Socio-economic Factors Influencing Infant and Child Mortality among the Zou of Manipur

*Gin Khan Khual**
*D.K. Limbu***

Abstract

The present study was conducted to find out the influence of socio-economic factors on infant and child mortality among the Zou, a tribal population of Manipur. A cross-sectional study was executed among 533 mothers of age 17- 49 years following house to house visits from December 2016 to February 2017. The finding shows there is a significant correlation of the educational level of the mother, household income, child immunization to that of infant and child mortality in the study population. It also shows that mother's occupation, self-assessment of the mother health, ANC visits and consumption of iron follicle shows significant variance with respect to infant and child mortality.

KEYWORDS: influence, socio-economic factors, infant and child mortality, tribal, Zou

Introduction

The vulnerability of exposure to various diseases especially during the early stage of life in a human being is apprehensive for the wellbeing of the individual concerned in order to face the new challenges ahead. As the immature and tender immune system gradually develops in infant and child to progressive established adaptation, the insusceptible limitation to struggle and to overcome circumscribed environmental influences is another hindrance for the development of the body.

The influence of socio-economic factors on raising children is also another feature that can contribute tremendous transformation in course of time to determine their longevity. According to **"**Save the Child" about 5.5 million babies born each year and die without being recorded. The incidence of infant death is inevitable but the

overwhelming majority of these deaths are easily preventable (Carroll, 2014). As per the Economic Survey Report 2014-15, despite Delhi, being the National capital of India, it is astonishing to know that one in every 45 kids here demise without seeing her/his first birthday (Jha, 2015). Infant mortality is a domineering contemporary issue which has been frequently associated with high poverty, low level of education and deficient healthcare system on the other.

Kabir et al., (1995) define infant mortality as death during the first year of life and child mortality as death during the age of 1 to 4 years. UNICEF also define infant mortality rate as "the probability of dying between birth and exactly one year of age expressed per 1000 live births". On the other hand, child mortality is "the probability of dying between birth and exactly five years of age expressed per 1000 live births". Raza and Nangia (1984) define infant mortality rate as the ratio of infant deaths recorded in a given year to the total number of live births registered in the same year: usually expressed as a rate per 1000 live birth. Child mortality rate, on the other hand, is the number of deaths of children aged 1 to 4 years per 1000 children in the same age group in a given year.

Problemque

Mortality is an important demographic characteristic feature determining the growth of populations. There are numerous reasons for determining childhood mortality; determining child mortality here means measures of risks of dying up to the age when such risks reach their minimum values. Infant and child mortality is often used as a broad indicator of socio-economic development. Measures of childhood mortality are necessary for making population projections. Information on trends, both national and disaggregated, is used to evaluate the impact of interventions. There are instances where health care services provided by the government do not reach remote areas. This deprivation leads to the rise in infant and child mortality which could have been avoided. Though there is a considerable number of researches that have been done in various parts of the country on proximity of infant and child mortality, yet there are many isolated

socio-economic groups in North- East India which are yet to be explored.

Although the occurrence of infant and child mortality rate is widely accepted index for estimating socio-economic development and a reflection of a country's health care system and quality of life, most of the researches particularly government health collaborative projects, done in this field lack in-depth studies. As the information's are heavily based on secondary sources, they fail to explain the causes and effects at the micro level. Hence, the observation does not truly reflect the real scenario especially among the remote areas where there is lack of health awareness and medical facilities.

Though there are studies on infant and child mortality among various communities of North-East India, so far no reports are available on the influence of socio-economic factors on infant and child mortality of the Zou community of Manipur. Behiang is located at the extremely remote area of Churachandpur District, bordering to Myanmar. It is about 60 kilometers from the main town (Lamka). Majority of the people living in this area engaged in agricultural activities for sustenance. Marginal income and lack of decent educational facilities added fuel to their difficulties. As it is located in the hilly regions along the international boundary, proper infrastructure and various modern facilities are not easily accessible. Considering all these factors, we decided to select this region to study the socio-economic factors that may influence and contribute to the causes of infant and child mortality.

On the other hand, the people residing in Churachandpur (Lamka) town are expected to be more literate, well educated, aware of modern healthcare facilities, richer and having better access to medical services, etc. consequently, they are expected to be more conscious about their health and have been taking much more concern for their children than those living in the remote villages of Behiang. It will be interesting to observe the prevailing situation within the same tribe residing at different geographical locations.

The People

The Zou belong to Mongolian micro-ethnic populations which in turn are classified by linguists under Sino-Tibetan families. It belongs to the Northern branch of the Kuki-Chin-Lushai/Mizo subfamily speaking Tibeto-Burman language. Speakers of Zou belong to the "Zomi" macro-ethnic community (Pandey, 2010). The Zou/Zo literally means "Highlanders" or "hilly" is officially recognized as one of the indigenous Schedule Tribe of Manipur mostly concentrated in Chandel and Churanchdpur District. According to the 2011 census, the population is estimated to be approximately 25,000 people. Like their ethnic Mizo cousins, the Zou is a tribal Christian community undergoing profound social change and modernization since the mid-twentieth century (Zou, 2009).

The staple food of the Zou is rice. Storing dry vegetables for winter supplement is very common. In rural areas, the primary occupation of the Zous is agriculture. Shifting cultivation is widely practiced. In the town, the Zou people mostly engage in small business, public and government sectors. In regard to marriage, the Zou community generally follows what is called as "patrilineal cross-cousin's marriage" which is their first choice known to them as *Neila* (Zomi, 2014).

Objectives

1. To study a comparative analysis of the influence of socio-economic factors on infant and child mortality in Behiang villages and Lamka town.
2. To study the correlations between awareness of health facilities, ANC visits during pregnancy with respect to that of infant and child mortality in both rural and urban areas.

