Child Mortality (Under 5) in Haryana: An Analysis of Spatial Pattern and Correlation

Preeti

Department of Geography, Kurukshetra University, Kurukshetra
E-mail: preeti.jangra07@gmail.com

Abstract—*Child mortality (U5) reflects the health status of children and their survival in any region. Broadly, child mortality is an indicator of quality of health services and socio-economic development of any particular area. In this context, the objectives of present study are to analyze the spatial pattern of overall child mortality and to study pattern of differential in under-five deaths in both sexes. The present study also examines the correlation of child mortality with various socio-economic, demographic and environmental variables in one of the economically developed state i.e. Haryana. The study is entirely based on secondary sources of data, which has been obtained from various publications. For the analysis of data cartography techniques and Carl Pearson correlation method has been adopted. The findings of the study indicate that northern region of the state are in good condition in child mortality, whereas most of southern and northern-eastern district are having high rate of child mortality. At the state level, results demonstrate that most of districts with high socio-economic development are having good situation in terms of child mortality. Further study reveals that female literacy rate and mean age at marriage of female are highly significantly correlated with the phenomenon of child mortality in the state. On the other hand there is not any correlation of child mortality with environmental and other social variables.*

Keywords: *Child mortality, Under-five deaths, spatial pattern, correlation*

1. INTRODUCTION

Child mortality is a very important aspect of socio-economic development of any country, it also reflect the condition of medical and public health facilities in any particular area. Child mortality defined as a probability of children dying before attaining five years of age as per 1000 live births. It is also called as under-five mortality. It is a key indicator of child well-being in terms of health status. There are various factors at individual level and community level, which affect the level of child mortality in any particular area. Broadly, child mortality in any areas is an outcome of demographic, socio-economic, environmental and medical care factors. In these factors demographic factors includes birth interval, birth order, birth size, child sex,and mothers education, exposer to mass media, women employment, housing conditions are included in socio-economic factors. Environmental factors are drinking water, sanitation and hygiene conditions and the medical factors include antenatal care, immunization, place of delivery and breastfeeding practices etc. Many aspect of these factors is also depends on cultural practices of individuals and community.

Around the world and country many researchers have explained various reasons and preventive tools of child mortality. In the India rural residence, mother's low educational status, mother's working status, the low standard of living are associated with high infant and child mortality. Birth interval and sex of the child also determine the mortality, short birth interval and male child mortality is at higher risk [8]. Twin births too significantly enhance the mortality risk of both male and female children, while risk of having a subsequent sibling is higher for boys if the first child is female[11]. Child malnutrition, rural infrastructure, access of electricity, health practice, access of water and toilets and immunization are also strongly influence the child and infant mortality in India [12].

Community is alsoresponsible for such kinds of phenomenon because it influence people by shaping the ideas, resources and behaviour. The community education and awareness influence health care issues like child nutrition, mother's care for a sick child etc practices affect child mortality [9]. At the community level discrimination on the basis of caste is also a major issue, which is responsible for the child mortality. Children belonging to low castes have higher risk of death then children belonging to upper caste and also the women belonging to low castes also have lower rates of antenatal and delivery care utilization then women belonging to upper castes [2].

At the global and India level child mortality is falling in last two decades. At the global level this has decreased from 12.7 million in 1990 to 6.3 million in 2013 but despite this decrease still it is very high. In the present context under-five mortality is high in Sub-Saharan Africa and southern Asia, while in the rest of the world situation of child death has improved. Five countries namely China, demographic republic of the Congo, India, Nigeria and Pakistan accounts about half of under-five deaths in world. In these countries India and Nigeria together

accounts for more than a third of all under-five deaths, this is about 21 and 13 percent [14].

