744	1220
Madhya Pradesh	Sagar	278	791	1069
Madhya Pradesh	Satna	285	651	936
Madhya Pradesh	Sehore	315	717	1032
Madhya Pradesh	Seoni	197	623	820
Madhya Pradesh	Shahdol	297	675	972
Madhya Pradesh	Shajapur	210	570	780
Madhya Pradesh	Sheopur	325	439	764
Madhya Pradesh	Shivpuri	354	595	949
Madhya Pradesh	Sidhi	514	734	1248
Madhya Pradesh	Tikamgarh	452	654	1106
Madhya Pradesh	Umaria	417	647	1064
Madhya Pradesh	Vidisha	322	689	1011
Orissa	Balangir	139	477	616
Orissa	Baudh	210	458	668
Orissa	Cuttack	207	705	912
Orissa	Gajapati	319	608	927
Orissa	Ganjam	234	543	779
Orissa	Kandhamal	251	353	604
Orissa	Khordha	164	670	834
Orissa	Nabarangapur	259	561	820
Orissa	Nuapada	180	556	736
Orissa	Puri	217	754	971
Orissa	Rayagada	357	516	873
Rajasthan	Banswara	120	854	974
Rajasthan	Barmer	263	992	1155
Rajasthan	Bhilwara	178	798	976
Rajasthan	Bundi	232	685	917
Rajasthan	Dausa	322	893	1215
Rajasthan	Dungarpur	163	952	1115
Rajasthan	Jalor	287	1001	1288
Rajasthan	Karauli	325	807	1132
Rajasthan	Rajsamand	168	912	1080
Rajasthan	Sawai Madhopur	285	815	1100
Rajasthan	Sirohi	305	873	1178
Rajasthan	Udaipur	153	968	1121
Uttar Pradesh	Aligarh	398	683	1081
Uttar Pradesh	Allahabad	518	826	1344
Uttar Pradesh	Auraiya	397	666	1063
Uttar Pradesh	Azamgarh	317	821	1138

Table 12 Cases and Controls of EAG states and Assam

Uttar Pradesh	Bahraich	529	729	1258
Uttar Pradesh	Ballia	301	698	999
Uttar Pradesh	Balrampur	542	749	1291
Uttar Pradesh	Banda	430	676	1106
Uttar Pradesh	Bara Banki	393	632	1016
Uttar Pradesh	Bareilly	489	837	1326
Uttar Pradesh	Basti	490	900	1390
Uttar Pradesh	Budaun	625	732	1357
Uttar Pradesh	Bulandshahr	366	695	1061
Uttar Pradesh	Chandraili	300	684	984
Uttar Pradesh	Chitrakoot	476	687	1163
Uttar Pradesh	Deoria	220	728	948
Uttar Pradesh	Etah	468	608	1076
Uttar Pradesh	Etawah	360	693	1053
Uttar Pradesh	Faizabad	332	556	888
Uttar Pradesh	Farrukhabad	570	782	1352
Uttar Pradesh	Fatehpur	402	589	991
Uttar Pradesh	Ghazipur	357	795	1152
Uttar Pradesh	Gonda	352	596	948
Uttar Pradesh	Hardoi	587	725	1312
Uttar Pradesh	Jalaun	338	627	965
Uttar Pradesh	Jaunpur	325	734	1059
Uttar Pradesh	Jyotiba Nagar	443	834	1277
Uttar Pradesh	Kannauj	512	772	1284
Uttar Pradesh	Kanpur Dehat	201	564	765
Uttar Pradesh	Kaushambi	600	697	1297
Uttar Pradesh	Kheri	599	754	1353
Uttar Pradesh	Kushinagar	340	642	982
Uttar Pradesh	Lalitpur	431	599	1030
Uttar Pradesh	Mahraganj	450	789	1239
Uttar Pradesh	Mau	288	763	1051
Uttar Pradesh	Mirzapur	419	729	1148
Uttar Pradesh	Pilibhit	479	784	1263
Uttar Pradesh	Pratapgarh	349	642	991
Uttar Pradesh	Rae Bareli	435	654	1089
Uttar Pradesh	Rampur	478	802	1280
Uttar Pradesh	SKN	342	761	1103
Uttar Pradesh	SRNB	499	834	1333
Uttar Pradesh	Saharanpur	349	678	927
Uttar Pradesh	Shahjahanpur	548	743	1291
Uttar Pradesh	Shrawasti	559	723	1282
Uttar Pradesh	Siddharthnagar	485	675	1160
Uttar Pradesh	Sitapur	529	754	1283
Uttar Pradesh	Sonbhadra	360	649	1009
Uttar Pradesh	Unnao	316	517	833
Uttar Pradesh	Varanasi	317	772	1089

Now going for the risk consideration we get results of binomial risk is in such manner given below:-

Table 13 Binomial risk with p values cluster wise

Clusters	Relative Risk	p value
Cluster -1	0.46	0
Cluster -2	0.94	0
Cluster -3	0.49	0
Cluster -4	1.16	0
Cluster -5	0.68	0
Cluster -6	1.23	0.005

From the table we get that the relative risk of death in clusters 1 of cases with respect to control is 0.46 with corresponding p-value 0, For cluster 2 we nd with respect to cases relative risk is 0.94 with p value 0. For cluster 3 we get relative risk with respect to controls for cases we get 0.49 with p value. When we take cluster 4 we get the relative risk of cases is 1.16 with respect to controls with p value 0. For Cluster 5 the relative risk of death is 0.68 for cases with respect to controls on p value 0. at last in cluster 6 we get the 1.23 value of relative risk for cases with respect to controls with p value 0.005. Now For more clari cation we move to discussions and conclusion Section.