Materials and methods

Selection of the Sample Localities

The fieldwork for the present study has been conducted among the Zous mothers within the reproductive age group between

17- 49 years from Singngat sub-division and Lamka town, the Headquarter of Churanchandpur District, Manipur. Collection of data was conducted from January 2016 to February 2017. A cross-sectional study was executed based on a structured schedule. The interview was held following house to house visit. In the first phase, 9 of the 28 villages inhabited by the Zous in Behiang areas' *viz*., Behiang V, Behiang T, Behiang H, Suangphu, Pakmual, T. Sehken, Jangnuam, Tonjang and L. Cannan within Singngat sub-division has been selected base on their remoteness of location along the frontier bordering to Myanmar away from the town. The entire villages yield about 231 households. In Lamka town, data collection was executed among the Zou localities viz. Zoveng, New Zoveng Hiangzou, Zoumunnuam and Zomi Colony as they are centrally located to the town. The present study yielded about 302 households from the town. The study also includes household income that has been organized according to percentiles.

A comparative analysis of Behiang villages representing rural population and Lamka town representing the urban population of the same tribe living in different geographical location has been studied to examine if there is any significant difference in the incidence of infant and child mortality and the conceivable reason for the same.

Statistical Analysis

Apart from calculating manually, most of the analyses were done in MS-excel software (Microsoft Company, 2010 version) and IBM developed software SPSS version 20.

Results

The influence of socio-economic factors inducing infant and child mortality among the Zou could be described in the following tables as shown below-

Table 1: Infant and child mortality by types of family

Types of Family	***Behiang***			***Lamka***		
	Frequency	***Live birth***	***Infant & child mortality (%)***	***Frequency***	***Live birth***	***Infant & child mortality (%)***
Nuclear Joint	14487	4863	29 (5.96) 14 (4.54)	21983	61524	31 (5.04) 6 (2.46)
Chi square (χ^2)	0.5241 df= 1 , p> 0.1			2.1613 df=1 p> 0.1		

Table 1 shows the frequency distribution of infant and child mortality base on the type of family they belong to. The occurrence of infant and child mortality rate among the nuclear family is higher (5.96%) as compared to that of the joint family (4.54%) in the rural population. The urban population also shows that the nuclear family has a higher (5.04%) infant and child mortality rate as compared to that of the joint family (2.46%). However, Chi-square test between nuclear and joint family with respect to the number of infants and child mortality in both rural (χ^2=0.5241, df= 1, p> 0.1) and urban (χ^2 =2.1613, df=1, p> 0.1) shows that it is statistically insignificant.

Table 2: Infant and child mortality by size of the family

Family size	***Live birth***	***Mortality rate per 100 live birth***		
		Infant (%)	***Child (%)***	***Total (%)***
Behiang				
Small	143	7 (4.89)	2 (1.39)	9 (6.29)
Medium	253	11 (4.35)	4 (1.58)	15 (5.93)
Large	398	10 (2.51)	9 (2.26)	19 (4.77)

Correlation coefficient (r)		.031	.101	.093
Lamka				
Small	151	6 (3.97)	2 (1.32)	8 (1.55)
Medium	375	13 (3.46)	6 (1.60)	19 (5.06)
Large	333	4 (1.20)	6 (1.08)	10 (3.00)
Correlation coefficient (r)		.013	.112	.073

Table 2 highlights the prevalence of infant and child mortality by sized of the family member in a household. The prevalence of infant mortality rate is found to be highest (4.89%) in small family sized followed by medium (4.35%) and the least (2.51%) is found in a large family in the rural population. In the urban population, a similar trend is found to be prevalent among small (3.97%) medium (3.466%) and large (1.20%) family sized. In case of child mortality rate, the occurrence is highest (2.26%) in the large family followed by medium (1.58%) and least (1.39%) is found among the small family sized in the rural population. In urban population, not much difference is found among the small (1.32%), medium (1.60%) and large (1.08%) family members though it is found to be higher among the medium-sized family as compared to that of large and small family members. Correlation test shows that there is a positive correlation in both rural and urban infant and child mortality which however is found to be statistically insignificant.

Table 3: Infant and child mortality by educational level of the mother

Educational level	***Live birth***	***Mortality rate per 100 live birth***		
		Infant (%)	***Child (%)***	***Total (%)***
Behiang				
Illiterate	316	13 (4.11)	6 (1.89)	19 (6.01)
Primary	347	9 (2.59)	8 (2.30)	17 (4.89)

Secondary	118	5 (4.23)	0 (0.00)	5 (4.24)
Secondary+	13	1 (7.69)	1 (7.69)	2 (15.38)
Correlation coefficient (r)		-.066	-.055	-.089
Lamka				
Illiterate	125	5 (4.00)	3 (2.40)	8 (6.40)
Primary	289	8 (2.76)	6 (2.07)	14 (4.89)
Secondary	331	10 (3.02)	3 (0.91)	13 (3.92)
Secondary+	119	0 (0.00)	2 (1.68)	2 (1.68)
Correlation coefficient (r)		-.110	-.077	-.129*

*Correlation is significant at the 0.05 level (2 tailed)

Table 3 highlights the existence of infant and child mortality based on the mother secular educational attainment at the time of data collection. In rural areas, infant mortality is found to be highest (7.69%) among the secondary+ mother followed by secondary level (4.23%), illiterate (4.11%) and primary (2.59%) at the least. In urban population, highest infant mortality is found among the illiterate mothers (4.00%), followed by secondary (3.02%), primary (2.76%) and least/nil among the secondary+ mothers. In case of child mortality, the rural experience highest child mortality rate among the secondary+ (7.69%) level of mother education followed by primary (2.30%), illiterate (1.89%) and the least/nil among the secondary level of education. Statistical shows that there is a negative correlation in both rural and urban population though it is found to be statically significant only in the overall infant and child mortality (-.129*) in urban areas at 0.05 level of significance.