At the country level, there is huge disparity in terms of situation of child mortality. Some districts have recorded very high rate of child mortality, whereas some districts are in good condition. According to NFHS 3 (2005-06), Utter Pradesh has highest rate (96) and Kerala has lowest rate (16). Aside from Utter Pradesh high level of child mortality found in Chhattisgarh and Madhya Pradesh in the central part, Assam and Arunachal Pradesh in the northeastern part, Jharkhand, Orissa and Bihar in the eastern part and Rajasthan in the northern part. Child Mortality is grounded in the interplay among demographic, socio-economic, environmental and medical care factors. Hence it is interesting to study and assimilates all the factor in the study of child mortality in one of economically developed state of India i.e. Haryana. It is also interesting to study that despite an economically developed state of the country, the condition of the children is vulnerable in some parts of the state. In the NFHS-3 under-five mortality rate in the state has decreased to 52.3 from 98.7 in NFHS-1, but as compare to its neighboring states Himachal Pradesh and Punjab, it is still high.
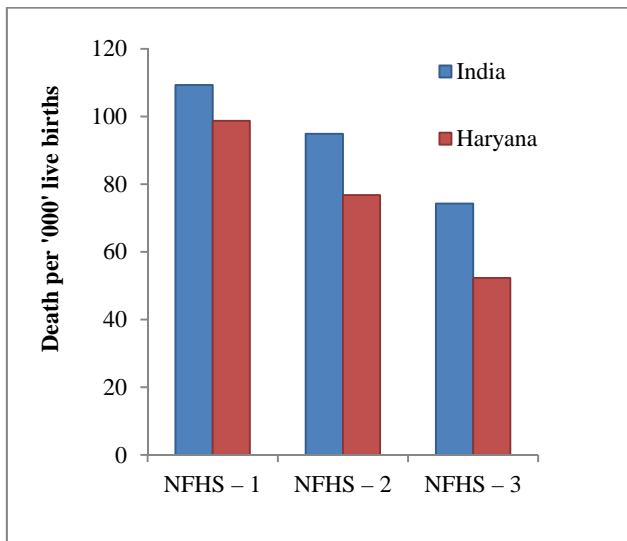
Fig. 1: Child Mortality Rate in India and Haryana

2. OBJECTIVES OF THE STUDY

1) To study the spatial pattern of under-five mortality in Haryana in 2012.
2) To study the differential in under-five deaths in both sexes in Haryana in 2012.
3) To study the correlates of under-five mortality in Haryana.

3. RESEARCH METHODOLOGY

The present study is entirely based on secondary data sources. Data for the analysis has been collected from various publications, reports and surveys. The district wise and sex wise data of under-five mortality has been obtained from estimated indicators of 597 districts, published in child mortality lancetGH 2013. The National Family Health Survey data of 1st, 2nd and 3rd round also have been obtained to show the trend of child mortality at the country and state level.

The study also attempt to examine the correlates of child mortality and for this, nine explanatory variables have been identified. These variables are 1.female literacy rate 2.Mean age at marriage for girls 3.Percentage of households with improved source of drinking water 4. Percentage of households with improved sanitation access 5.Percentage of urban population 6.Percentage of Scheduledcaste population 7.Women work participation rate 8. Percentage of population having BPL cards 9.Percentage of women having birth order 2 and above. For the first and fifth variable data has been collected from census of India 2011. For the second, third, fourth, eighth and ninth variables data has been obtained from District Level Household Survey round 4th (2012-13). Data for sixth and seventh variables has been obtained from statistical abstract of Haryana (2012-13) and primary census abstract, directorate of census operation, Haryana.

Data has been analyzed by using statistical and cartographic technologies. By using cartography techniques, choropleth map showing child mortality rate in different districts and map showing comparison of under-five deaths in both sexes has been prepared with the help of Arc-GIS 9.3. For calculating the correlation between child mortality and various socio-economic, demographic and environmental variables, Carl Pearson correlation has been calculated with the help of SPSS (17 version).

