

Exploring the Spatial Pattern of Maternal Complications in the Eastern States of India using GIS

DIPIKA SUBBA

Assistant Professor

Department of Geography, Cooch Behar Panchanan Barma University,
Cooch Behar (W.B.) India

ABSTRACT

The paper aims to analyse the level of maternal complications in the Eastern States of India. Further, it also aims to find out the district wise variation in the level of maternal complications and the factors associated with it. DLHS III data has been used to analyse the variation in maternal complication. To show the spatial variation of maternal complications, choropleth mapping technique with the help of GIS is used. The analysis indicates that the level of maternal complications is very high in the Eastern states of India. All the eastern states have a maternal complication above national average *i.e.* 80.2 per cent. However, the levels are comparatively better in the states of Odisha. Huge district wise variation in the level of complications is also observed. The findings also indicate that the variations in the maternal complications across district may be due to the variation in health-seeking behaviour, educational level, living standard as well as under-reporting. A geographical constraint which determines the accessibility and affordability of the health care services has also emerged as an explanatory factor to some extent.

Key Words : Maternal complications, Eastern states, GIS

INTRODUCTION

Women in developing countries experience well documented increased health risk related to childbearing (Menken *et al.*, 2003). The complications related to pregnancy and childbirth are among the leading cause of mortality for women of reproductive age group. It is the outcome of the obstetric complications of the pregnant state arising from interventions, omissions, incorrect treatment or a chain of events resulting from any of these (Geubbels, 2006; Patwardhan *et al.*, 2016). In most of the developing countries, pregnancy and childbirth are accepted as normal events of life and it is not surprising that problems associated with pregnancy are also accepted without much ado (Mayank *et al.*, 2001). Nausea during

How to cite this Article: Subba, Dipika (2017). Exploring the Spatial Pattern of Maternal Complications in the Eastern States of India using GIS . *Internat. J. Appl. Soc. Sci.*, 4 (11 & 12) : 594-600.

pregnancy is also considered as a sign of good health in some society and is not classified as a morbid condition (Bhatia and Cleland, 1996). However, the World Health Organization (1992) has defined reproductive morbidity (RM) as “any morbidity or dysfunction of the reproductive tract or any morbidity which is a consequence of reproductive behaviours including pregnancy, contraceptive use, abortion, childbirth or sexual behaviour”.

In India, around 80 per cent of currently married women suffered from any maternal complication either at the time of pregnancy, delivery or post-delivery period (DLHS III, 2007-2008). Around 57% of the women experienced at least one pregnancy complication while the percentage of delivery and post-delivery complications are 61 % and 37 % respectively. Excessive fatigue and swelling in leg, body or face were the most reported pregnancy-related complications whereas, in the case of post-delivery complications, massive vaginal bleeding and very high fever were the most reported problems (Jain, 2012). The socioeconomic and demographic factors have a significant association with obstetric morbidity and women of lower socioeconomic status, birth interval less than 36 months, having a breach or caesarean delivery or a delivery assisted by relatives/neighbours have higher chances of complications (Patra *et al.*, 2008; Sontakke *et al.*, 2009).

However, there have been some government policy interventions in India aimed at specifically improving access and quality of maternal services. India’s National Family Welfare Programme which is implemented to address the needs of families, notably women and children, and to reduce population growth rates did not live up to its title of “family welfare” (Jejeebhoy, 1997). Further, after the event of ICPD held in Cairo in 1994, the population programme saw a paradigm shift. The importance of reproductive health gained importance and became an area of concern especially in developing countries. But unsafe motherhood is still a reality in much of India (Jejeebhoy and Ramarao, 1993). There is a wide variation of complications across states in India and the factors responsible for this variability vary from one another. The eastern states of India (Bihar, Jharkhand, West Bengal and Odisha) selected for further study has poor maternal health and account highest maternal complications. Eastern states together account 25 per cent of total maternal complications. Bihar, Jharkhand and West Bengal rank in the first three and contribute the largest percentage in maternal complications. Thus, the paper aims to analyse the level of prevalence of maternal complications in the eastern states of India. Further, an attempt has also been made to explore the spatial variation in maternal complications and the factors associated with it.

METHODOLOGY

The study is based on District Level Household Survey and the areas selected for the study are the eastern states *i.e.* Bihar, Jharkhand, West Bengal and Odisha. In DLHS, the total of 123449 ever-married women from selected states was interviewed out of which 117022 were currently married. The sample size included in DLHS for Bihar, Jharkhand, West Bengal and Odisha are 44339, 25775, 20542 and 26366 respectively. To examine the level of maternal complications among currently married women, complication during pregnancy, delivery and post-delivery has been included. Further, to analyse district-wise variation in the level of maternal complications in the eastern states, choropleth mapping technique with the help of GIS is used.