Table 4: Infant and child mortality by educational level of the Father

Educational level	***Live birth***	***Mortality rate per 100 live birth***		
		Infant (%)	***Child (%)***	***Total (%)***
Behiang				
Illiterate	178	6 (3.37)	4 (2.25)	10 (5.62)
Primary	283	11 (3.88)	7 (2.47)	18 (6.36)
Secondary	307	11 (3.58)	4 (1.30)	15 (4.88)
Secondary+	26	0 (0.00)	0 (0.00)	0 (0.00)
Correlation coefficient (r)		-.036	-.066	-.073
Lamka				
Illiterate	19	0 (0.00)	0 (0.00)	0 (0.00)
Primary	153	5 (3.26)	3 (1.96)	8 (5.23)
Secondary	496	16 (3.22)	6 (1.21)	22 (4.43)
Secondary+	191	2 (1.05)	5 (2.62)	7 (3.66)
Correlation coefficient (r)		-.070	-.044	-.029

The possibility of father education as a factor that may influence infant and child mortality among the children has been introduced in table 4. The data shows that infant mortality is more or less similar in all the categories of the educational level of the father in rural areas. It is found to be highest in the primary category (3.88%), slightly lower in secondary (3.58%), illiterate (3.37%) and nil among the secondary+. In urban areas, the highest frequency of infant mortality is found among the primary category (3.26%) followed by secondary (3.22%), secondary+ (1.05%) and absent among the illiterate category. In case of child mortality rate, the highest concentration in rural population is found among the primary category (2.47%), followed by illiterate (2.25%), secondary (1.30%) and absent among the secondary+ level of education. In contrast, urban population witness highest child mortality among the secondary+ category (2.62%), followed by primary (1.96%), secondary (1.21%) and absent among the illiterate fathers. It also

shows that there is a negative correlation in both rural and urban population though it is found to be statically insignificant.

Table 5: Infant and child mortality by mother's occupation

Occupation	***Behiang***			***Lamka***		
	Frequency	***Live birth***	***Infant & child mortality (%)***	***Frequency***	***Live birth***	***Infant & child mortality (%)***
Housewife Cultivator Services Business	33 131 4 63	108 482 7 197	4 (3.70) 36 (7.46) 0 (0.00) 3 (1.52)	207 0 10 85	577 0 31 251	28 (4.85) 0 (0.00) 0 (0.00) 3 (1.19)
Chi square (χ^2)	11.95, df=3, p< 0.01			6.54, df=3, p< 0.05		

The prevalence of infant and child mortality base on mother occupation has been illustrated in table 5. In rural areas, the prevalence of infant and child mortality rate is highest among the cultivator (7.46%) followed by housewife (3.70%), business (1.52%) and is absent among the services categories. In urban areas, the prevalence of infant and child mortality rate is highest among the housewife (4.85%) followed by business (1.19%) and is absent among services just as in rural areas. It also shows that there is a statistically significant difference in the occurrence of infant and child mortality in both rural (11.95, df=3, p< 0.01) and urban population (6.54, df=3, p< 0.05). The relationship is found to be

much more significant in the rural areas as compared to that of the urban population.

Table 6: Infant and child mortality by father's occupation

Types of Occupations	***Behiang***			***Lamka***		
	Frequency	***Live birth***	***Infant & child mortality (%)***	***Frequency***	***Live birth***	***Infant & child mortality (%)***
Cultivator	152	526	35 (6.65)	0	0	0 (0.00)
Services	20	59	1 (1.69)	106	292	13 (4.45)
Business	25	91	2 (2.19)	24	59	3 (5.08)
Others*	34	118	5 (4.24)	172	508	21 (4.13)
Chi square (χ^2)	4.83, df=3, p<0.1			0.001, df=3, p> 0.1		

*Others include pastor, disguised employment, and driver

Table 6 shows infant and child mortality by the occupation of the father. In rural areas, the highest occurrence of infant and child mortality rate is found among cultivators (6.65%), followed by others (4.24%), business (2.19%) and services (1.69%) at the least. In the urban areas, business (5.08%) categories witness the highest infant and child mortality followed by services (4.45%) and other categories (4.13%). Chi-square (χ^2) test between the types of occupation and infant and child mortality shows that there is a statistically significant difference in the rural (χ^2=4.83, df=3, p<0.1) but the urban areas, which, however, does not show any statistically significant difference (χ^2=0.001, df=3, p> 0.1).

Table 7: Infant and child mortality by household income

Income group	***Live birth***	***Mortality rate per 100 live birth***		
		Infant (%)	***Child (%)***	***Total (%)***
Behiang				
LIG	372	17 (4.57)	13 (3.49	30 (8.06)
MIG	249	8 (3.21)	1 (0.40)	9 (3.61)
HIG	173	3 (1.73)	1 (0.57)	4 (2.31)
Correlation coefficient (r)		-.064	-.132*	-.136*
Lamka				
LIG	432	14 (3.24)	3 (0.69)	17 (3.93)
MIG	255	3 (1.17)	9 (3.53)	12 (4.70)
HIG	172	6 (3.48)	2 (1.16)	8 (4.65)
Correlation coefficient (r)		-.053	.068	-.007

*Correlation is significant at the 0.05 level (2 tailed), LIG (Low Income Group), MIG (Middle Income Group), HIG (High Income Group)

Household income and its influence on infant and child mortality have been illustrated in Table 7. The data shows that the infant mortality rate is found to be highest in LIG (4.57%) followed by MIG (3.21%) and lowest among HIG (1.73) in rural areas. The same is not true in urban population. The occurrence of infant mortality rate is highest among the HIG (3.48%) followed by LIG (3.24%) and least in MIG (1.17%). In case of child mortality rate, the frequency shows that it is highest among the LIG (3.49%), lower in case of HIG (0.57%) and MIG (0.40%) in rural population. In the urban population, the highest occurrence of child mortality rate is found among MIG (3.53%), followed by HIG (1.16%) and LIG (0.69%). The statistical test shows that there is a negative correlation in all the categories in which child mortality (-132*) and the overall mortality (-136*) in rural areas is found to be significant at 0.05 significant levels. On the other hand, the urban population does not

show any significant level though it shows negative and positive correlation on infant and child mortality respectively.