4. SPATIAL PATTERN OF CHILD MORTALITY IN HARYANA

The spatial pattern of any phenomenon is important to study to look at the disparities within region. It gives an overview about the social, economic and cultural characteristic of that region. Figure-1 is representing spatial pattern of child mortality in Haryana for the year 2012 on the basis of estimated indicator of 597 districts published in lancet. The figure-2 is giving a clear picture about child mortality conditions in every part of the state. The spatial pattern is revealing the northern part of state and districts near NH-1 is showing low rate of child mortality, whereas, southern-eastern part have moderate conditions. High child mortality has been recorded in some of the northern-western and southern districts. Low category is lying between 30 to 40 rates of child mortality. In this category seven districts namely Ambala, Panchkula, Kurukshetra, Karnal, Sonipat, Rohtak and Rewari is falling. It may be noted these districts are highly industrial developed districts and socio-economic conditions of these districts are also good.
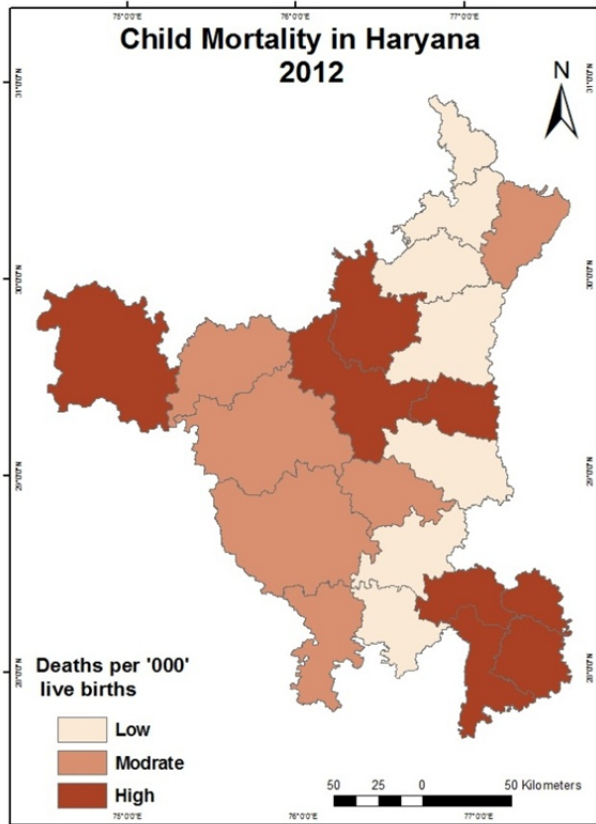
Fig. 2: Child Mortality in Haryana: 2012

The moderate category, which lying between 40 to 50 mortality rate have constituted six districts namely Fetehabad, Hissar, Bhiwani, Jhajjar, Mahendergarh and Yamunanagar. From the perspective of socio-economic development also these districts are moderately developed.High category have mortality rate above 50 and comprises 8 districts from different part of the state. Four districts namely Mewat, Palwal, Gurgaon and Faridabad are from southern region, Sirsa from eastern region, Jind and Kaithal district are from northern-western region and Panipat district from northern-eastern region. In these districts Mewat has recorded highest child mortality rate in the state in 2012 i.e. 79.7. Except Gurgaon, Panipat and Faridabad all other three district lying in this category are socially backward district in terms of women literacy, sex ratio etc.In Faridabad and Gurgaon districts percentage of slum population is very high i.e. 12.94 percent in Faridabad and 10.20 percent in Gurgaon. In case of slum population, Faridabad had first position and Gurgaon district stands at third position, so it is a major cause of high child mortality in these two districts. It may also be noted that aside from socio-economic development, cultural practices also influenced the phenomenon of child mortality in any area, which further affect the utilization of health services providing by government or other organization. Hence, cultural factors also have major contribution in the reduction of child

mortality. These types of many other factors are further represented in figure-4.

5. SPATIAL PATTERN OF DIFFERENTIAL IN CHILD MORTALITY IN BOTH SEXES

Figure-3 is representing the spatial pattern of under-five deaths among males and females in Haryana in 2012. It shows that in the state except eight districts among all other districts under five deaths of male is higher as compare to under-five deaths of females. Somehow, this situation is showing the improved condition of sex differential child mortality in case of female. In some districts namely Ambala, Hissar, Rohtak difference between male and female under-five deaths is very high as compare to other districts. In the southern, eastern and central part of state, some districts have high under five deaths in both male and female. In the state, Mewat districts have recorded highest number of under-five deaths in both sexes i.e. 82 in males and 100 in females.

The two districts of the state namely Hissar and Sirsa recorded minimum under-five deaths in females i.e. 19 and 18. In case of male, Bhiwani and Jhajjar (27 and 29) recorded minimum under- five deaths. Under-five deaths in both sexes are highest in Jind, Sirsa, Gurgaon, Mewat and Faridabad. There are many factors, which are responsible for the survival of children. Some of these factors are presented in figure-4.
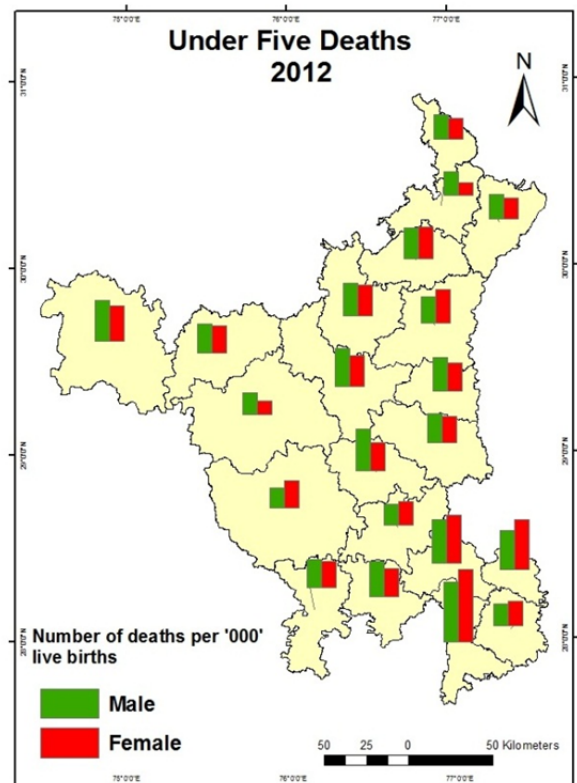