RESULTS

Level of maternal complications in the Eastern States:

Table 1 shows the level of complication before pregnancy, delivery and post-delivery among eastern states of India. It indicates that the levels of prevalence in all the eastern states are above the national average (80.2 %). The highest maternal complication is observed is Bihar (93.3 %), followed by Jharkhand (92.2 %), West Bengal (91 %) and Odisha (82.8 %). Among eastern states, Bihar has the highest pregnancy-related complication (75 %) followed by West Bengal (70 %), Jharkhand (66 %) and Odisha (58.5 %). In the case of delivery-related complication highest is observed in Jharkhand (83.5 %) and Bihar observes the highest post-delivery related complication (57.4 %).

Complications	Bihar	West Bengal	Jharkhand	Odisha	India
Pregnancy complications	75.4	70.8	66.1	58.5	57.8
Delivery complications	81.3	73.1	83.5	68.8	61.1
Post delivery complications	57.4	45.9	46.7	33	36.8
Any complications during maternal period	93.3	91	92.2	82.8	80.2

Source: DLHS, III

District-wise analysis of maternal complications:

The Fig. 1 shows a pregnancy complication reported by currently married women across the districts in the study area. It clearly indicates that except Odisha all the district of Bihar, Jharkhand and West Bengal have a high reporting of pregnancy-related complications. It varies from 33.7 per cent in Malkangir to 88 per cent in Samastipur. A large number of districts *i.e.* 14 districts in Bihar falls in the highest category. The highest reporting of pregnancy complications in Bihar above 85 per cent is observed in Samastipur, Khagaria, Katihar and Purba Champaran. Similarly in West Bengal, four districts *i.e.* Koch Bihar, West Medinipur, North twenty-four Parganas and South Twenty-four Parganas falls in the highest category. In the case of Jharkhand, only Garhwa district falls in the highest category and the rest in the high and medium category. Almost all the districts of Bihar, Jharkhand and West Bengal falls in the highest, high and medium category of pregnancy complications except Muzaffarpur, Nawada, Godda, Sahibganj, Deoghar and Dhanbad. Unlike other eastern states, a large number of districts in Odisha has a low reporting of pregnancy complications.

The Fig. 2 depicts the highly skewed reporting of delivery-related complications. It varies from 23.8 per cent in Malkangir to as high as 92.9 per cent in Sheohar. The highest reporting of complication is observed in Bihar and Jharkhand. The districts with the highest complications are observed in some pockets. Except for some districts, all the districts of Bihar, Jharkhand and West Bengal falls under the highest, high and medium category. In Bihar three districts *i.e.* Purnia, Nawada and Bhabua have the lowest reporting of delivery related complications. In West Bengal, Nadia district has the lowest reporting of complications with 58 per cent. In Odisha, more than 50 per cent of all districts fall under the low and

lowest category. The highest complications are observed in only three districts *i.e.* Debagarh, Nuapada and Sonapur with 88.7 per cent, 87.4 per cent and 87.1 per cent, respectively. The lowest of 23.8 per cent observed in Malkangir.