Table 8: Infant and child mortality by types of residences

House type	***Live birth***	***Mortality rate per 100 live birth***		
		Infant (%)	***Child (%)***	***Total (%)***
Behiang				
Kaccha	725	25(3.45)	15 (2.07)	40 (5.52)
Semi-pucca	69	3 (4.34)	0 (0.00)	3 (4.34)
Pucca	0	0 (0.00)	0 (0.00)	0 (0.00)
Correlation coefficient (r)		-.028	-.073	-.021
Lamka				
Kaccha	138	5 (3.62)	1 (0.72)	6 (4.34)
Semi-pucca	462	11 (2.38)	10 (2.16)	21(4.54)
Pucca	529	7 (1.32)	3 (0.56)	10 (1.89)
Correlation coefficient (r)		-.003	-.002	-.008

Table 8 shows infant and child mortality by types of residence. The prevalence of infant mortality rate is found to be higher among semi-pucca residence (4.34%) as compared to kaccha houses (3.45%) in rural areas. In urban areas, the occurrence of infant mortality rate is highest among the kaccha resident (3.62%) followed by semi-pucca (2.38%) and pucca house (1.32%) at the least. In the case of child mortality, those household living in kaccha experience maximum mortality rate as compared to other resident types of houses. In urban areas, semi-pucca dweller witness highest (2.16%) child mortality rate followed by kaccha (0.72%) and pucca houses (0.56%). Though it shows a negative correlation in both rural and urban areas, it is found to be statically insignificant in both cases.

Table 9: Infant and child mortality by main fuel in kitchen

Main fuel used in the kitchen	***Live birth***	***Mortality rate per 100 live birth***		
		Infant (%)	***Child (%)***	***Total (%)***
Behiang				
Firewood	717	26 (3.63)	13 (1.81)	39 (5.44)
Charcoal	77	2 (2.59)	2 (2.59)	4 (5.19)
LPG	0	0 (0.00)	0 (0.00)	0 (0.00)
Correlation coefficient (r)		-.004	-.009	-.005
Lamka				
Firewood	0	0 (0.00)	0 (0.00)	0 (0.00)
Charcoal	135	5 (3.70)	1 (0.74)	6 (0.00)
LPG	724	18 (2.48)	13 (1.79)	31 (4.28)
Correlation coefficient (r)		.000	.049	.019

The types of main fuel used in the kitchen of each household and the prevalence of infant and child mortality are shown in table 9. Those households using firewood as the main fuel experience maximum infant death rate (3.63%) followed by charcoal (2.59%) in rural areas. In the town, those households with charcoal as the main fuel experience maximum (3.70%) infant death rate followed by LPG (2.48%) users. In case of child mortality, those household using charcoal experience highest child mortality rate as compared to firewood in rural areas, whereas those households using LPG as the main fuel in the town experience higher (1.79%) mortality rate as compared to charcoal (0.74%) users. It also shows that there is a negative correlation in rural areas but it is statically insignificant. The urban population shows a positive correlation which is also not significant.

Table 10: Infant and child mortality by types of toilets

Types of toilet	***Behiang***			***Lamka***		
	Frequency	***Live birth***	***Infant and child mortality (%)***	***Frequency***	***Live birth***	***Infant and child mortality (%)***
Own pit Septic	215 16	747 47	40 (5.35) 3 (6.38)	79 276	78 0	2 (2.53) 35 (4.48)
Chi square (χ^2)	0.001, df=1, p>0.1			5.8019, df=1 p<0.01		

The relationship between types of toilets and the possible influence of infant and child mortality is shown in table 10. In rural areas, infant and child mortality rate is a little higher in septic tank (6.38%) users as compared to that of those households using their own pit (5.35%) for defection. In the town, septic tank (4.48%) user appears to experience higher infant and child mortality rate as compared to that household using their own pit (2.53%). Chi-square (χ^2) test between types of toilet and infant and child mortality shows that there is no statistically significant in rural areas (χ^2=0.0001, df=1, p>0.1), but it appears to have a significant difference in urban areas (χ^2=5.8019, df=1, p<0.01).

Table 11: Infant and child mortality by mother self- health assessment

Good Health	***Behiang***			***Lamka***		
	Frequency	***Live birth***	***Infant and child mortality (%)***	***Frequency***	***Live birth***	***Infant and child mortality (%)***
Positive	150 81	518 276	18 (3.47)	226 76	611 248	26 (4.25)

response Negative response			25 (9.05)			11 (4.43)
Chi square (χ^2)	8.13, df=1, p<0.001			0.35, df,1 p>0.1		

Table 11 shows the possible influence of infant and child mortality base on the self-health assessment of the child's mothers. In rural areas mother with negative respondent appears to have experience higher (9.05%) infant and child mortality rate as compared to that of the positive respondent (3.47%). In urban population negative (4.43%) and positive (4.25%) respondent has little difference with infant and child mortality rate. Chi-square (χ^2) test shows that it is highly significant (χ^2 =8.13, df=1, p<0.001) with respect to infant and child mortality in rural areas. However, the urban population does not show statistical significance (χ^2 = 0.35, df=1 p>0.1) with that of infant and child mortality.

Table 12: Infant and child mortality based on major self-reported morbidity of the mother

Health problems	***Behiang (N = 231)***				***Lamka (N =302)***			
	λ	***Live birth***	***Infant (%)***	***Child (%)***	***λ***	***Live birth***	***Infant (%)***	***Child (%)***

Heart Disease	68	260	10 (3.85)	4 (1.54)	50	170	5 (2.94) 5 (1.18)	3 (1.76)
Gastric issues*	12	489	18 (3.68)	13(2.65)	14	44	11(84.61)	8 (1.88)
Diabetes	63	100	0 (0.00)	2 (20.00)	43	134	0 (0.00)	0 (0.00)
Tuberculosis	32	804	4 (5.00)	2 (2.50)	42	456	2 (3.33)	2 (4.44)
Blood issues	16	218	8 (3.66)	7 (3.21)	21	602	0 (0.00)	1 (1.66)
Others**	60	153	6 (3.92)	2 (1.31)	18	123	10 (2.86)	0 (0.00)
No major diseases	355	119	5 (4.20)	0 (0.00)	131	349		5 (1.43)
	51							

*include stomach ache, indigestion, intestinal problems, λ-Frequency of number of mothers

** include liver, kidney stone, and gall bladder

The frequency distribution of infant and child mortality base on the mother major self-reported morbidity has been displayed in table 12. Maximum incidence of infant death rate in rural areas is witness by mothers who suffers from Tuberculosis (5.00%) followed by no major complaint (4.20%), others category (3.92%), heart diseases (3.85%), gastric issues (3.68%), blood issues (3.66%) and absent in diabetic mothers. On the other hand, diabetic mothers experience a quantum high infant mortality rate (84.61%) followed by blood issues (3.33%), gastric issues (1.18%) and absent in tuberculosis and others category in the town. In case of child mortality rate, the highest frequency is witness by diabetic mothers (20.00%) followed by blood issues (3.21%), gastric issues (2.65%), tuberculosis (2.50%), others category (1.31%) and is absent in no major diseases category in rural areas. In the town, the maximum number of child mortality is witnessed by tuberculosis mothers (4.44%) followed by gastric issues (1.88%), heart diseases (1.76%),

blood issues (1.66%), no major diseases (1.43%) and absent in blood issues and in other categories.