DISCUSSIONS AND CONCLUSION

From the study we nd that there are so many districts in EAG states and Assam which have higher risk of children death in which from the graphical implication we found that most of

the districts which are in concern are from 3 main states out of 9 states considered as Rajasthan, Madhya Pradesh, Uttar Pradesh which make biggest group for the under ve mortality since the group criteria is de ned for being a cluster is it should be homogeneous in within the groups since it have a proper basis to be in a group so must be assumed to homogeneous within the group, and inhomogeneous between the groups. In which we applied binomial risk scenario for know that is any probabilistic or deterministic technique can be applied or not.

From the risk table of binomial risk we found that the risk of deaths can be easily visualize that is high in cluster 4 and 6 rather than other clusters and in about to similar direction cluster 2 moves with correspondingly with high risk. Cluster 2 contains Assam districts which shows high risk of children death. cluster 4 contains the districts of Bihar in which high risk of children death is observed. In cluster 6 we found highest risk of children deaths which contains the districts of Rajasthan, Madhaya Pradesh, Uttar Pradesh and Chhatishgarh. Since we get all risk coe cient are signi cant then we get the result that any statistical modeling scenario can be considered for that study.

The study is to identify the hot spot zones for our scenario to which are about to main concern and more coverage and accessibility to the services, comfort to improving the situation of that place if it is considered for some of that factors which are considered as the negative factor of population development and health situation in the population with appropriate statistical procedure for the study.

References

1. Arnold, Fred, Rodolfo A. Bulatao, Chalio Buripakdi, Betty Jamie Chung, James T. Fawcett, Toshio Iritani, Sung Jin Lee, and Tsong-shien Wu. 1975. The Value of Children: A Cross- National Study, Introduction and Comparative Analysis, Volume 1. Honolulu: East-West Center.
2. Auchincloss A. H., Gebreab S. Y., Mair C. and Diez Roux A. V., A Review of Spatial Methods in Epidemi-ology, 2000-2010, AnnuRev Public Health, vol. 33, pp. 107-122, 2013
3. Alam, N., Haq M. Z. and Streat eld, P. K.(2010), Spatio-temporal patterns of under- ve mortality in Matlab HDSS in rural Bangladesh, Global Health Action 2010
4. Arnold, B. C. (1975a), "A Characterization of the Exponential Distribution by Multivariate Geometric Com-pounding," Sankhya, Ser. A, 37, 164-173. (1975b), "Multivariate Exponential Distributions Based on Hier-archical Successive Damage," *Journal of Applied Probability*, 12, 142-147
5. Arnold BC (1993) Pareto Distributions. Vol.5 in statistical distribution, Fairland (MD), International Co-operative Publishing house.
6. Bulatao, Rodolfo A. 1981. "Values and disvalues of children in successive childbearing decisions", Demogra-phy 18: 1-25.
7. Bardhan, Pranab K. 1988. "Sex disparity in child survival in rural India", in T. N. Srinivasan and P. K. Bardhan (eds.), Rural Poverty in South India. Oxford: Oxford University Press
8. Basu, Alaka M. 1989. "Is discrimination in food really necessary for explaining sex di erentials in childhood mortality?", Population Studies 43: 193-210.
9. Caldwell, John C., P. H. Reddy, and Pat Caldwell. 1989. The Causes of Demographic Change: Experimental Research in South India. Madison: University of Wisconsin Press.
10. Dyson, Tim and Mick Moore. 1983. "On kinship structure, female autonomy and demographic balance", Population and Development Review 9: 35-60.
11. Espenshade, Thomas J. 1977. "The value and cost of children", Population Bulletin 32: 3-47.
12. Friedman, Debra, Michael Hechter, and Satoshi Kanazawa. 1994. "A theory of the value of children", De-mography 31: 375-401.
13. International institute of population studies (2005-06), National family health survey of India Report, Mum-bai, India, IIPS
14. Kapadia, K. M. 1966. Marriage and Family in India. 3rd edition. Bombay: Oxford University Press.
15. Karve, I. 1965. Kinship Organization in India: Bombay: Asia Publishing House.
16. Kulldor M. Information Management Services, software for the spatial and space time scan statistics; 2006.
17. Kulldor M.(1997), A Spatial Scan statistics, Communication statistics, Theory and methods, 26(6)1481-1496
18. Miller, Barbara D. 1981. The Endangered Sex: The Neglect of Female Children in r ural North India. Ithaca: Cornell University Press.
19. Manda, S.O.M. (1999). Birth intervals, breastfeeding and determinants of childhood mortality in Malawi, Social Science and Medicine 48(3): 301-312.
20. Naus, J. (1965a), The distribution of Maximum cluster of points on the line, *Journal of American statistical Association*, 60,532-538
21. Naus, J. (1965b) Clustering of random points in two dimensions, biometrika 52, 263-267
22. ce of the Registrar General and Census Commissioner, India, Ministry of Home A airs, Government of India
23. Pollak, Robert A. and Susan Cotts Watkins. 1993. "Cultural and economic approaches to fertility: Proper marriage or mesalliance", Population and Development Review 19: 467-496.
24. United Nations Millennium Project, Investing in Development: A Practical Plan to Achieve the Millennium Development Goals (Main Report). (2005). United Nations: New York
25. Vlaso, Carol. 1990. "The value of sons in an Indian village: How widows see it", Population Studies 44: 5-20.
26. Vlaso, Michael. 1979. "Labour demand and economic utility of children: A case of rural India", Population Studies 33: 415-428.

****