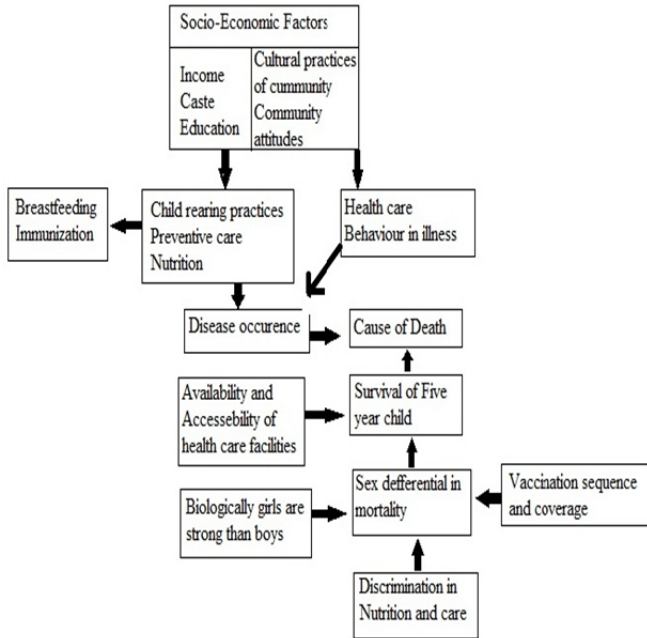**Fig. 3: Under-Five Deaths in Males and Females: 2012**

Fig. 4: Factors Affecting Child Mortality (U5)

6. RESULTS OF CORRELATION

Table-1 is giving an overview of correlation between child mortality and socio-economic, demographic and environmental variables. Socio-economic factors used in this correlation are female literacy, age at marriage, urbanization, SC population, economic variables are women work participation and percentage of population having BPL cards. Further, birth order 2 and above is used as demographic variable and availability of sanitation and drinking water have used as environmental variables. The results of correlation are showing that social variables such as female literacy and age at marriage are highly significantly correlated with the phenomenon of child mortality. Education is very important aspect for women to raise their skills and self-confidence, which further contribute to increasing women autonomy and child survival is influenced with women autonomy [3]. Decline in child mortality risk is associated with increase in the level of maternal education. Maternal education also influence fertility behaviour and child care practices, which reduces risk of child mortality [13]. Age at marriage is also influenced child mortality. Less age of marriage promote adolescent fertility and thus early timing of first child birth may lead the child mortality.

Table 1: Correlation Between Child Mortality and Other Variables

	Child mortality rate
Child mortality rate	1
female literacy rate	-.660**
Mean age at marriage for girls	-.588**

Percentage of households with improved source of drinking water	.130
Percentage of households with improved sanitation access	.059
Percentage of urban population	-.033
Percentage of Scheduled caste population	.143
Women work participation rate	-.184
Percentage of population having BPL cards	-.324
Percentage of women having birth order 2 and above)	.387

**.Correlation is significant at the 0.01 level (2 tailed)
*.Correlation is significant at the 0.05 level (2 tailed)

Adolescent women below the age 20 have higher risk of child mortality as compare to mother more than 20 years [10].

On the other hand, other social variables i.e. urbanization, SC population have not any correlation with child mortality. Further, environmental variables, availability of drinking water and sanitation facilities also do not have any correlation with child mortality. Turning to the economic variables i.e. women work participation and percentage of population having BPL card revealing that women work participation has not any correlation with child mortality, whereas variable related to BPL families is moderately correlated with child mortality. Low income promotes child under nutrition and low standard of living, which are associated with high child mortality. According to UNICF record, the poorest children in the world have two times more possibilities to die before their fifth birthday as compare to the children of wealthiest families. In India also 7000,000 children die of curable diseases every year due to poverty [15].