Table 13: Infant and child mortality by rates of adoption of family planning methods

Adoption of Family Planning	***Behiang***			***Lamka***		
	Frequency	***Live birth***	***Infant & Child mortality (%)***	***Frequency***	***Live birth***	***Infant & Child mortality (%)***
Adopter*	72	245	9 (3.67)	138	369	19 (5.15)
Non-adopter	159	549	34 (6.19)	164	490	18 (3.67)
Chi square (χ^2)	2.26, df =1, P> 0.1			0.49,df=1, p> 0.1		

*include contraception, abortion, pills, etc.

Table 13 demonstrate infant and child mortality by the adoption of family planning. It shows that infant and child mortality rate is found to be higher among the non-adopter (6.19%) as compared to that of the adopter (3.67%) in rural areas. In urban population, infant and child mortality rate is found to be higher (5.15%) among the adopter as compared to that of non-adopter (3.67%). However, Chi-square test shows that the adopter and non-adopter do not show any statistically significant difference on infant and child mortality in both the rural (χ^2 =2.26, df =1, P> 0.1) and the urban population (χ^2 =0.49, df=1, p> 0.1).

Table 14: Infant and child mortality by ANC visit during pregnancy

ANC visits	*Behiang*		*Lamka*	
	Frequency	***Total ICM***	***Frequency***	***Total ICM***
Visitors Yes* No	 145 66	 21 22	 211 83	 24 19
Chi square value (χ^2)	6.23, df=1, p<0.01		4.52, df=1, p<0.05	
Received iron and follicle tablets Yes No**	 127 84	 19 24	 191 103	 19 24
Chi square value (χ^2)	3.74, df=1, p<0.05		6.89, df=1, p<0.01	
Received Tetanus injection Yes No	 192 19	 19 4	 238 56	 39 4
Chi square value (χ^2)	1.64, df=1, p> 0.1		2.43, df=1, p>0.1	

*include private, hospital, PHC and clinic ICM= Infant and Child Mortality

**including can't swallow

Table 14 illustrate the significance of infant and child mortality by ANC visit during pregnancy of the last childbirth. In case of the mother, ANC visits in rural areas, the statistical test shows that the difference between visitor and non-visitor is significant (χ^2 =6.23, df=1, p<0.01) with respect to infant and child mortality rate. In rural areas, statistical analysis shows that there is a significant difference (χ^2 =4.52, df=1, p<0.05) between ANC visitor and non-visitor with respect to infant and child mortality rate in the study population. The statistical relationship between women who received

iron follicles during pregnancy and those who did not show a significant difference in both rural (χ^2 =3.74, df=1, p<0.05) and urban (χ^2 = 6.89, df=1, p<0.01) with respect to infant and child mortality. However, those mothers who received Tetanus injection and those who did not show insignificant difference in both rural (χ^2 = 1.64, df=1, p> 0.1) and urban (χ^2 = 2.43, df=1, p>0.1) population.

Table 15: Infant and child mortality by vaccination (last childbirth) up to 5 years

Vaccination	***Frequency***	***Live birth***	***Mortality rate per 100 live birth***		
			Infant (%)	***Child (%)***	***Total (%)***
Behiang					
No immunization**	16	56	3(5.35)	3 (5.35)	6 (10.71)
Polio	46	196	9 (4.59)	4 (2.04)	13 (6.63)
Polio+BCG	17	60	3 (5.00)	1 (1.66)	4 (6.66)
Polio+Tetanus	14	66	0 (0.00)	0 (0.00)	0 (0.00)
Polio+BCG+Tetanus	6	27	1 (3.70)	2 (7.41)	3 (11.11)
Polio+BCG+Tetanus+ Measles	109	387	12 (3.10)	5 (1.29)	17 (4.39)
Coefficient correlation (r)			.021	-.047	-.013

Lamka					
No immunization**(7)	7	33	0 (0.00)	2 (6.06)	2 (6.06)
Polio (41)	41	109	8 (7.34)	2 (1.83)	10 (9.17)
Polio+BCG (16)	16	36	1 (2.77)	1 (2.77)	2 (5.55)
Polio+Tetanus (4)	4	22	0 (0.00)	0 (0.00)	0 (0.00)
Polio+ Measles (2)	2	6	0 (0.00)	0 (0.00)	0 (0.00)
Polio+BCG+Tetanus (86)	86	251	11 (4.38)	4 (1.59)	15 (5.97)
Polio+BCG+Tetanus+ Measles	134	400	3 (0.75)	5 (1.25)	8 (2.00)
Coefficient correlation			-.126*	-.029	-.097

*Correlation is significant at the 0.05 level (2 tailed)

**Reasons for no immunization; unable to afford, no hospital, not yet, etc.

Table 15 display the distribution of infant and child mortality based on vaccination of the last childbirth. In rural areas, the highest prevalence of infant death rate falls under no immunization category (5.35%) and the least/nil among polio+Tetanus with no mortality record. In the town, the highest infant mortality rate is found among those infants who received only polio (7.34%) and the least/absent among infant who received Polio+Tetanus, Polio+measles and No

immunization category. In case of the child mortality rate, the highest is found among Polio+BCG+Tetanus category (7.41%) and the least is found among Polio+BCG+Tetanus+Measles category (1.29%) in rural areas. In the town, the highest number of child mortality rate is found in No immunization category (6.06%) and the least is found among Polio+BCG+Tetanus+ Measles category (1.25%). The table also shows that there is a positive correlation on infant mortality but child mortality rate and the overall show a negative correlation in the rural population which is statically insignificant. In urban areas, though it shows all negative correlation in all the categories, only infant mortality (-.126*) is found to be statistically significant at 0.05 level of significance.