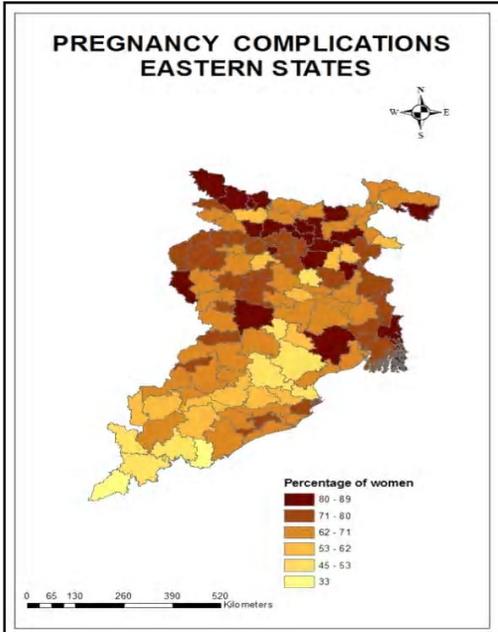


Fig. 1 : Pregnancy complications Eastern States

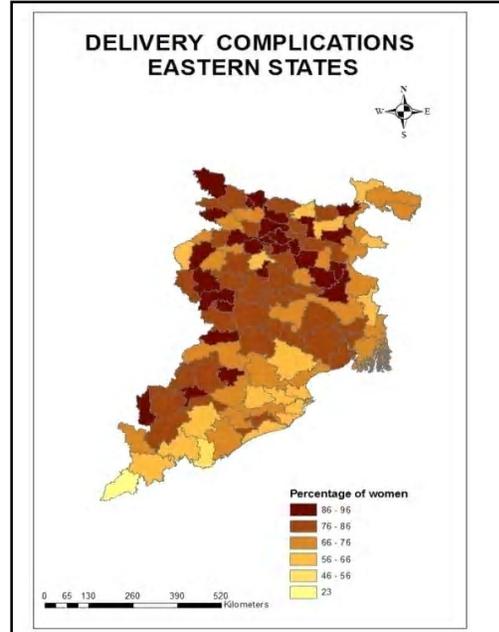


Fig. 2 : Delivery complications Eastern States

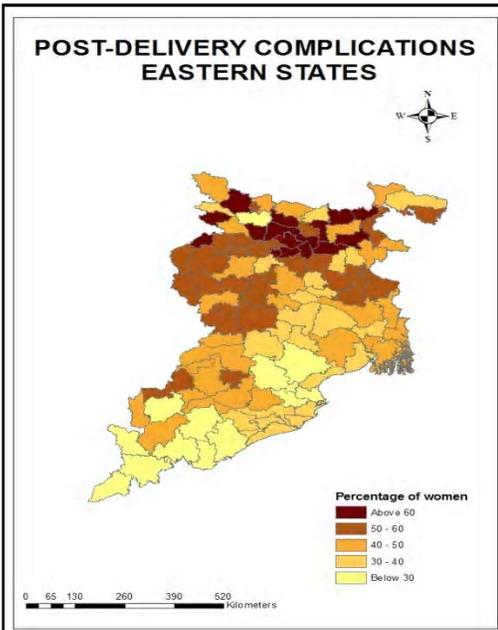


Fig. 3 : Post-Delivery complications Eastern States

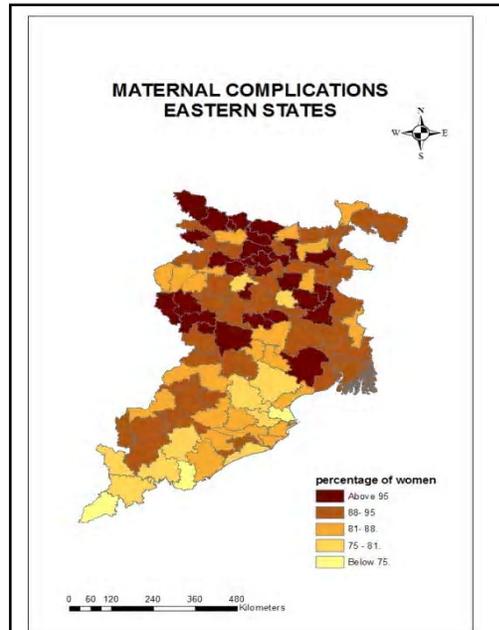


Fig. 4 : Maternal complications Eastern States

Bihar has the highest reporting of post-delivery complications (Fig. 3). The post-delivery complications in eastern states vary from 16.6 per cent in Bhadrak to 79.3 per cent in Samastipur. The highest reporting of post delivery complications above 70 per cent is observed in the district of Samastipur, Kishanganj, Khagaria and Begusarai. All these districts fall in the state of Bihar. The lowest reporting of post-delivery complications in Bihar is observed in the district of Muzaffarpur. In Jharkhand the highest complications are observed in Hazaribagh with 61.2 per cent and in West Bengal, the complications are highest in Murshidabad with 60.6 per cent. No district of Odisha falls into the highest category. The districts that fall in a high category are Debagarh and Bargarh with 52.5 per cent and 50.8 per cent, respectively. All the southern and northeastern district of Odisha has very low post-delivery complications and the lowest below 20 per cent is observed in Bhadrak, Nabarangapur, Gajapati, and Malkangiri. A similar pattern of maternal complication is also observed in Fig. 4.

DISCUSSION AND CONCLUSION

The level of maternal complications during pregnancy, delivery and post-delivery is very high in all the eastern states. The reporting of post-delivery complications in all the selected states are very low as compared to the pregnancy and delivery complications which may be due to the underreporting of post-delivery complications because in many society post delivery complications are usually ignored and considered normal. The overall maternal complications in eastern states are above the national average of 80.2 per cent. The highest maternal complications are observed in the district of Bihar and Jharkhand this is mainly due to the high percentage of women gets married in lower ages. Out of total currently married women, 68 per cent got married before the legal age of 18 years set by the government (Srinivasan *et al.*, 2015). Besides these other factors like high birth order, high illiteracy rate, low living standard, low antenatal care and low institutional delivery may be responsible for high maternal complications in the state of Bihar. Unlike Bihar, a large number of districts in Odisha has low reporting of maternal complications. This is mainly due to the high health-seeking behaviour of women. Around 84 per cent of currently married women receive any antenatal care which is much above the national average of 75 per cent (DLHS III, 2007-08). Another reason for low complications in Odisha may be due to low birth order. Around 41 per cent of women in Odisha prefer low birth order. Further compared to other eastern states the institutional delivery is also high in Odisha. In West Bengal, Nadia district has the lowest reporting of maternal complications which is quite obvious because the coverage of antenatal care is very high. Around 99 per cent of women receive any antenatal care and 26 per cent full antenatal care. The percentage of institutional delivery is also high with 70 per cent and safe delivery with 70.6 per cent (DLHS III, 2007-08). However, the highest maternal complications in the district of Murshidabad, West Bengal could be due to the low mean age at marriage *i.e.* around 62 per cent of women got married before the legal age of 18 years as set by the government.