From the table-1 it may be noted that demographic variable birth order(2 and above) is also moderately associated with the mortality of child before age five. Birth order 3-4 and birth order 4 and above have higher risk to under five mortality of live than the children birth order 1 [4].

7. CONCLUSION

The present study concludes that child mortality is decreasing in Haryana but still it is high as compare to other states of the country. It is also varying widely from district to district and region to region. The spatial pattern of child mortality in the state is revealing that northern region and district near NH1 have low child mortality and the entire southern-western region has moderate condition.Whereas, most of the district of southern and northern-western region have vulnerable condition in terms of child mortality. Further, the findings related to under five deaths in both sexes indicates that except eight districts in most of the districts boys mortality is more than girls mortality in the state. One district of the state has worst condition in case of overall child mortality and mortality in both sexes i.e. Mewat district from southern Haryana. The findings of spatial pattern confined that except some districts overall child deaths and child death in both sexes are higher in

those districts, which are socially and economically backward and also have low female literacy rate.

The results of correlation analysis of child mortality with various variables demonstrate that female literacy and mean age at marriage of females are highly significantly correlated. The other variables such as percentage of population having BPL cards and percentage of women having birth order 2 and above are moderately associated with the phenomenon of child mortality. The findings of the study suggest that increasing women's education is one of the most effective ways of reducing child mortality. Education helps women to overcome the barriers set by low autonomy, low social status and low economic status [1, 3, 13]. For the prevention of child mortality age at marriage also should be increased and higher birth order should be decreased [4]. Further, it may also be noted that level of child mortality in any region is not entirely depends upon socio-economic development, which is an indicator of availability of facilities and resources. But somehow it also depends upon other cultural factors those are responsible for the utilization of these resources.

REFERENCES

[1] Amonker, R. G., & Brinker, G. D. (1997). Determinents of Infant and Child Mortality in India. *International Review of Modern Sociology, 27*(2).

[2] Dommaraju, P., Agadjanian , V., & Yabiku, S. (2008). The Pervasive and Persistent Influence of Caste on Child Mortality in India. *Population Research and Policy Review, 27*(4), 477-495.

[3] Gupta, M. D. (1990). Death Clustering, Mothers' Education and the Determinants of Child Mortality in Rural Punjab, India. *Population Studies, 44*(3), 489-505.

[4] Hossain , M., & Islam, M. (2008). Effects Of Demographic And Household Variables On Infant And Child Under-five Mortality: An Application Of Logistic Model. *The Internet Journal of Health, 8*(2), 1-6.

[5] IIPS. (1994). *National Family Heath Survey-1 (1992-93).* International Institute of Population Studies.

[6] IIPS. (2000). *National Family Health Survey- 2 (1998-99).* International Institute of Population Studies, Mumbai.

[7] IIPS. (2007). *National Family Health Survey-3 (2005-06).* International Institute of Population Studies, Mumbai.

[8] Khongji, P. (2013). Levels and Trends of Infant and Child Mortality in Meghalaya:Result from Life Table and Hazard Analysis. *Journal of North East India Studies, 3*(2), 1-14.

[9] Kravdal, Ø. (2004). Child Mortality in India: The Community-Level Effect of Education. *Population Studies, 58*(2), 177-192.

[10] Oyefara, J. L. (2013). Maternal Age at First Birth and Childhood Mortality in Yoruba Society: The Case of Osun State, Nigeria. *Research on Humanities and Social Sciences, 3*(1), 246-256.

[11] Pal, S., & Makepeace , G. (2008). Understanding the Effects of Siblings on Child Mortality: Evidence from India. *Journal of Population Economics, 21*(4), 877-902.

[12] Sharma, S. (2008). Childhood Mortality and Health in India. *Population, Health and Human Resources in India's Development*, (pp. 1-32). Institute of Economic, Delhi.

[13] Tulasidhar, V. B. (1993). Maternal education, female labour force participation and child mortality: evidence from the Indian Census. *Health Transition Review, 3*(2), 177-192.

[14] UNCF. (2014). *Levels & Trends in Child Mortality.* United Nations Children's Fund.

[15] World Federation Of Tearchers Union. (2015, July 2). *World Federation Of Tearchers Union.* Retrieved January 2, 2016, from http://wftufise.org: http://wftufise.org/child-mortality-remains-on-the-increase-because-of-poverty/