Table 16: Infant and child mortality by an additional dietary pattern of the mother (base on the last childbirth)

Additional diet of the mother	***Live birth***	***Mortality rate per 100 live birth***		
		Infant (%)	***Child (%)***	***Total (%)***
Behiang				
During pregnancy	131	3 (2.29)	4 (3.05)	7 (5.34)
Yes (45)	663	25 (3.77)	11 (1.66)	36 (5.43)
No (163)				
After delivery	362	13 (3.59)	6 (1.65)	19 (5.24)
Yes (101)	432	15 (3.47)	9 (2.08)	24 (5.55)
No (107)				
Lamka				
During pregnancy	162	3 (1.85)	0 (0.00)	3 (1.85)
Yes (58)	697	20 (2.87)	14 (2.01)	34 (4.87)
No (236)				
After delivery	556	17 (3.05)	6 (1.07)	23 (4.13)
Yes (194)	303	6 (1.98)	8 (2.64)	14 (4.62)
No (99)				

Table 16 shows the prevalence of infant and child mortality by an additional dietary pattern of the mother during and after pregnancy. In rural areas, the prevalence of infant mortality rate is found to be highest (3.77%) among those mothers who did not receive any additional meant for the fetus as compared to those mothers who enjoyed additional dietary food habits (2.29%). A similar tendency is found in the town where the mother who received additional diet experience lesser infant mortality rate (1.85%) than those mothers who did not practice (2.87%) such additional dietary pattern during pregnancy.

On the contrary, the data further shows that additional diet after delivery experience higher infant death rate (3.59%) as compared to those who did not (3.47%) in rural areas. A similar tendency is found in the town where mothers who received additional diet after delivery experience higher infant death rate (3.05%) as compared to those mothers who did not (1.98%) practice such habits. In case of the child, the prevalence of child mortality rate is found to be higher (3.05%) among those mothers who practice additional dietary habits as compared to those mothers who did no such practices (1.66%) in rural areas. In the town, the prevalence of child mortality rate is absent among those who practice additional dietary habit but about 2.01% child mortality rate is found among mothers who did not practice additional food ruing pregnancy. The table further illustrates that the prevalence of child mortality rate is higher (2.08%) among those mother who did not practice additional dietary habits after delivery as compared to those mothers who practice (1.65%) good dietary habit even after delivery in rural areas. Similar incidence has been found in the town, in which, those mothers who enjoy additional dietary habits after delivery experience lower child mortality rate (1.07%) as compared to that mother who did not (2.64%) practices such habits.

Figure 17: Frequency distribution of infant and child mortality by place of delivery and cutting cord

Constituents	***Behiang (N=43)***		***Lamka (N=37)***		χ^2 ***value***
	Infant (N=28)	***Child (N=15)***	***Infant (N=23)***	***Child (N=14)***	
Place of delivery					
Home* (%)	24 (85.71)	13 (86.66)	10 (43.47)	6 (42.85)	16.30 P<0.001
Hospital/PHC/Clinic (%)	4 (14.28)	2 (13.33)	13 (56.52)	8 (57.15)	
Instrument used for cutting the cord					
Bamboo/knife/scissor (%)	4 (14.28)	2 (13.33)	1 (7.69)	0 (0.00)	18.68 P<0.01
Blade (%)	19 (67.85)	11 (73.33)	9 (39.13)	5 (35.71)	
Hospital/PHC/Clinic (%)	4 (14.28)	2 (13.33)	13 (56.52)	9 (64.28)	

*including midwives

Table 17 shows the frequency distribution of infant and child mortality by place of delivery and cutting cord at the time of giving birth to the child. In rural areas, the frequency of infant death is highest at home (85.71%) than in hospital/PHC/Clinic (14.28%). In the town, the infant mortality rate is lower among the home delivery (43.47%) as compared to Hospital/PHC/Clinic (56.52%). The table also illustrates the frequency distribution of infant mortality rate by

different methods of cutting the cord at the time of delivery. It shows that the infant death rate is maximum among blade (67.85%), followed by bamboo/knife/scissor and Hospital/PHC/Clinic at 14.28% each in rural areas. In contrast, the table also shows that Infant mortality rate in the town is found to be highest in Hospital/PHC/Clinic (5.52%) followed by the blade (39.13%) and least in bamboo/knife/scissor (7.69%) category of cutting the cord. The Chi-Square (χ^2) value i.e. 16.30 df=1, $p<0.001$ shows a significant difference between the place of delivery in respect of overall infant and child mortality in the study population. The difference between the types of instrument used for cutting the cord during childbirth is found to be statically significant ($\chi^2=18.68$, df=2, $p<0.01$).

In the case of the child, the mortality rate is highest among home delivery (86.66%) as compared to Hospital/PHC/clinic (13.33%) in rural areas. In the town, the frequency of the child mortality rate is found to be highest in Hospital/PHC/Clinic (57.15%) as compared to home delivery (42.85%). On the other hand, the frequency distribution of child mortality rate is highest among blade (73.33%), followed by Hospital/PHC/Clinic and Bamboo/knife/scissor at 13.33% each in rural areas base on the type of instrument used for cutting the cord. In the town, the frequency distribution of child mortality rate is maximum among Hospital/PHC/Clinic (64.28%) followed by the blade (35.71%) and absent among Bamboo/knife/scissors.