It is also interesting to note that a geographical constraint which determines the accessibility and affordability of the health care services has emerged as an explanatory factor to some extent. The district of Bihar, Jharkhand and West Bengal which falls in the

Indo Gangetic plain have the highest complication. It is a densely populated area and the coverage of population per health services is usually high. Distinct patches of high complications have been identified in Bihar and Jharkhand. The coastal part of Odisha which includes the districts of Baleshwar, Puri, Bhadrak, Kendrapara and Jagistipur has low maternal complications because the physical access *i.e.* population coverage per public health service is relatively better in the case of coastal districts. It also has a better infrastructure like roads, electricity. The districts are mostly inhabited by non-tribes and are far more developed than those located in the interior, inhabited largely by tribal communities.

The findings also indicate that the variations in the maternal complications across district may be due to the variation in health-seeking behaviour, educational level, living standard as well as under-reporting in some of the cases. The health situation of currently married women in some districts is very deplorable. The situation is worst in the state of Bihar followed by Jharkhand and West Bengal. The state of Odisha is comparatively better than the other eastern states. Almost all the districts of eastern states except Odisha have a high reporting of maternal complications.

REFERENCES

- Geubbels, E. (2006). Epidemiology of Maternal Mortality in Malawi. *Malawi Medical Journal: the J. Medical Association of Malawi*, **18**(4):206-225. DOI: 10.4314/mmj.v18i4.10923.
- International Institute for Population Sciences (IIPS). (2010). District Level Household and Facility Survey (DLHS-3), 2007-08: India. Mumbai: IIPS.
- Jain, K., Goli, S. and Arokiasamy, P. (2012). Are self reported morbidities deceptive in measuring socio-economic inequalities. *The Indian J. Medical Res.*, **136**(5) : 750–757.
- Jejeebhoy, S.J. (1997). Addressing Women's Reproductive Health Needs: Priorities for the Family Welfare Program. *Economic & Political Weekly*, **32**(9 &10): 475-484.
- Jejeebhoy, S.J. and Rao, S.R. (1993). Unsafe motherhood: a review of reproductive health in India. In M. Das Gupta, L. Chen and T.N. Krishnan, (eds.), *Health and Development in India* (forthcoming).
- Mayank, S., Bahl, R., Rattan, A. and Bhandari, N. (2001), Prevalence and correlates of morbidity in pregnant women in an urban slum of New Delhi, *Asia-Pacific Population J.*, **16**/2, <https://doi.org/10.18356/bf294dce-en>.
- Menken, J., Duffy, L. and Kuhn, R. (2003). Childbearing and Women's Survival: New Evidence from Rural Bangladesh. *Population & Development Review*, **29**(3) : 405-426. <http://www.jstor.org/stable/3115280>.
- National Research Council (US) Committee on Population; Reed HE, Koblinsky MA, Mosley WH, editors. *The Consequences of Maternal Morbidity and Maternal Mortality: Report of a Workshop*. Washington (DC): National Academies Press (US); 2000. APPENDIX A, Definitions. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK225430/>
- Patra, S., Singh, B. and Reddaiah, V.P. (2008). Maternal morbidity during postpartum period in a village of north India: a prospective study. *Tropical Doctor*, **38**(4):204-8. doi: 10.1258/td.2008.070417. PMID: 18820182.
- Patwardhan, M., Eckert, L. O., Spiegel, H., Pourmalek, F., Cutland, C., Kochhar, S., Gonik, B. and

- Brighton Collaboration Maternal Death Working Group (2016). Maternal death: Case definition and guidelines for data collection, analysis, and presentation of immunization safety data. *Vaccine*, **34**(49): 6077–6083. <https://doi.org/10.1016/j.vaccine.2016.03.042>.
- Sontakke, P., Reshmi, R.S. and Sebastian, D. (2009). Obstetric Morbidity among Currently Married Women in selected States in India. *J. Family Welfare*, **55**: 17-26.
- Srinivasan, P., Khan, N., Verma, R., Giusti, D., Theis, J. and Chakraborty, S. (2015). District-level study on child marriage in India: What do we know about the prevalence, trends and patterns? New Delhi, India: International Center for Research on Women.