Table 18: Causes of infant and child mortality

Causes	***Mortality rate per 100 live birth***					
	Behiang (794)			***Lamka (859)***		
	Infant (%)	***Child (%)***	***Total (%)***	***Infant (%)***	***Child (%)***	***Total (%)***
Malaria	3 (0.377)	2 (0.251)	5 (0.629)	1 (0.116)	0 (0.000)	1 (0.116)
Fever	5 (0.629)	1 (0.125)	7 (0.881)	3 (0.349)	1 (0.116)	10 (1.164)
Diarrhoea	2 (0.251)	2 (0.251)	3 (0.377)	0 (0.000)	2 (0.232)	5 (0.582)
Tuberculosis	2 (0.251)	1 (0.125)	3 (0.377)	2 (0.232)	3 (0.349)	4 (0.465)
Kau	4 (0.503)	0 (0.000)	6 (0.755)	1 (0.116)	0 (0.000)	0 (0.000)
Liver	0 (0.000)	0 (0.000)	2 (0.251)	1 (0.116)	0 (0.000)	2 (0.232)
Typhoid	0 (0.000)	0 (0.000)	1 (0.125)	4 (0.465)	1 (0.116)	1 (0.116)
Swelling/Tumour	1 (0.125)		3 (0.377)	0 (0.000)	0 (0.000)	0 (0.000)
SIDS	1 (0.125)		1 (0.125)	0 (0.000)	1 (0.116)	1 (0.116)
Heart	2 (0.251)		2 (0.251)	1 (0.116)	1 (0.116)	2 (0.232)
Kidney	0 (0.000)		0 (0.000)	0 (0.000)	0 (0.000)	0 (0.000)
Others*	4 (0.503)		4 (0.503)	3 (0.349)	2 (0.232)	5 (0.582)
Unknown**	5 (0.629)		5 (0.629)	2 (0.232)	4 (0.465)	6 (0.698)

*Others includes burning, accident

**Unknown cause is related to *Kau*/evil possession/multiple complications

Table 18 shows a summary of the causes of infant and child mortality. In rural areas, it shows that fever and unknown illness at 0.629% each appears to cause maximum life to infant mortality rate and the least is found among swelling/tumor and Sudden Infant Death Syndrome (SIDS) at 0.125% each. In the town, maximum infant death is caused by fever-related illness at 1.047% and the least is caused by Kidney, SIDS, Tuberculosis and malaria at 0.116% each. In case of child mortality, the maximum frequency of mortality is caused by malaria, fever, *kau*, liver and swelling/tumor at 0.251% each and the least is caused by typhoid, tuberculosis, diarrhoea at 0.125% each in rural areas. In the town, maximum child mortality is caused by tuberculosis and others category at 0.349% each and the least is caused by fever, typhoid, and heart disease at 0.116% each.

Summary and conclusion

The types of family in many studies show the influence of infant and child mortality at length especially among the extended type of family which is common among the Hindu family. However, the present study shows that there is no significant correlation with the types of family. This could be attributed to the nature of nuclear and joint family where few members share together the same resources available to them in abundance. Interestingly, Zou people do not practice extended family as such.

The present study also shows that there is a positive correlation with the size of the family. With the increase in a family member, the need for resources increases with respect to the ever increasing demand for consumption. The possibility of limited means and proper wellbeing of the family at a time is subsidiary for a large family. This could indirectly influence the health status of infant and child at large leading to the unfortunate demise of the family member particularly the younger members which are more venerable of being the least taken care in several instances.

The educational level of the mother is one of the main interesting affluences to study the relationship of mother secular education and its impact on the wellbeing of her children. The study shows that there is a negative correlation with respect to the educational level of the mother in both the rural and in the town. The influence of educational status of the mother is more noticeable in the case of the overall infant and child mortality in the town. If the mother has some fundamental educational background, she is more conscious of her children health status which indirectly benefits the offspring. The possible influence of the father educational background on infant and child mortality has been taken into consideration. Though the educational level of the father shows a negative correlation, the effect of such educational background of the father does not show much influence on infant and child health issues which parenthetically may influence mortality in the study population. The father, being the traditional Head of the Family among the Zou people is often engaged in earning and supporting the family as a whole. As a result, his role in the efforts to rise up children base on his educational background may not have significant impacts on the relationship with the prevailing infant and child mortality rate.

The occupation of the lactating mother is also another cause of concerned for the wellbeing of the children. Bankole (1989), survey on 2111 mothers in Ile-Ife, Nigeria shows that children of working-class mothers are likely to experience higher rates of infant death than those of non-working mothers, and these rates are higher in mothers working in the informal than in the formal sector. Similar cases have been found among the Zou mothers who work in an organized sector. Government initiative to empower child welfare like maternity leave has a significant impact on the health of the young one particularly during the first 6 months of lactation. On the other hand, a substitution for maternity leave of an unemployed mother could serve as housewife right from the date of conception. This, in turn, favors the success rate of giving birth to a healthy baby as compared to those mothers who engage in agricultural activities

as shown in the study population. On the other hand, father occupation also shows a negative correlation with respect to the rate of infant and child mortality in rural areas. Though statistical test shows that there is not much relationship with the father educational qualification, it is evident from the trend that father education can also play an important role in minimizing the rate of infant and child mortality in both rural and urban population.

The influence of infant and child mortality in many instances enormously depends on the household income of the family. In the present study population, it shows that there is a significant correlation between household income and the overall infant and child mortality, particularly in rural areas. The importance of household income plays a vital for the wellbeing of the family as a whole. In the study population, the prevalence of mortality rate is dependent on income. However, the household income from the urban population shows lesser degrees of correlation on infant and child mortality as compared to that of the rural population. In a study conducted by Dallolio et al (2012) in Italy, the total unemployment rate and the mean household income shows a strong correlation with infant mortality. It further demonstrates that high income is universally available variations in Infant Mortality were strongly associated with relative and absolute income and unemployment rate.

The importance of well planned residential areas provides comfortable living and the ease of creating a healthy atmosphere in the house. The present study also includes the types of houses aiming to illustrate the possible influence on infant and child mortality. Though there is no significant correlation of infant and child mortality with the types of houses from both rural and urban population, it shows that there is a negative correlation with the condition of the better house which further illustrates that there are better chances of survival in those better houses with better facilities. This could be the indirect result of better household income as compared to those families with lesser household income.

The types of fuel used in the kitchen signify the quality of air in the household to substantial degrees. Though the idea of

considering types of fuel used in the kitchen is from an environmental perspective, much of the quality of the kitchen and its surrounding environment plays the quality of air in the adjoining areas. In the study population, it shows that firewood which produces more smokes appears to have maximum impacts on infant and child mortality, especially in rural areas. Recent studies in Pakistan also shows that using kerosene as the main fuel which is categorized as household air pollution has shown significant associations between under-five mortality, apart from causing major respiratory illness among young children (Naz et al, 2017). In the present study population, the use of firewood in urban population as the main fuel is not available.

Accepting the importance of *Swatch Bharat* in India to spread awareness about cleanliness hygiene across the country, an essential parameter such as types of toilet has been included in the study population to examine the awareness about the accessibility and its vital role to the health status of the younger sibling. In rural areas, the study shows that using own pit has a lesser impact on infant and child mortality rate as compared to the septic tank for defection. Though it does not have significant correlation statistically, the same is true in the case of the urban population. Septic tank often produces smells often leads to gastric delinquent in the long run for the surrounding resident. The influence of such noxious airborne is harmful especially for the health of the feebler sibling. A study in South Sudan also shows that an improved toilet facility is a major health care performer and also decreases infant mortality. The study further illustrated that the types of toilet facility were significantly associated with infant mortality (Ajak et al, 2018).

The importance of physical and mental well-being of the mother is vital for the children even before conception. The present study shows that there is a strong correlation on infant and child mortality with respect to the self-health assessment of the mother, especially in rural areas. As the dependency on muscular power for the livelihood in rural areas is ascertain, the health of the mother also plays an important role in the types of the task she can perform with

the potential demand. For prolonged sickly mothers, the ability to give birth to a healthy baby is far from reality besides the increasing demand within the household premises and other responsibilities. The condition of the health of the mother is vital for the success rate of healthy infant and child as a whole. However, the study population shows that the rate of infant and child mortality in the town appears to have a lesser impact as compared to that of the rural areas.

The influence of family planning is another important factor to reconsider courteously for the success of its proper implementation. In rural areas adoption of family planning appears to have a lesser influence on child mortality as compared to those who did not go for adoption. Often, there is a general believed that non-adoption of family planning is the cause of a large family, which may indirectly be the cause of higher mortality rate in rural areas. In the town, such relation could not be established to give a definite conclusion.

The influence of child mortality by ANC visit during pregnancy is also considered in the present study population. ANC visit during pregnancy shows a lesser incident of infant and child mortality in both rural and urban population. Ironically, the finding shows that receiving iron follicles shows higher infant and child mortality rate in both cases. Receiving Tetanus injection also shows a higher degree of infant and child mortality as compared to those who did not go for injection. However, the probability of coincidence cannot be totally ignored as it does not show statistical significance in both the rural and the urban areas except in the case of child mortality in the town upon receiving iron follicle tablets.

From the study of socio-economic influence practices and the reasonable correlation of infant and child mortality among the Zou tribe of Manipur, the findings illustrate the demographic dividend of the under privilege marginalized section of the society. The outcome further demonstrates the prevalence of mortality rate from the younger generation can be reduced by proper awareness and management of the mother's neonatal care from the initial stages of conception. The availability and accessibility of appropriate hospital

facilities with respect to household income level will definitely reduce the incidence of infant and child mortality in the study population.

References

Bankole, A. (1989). Maternal Employment and Infant Mortality: An Examination of the Role of Breastfeeding as anIintermediate Factor. *Biology and Society: The Journal of Eugenics Society,* 6 (1). pp.19-26.

Ajak, A.A.D., Ikamari, L.,& Kimani, M. (2018). Levels and Differentials of Infant and Child Mortality Rates in Malakal in Upper Nile State, South Sudan. *International Journal of Advances in Scientific Research and Engineering (ijasre),* 4 (11). pp. 248-260.

Carroll, P. (2014). *Worldwide Nearly 6 Million Babies are Born and Die Each Year without Birth or Death Certificates*. Retrieved from <http://www.savethechildren.org/site/apps/nlnet/content2.aspx?c=8rKLIXMGIpI4E&b=943369&ct=13949459>

Dallolio, L., Gregori, D,V., Lenzi,J,. Franchino,G,. Calugi,S,. Domenighetti, G & Fantini M.P, (2012). Socio-economic Factors Associated with Infant Mortality in Italy: An Ecological Study. *International Journal for Equity in Health,* 11:45.

Jha, D.N. (2015). July 9. One in every 45 kids born here dies before first b'day. *The Times of India.* <Retrived from http://timesofindia.indiatimes.com/city/delhi/One-in-every-45-kids-born-here-dies-before-first-bday/articleshow/47995020.cms>

Kabir, M., Chowdhury, R. I. & Amin, R. (1995). Infant and Child Mortality Levels and Trends in Bangladesh. *Journal of Biosocial Science,* 27(02). pp. 179-192.

Naz, S., Page, A., Agho, K.E. (2017). Household Air Pollution from Use of Cooking Fuel and Under-Five Mortality: The Role of Breastfeeding Status and Kitchen Location in Pakistan. *PLoS ONE,* 12(3): e0173256. Retrieved from < https://doi.org/10.1371/journal.pone.0173256>

Pandey, A. (2010). *Introducing the Zolai Script*, 1-9.

Raza, M. & Nangia, S. (1984). *Atlas of the Child in India*. New Delhi: Concept Publishing Company.

Zomi, G. T. (2014). Marriage Practices among the Zou Tribe in Manipur - Changes and Continuity. *International Journal of Humanities and Social Science Invention,* 3(10). pp. 31-37.

Zou, D. V. (2009). The Pasts of a Fringe Community Ethno-history and Fluid Identity of the Zou in Manipur. *Indian Historical Review*, 36(2). pp. 209-235.

*** Gin Khan Khual** is Ph.D., Research Scholar of the Department of Anthropology, North Eastern Hill University (NEHU), Shillong-793022, Meghalaya.

**** D.K. Limbu** is Professor & Head of Department of Anthropology Department, North Eastern Hill University (NEHU), Shillong-793022, Meghalaya.