Original Article

"Infant deaths' audit: Contextual factors contributing to Infant deaths in tribal district-Valsad, Gujarat (India)"

Bansal Shikha*, Shah Harsh**, Gaonkar Narayan***

*Ex Health Consultant, Valsad district, Gujarat
**RMNCH+A Consultant, Gujarat
***Health Specialist, UNICEF, Gujarat

DOI: 10.5455/jrmds.2015333

ABSTRACT

Background: A high Infant Mortality Rate (IMR) is suggestive of unmet health needs; especially to those who need health service the most. A number of community and facility based interventions under the umbrella of RMNCH+A strategy have been implemented to deal with infant mortality. But the number of Infant deaths continues to remain very high. The present study was aimed to understand pattern and various factors affecting Infant deaths by studying the existing review system of Infant death through analysis of Infant death verbal autopsy forms filled during year 2012-13 for Valsad district of Gujarat.

Materials and Methods: The study was a descriptive study where verbal autopsy forms for all deaths in 2012-13 were collected and analyzed.

Results: The contribution of Neonatal Mortality in the total Infant Mortality was 70 %. Of all the infants who died, 52 % were low birth weight babies and 8.1% had extreme low birth weight. Those Infants who were delivered at home (21.5%), 8% received medical care while 92% died without receiving any medical assistance. Prematurity followed by low birth weight and congenital anomalies were found to be the major reasons for infant deaths.

Conclusion: Implementation and increasing the access of high impact cost effective interventions are possible at community and facility level to accelerate reduction in infant mortality and can be linked with existing preventive, promotive and curative health programs. Opportunities like NHM to bridge system loopholes, robust monitoring system and meticulous record keeping are needed to improve decision making process.

Key words: Infant deaths, verbal autopsy, low birth weight babies, health interventions

INTRODUCTION

Infant Mortality Rate (IMR) is an indicator of well-being of children below the age of one year. A high IMR is an indicator of risk of death during first year of life and is suggestive of unmet health needs; especially to those who need health service the most and are prone to unfavourable environmental factors. More than half of the world's under-five deaths occur in 5 countries and India contributed to 24% of all Under-Five Deaths of the world [1]. The states of India show variable rates of infant mortality rate ranging from states like Goa, Kerala Tamil Nadu and Maharashtra who have already attained the target while some others like Assam, Madhya Pradesh and Uttar Pradesh falling far behind. Gujarat, a progressive state of India is striving to decrease the infant mortality by improving access and quality of health services. The State has witnessed a 59.4 percent decline in IMR over a period of 13 years, i.e. from the year 2001 to year 2013. [2] Though the state has witnessed a decline in Infant Mortality over the years, the rate of decrease has been slow especially Neonatal Mortality. The latest estimate of Under 5 Mortality Rate (U5MR) and Neonatal Mortality Rate (NMR) of 45 per 1000 live births and 26 per 1000 live births respectively for Gujarat is available from 2013 report of SRS, Office of Registrar General, India. The Infant Mortality Rate of Gujarat as per SRS Bulletin 2013 was reported to be 36 per 1000 live births.[3] As per the agreed Millennium Development Goal (MDG) no. 4, the target is to achieve reduction in Child Mortality by two-thirds by 2015 with the baseline year 1990. The MDG target of Under 5 Mortality for India is to achieve 38 per 1000 live births by 2015. This clearly suggests that reducing IMR and NMR is crucial to achieve MDG.

As per the global experience, more than half of the early childhood deaths are due to preventable or treatable causes which can be dealt with by access to simple, affordable interventions. The leading causes are pneumonia, preterm birth complications,

diarrhoea and malaria. [4] A number of home based, outreach and facility based interventions under the umbrella of RMNCH+A strategy have been implemented to deal with Neonatal and Infant Mortality and to improve Maternal and Child Health outcomes. Some of the services provided at the community and outreach service delivery is to reduce IMR are village health and nutrition day, routine immunization, Integrated Management of Neonatal and Childhood Illnesses (IMNCI) and Home Based New Born Care (HBNC). These services can prove extremely beneficial in addressing major causes of Infant deaths at the community level. Others are provided at the facility level in form of curative services along with provision of new born care (NBCC/ NBSU/ SNCU) as contribution of Neonatal deaths to Infant Mortality Rate is substantial. These key high impact interventions, if implemented effectively can combat the issue of Infant Mortality to a great extent.

The present study was aimed to understand pattern and contextual factors affecting Infant deaths by studying the existing Infant Death Verbal Autopsy system through analysis of all the available verbal autopsy forms during year 2012-13 for Valsad district of Gujarat, which is a tribal district. The verbal autopsy of Infant deaths is a tool to identify the system deficiencies and delays in providing appropriate care at facility and community levels that are needed to be address childhood illnesses during infancy. Systematic analysis of Infant deaths also provides information of delays at various levels and measures to fill the gaps in order to prevent such delays in future.

MATERIAL AND METHODS

Study Design and settings

The study design was a descriptive study where record based data from the primary health centres of the Valsad district had been collected. In the present study, the source of the information was the existing infant death reporting system in the form of verbal autopsy of the infant death, submitted by medical officers of the primary health centres to the district health office.

Data Collection

Infant Death Reporting System

The pretested verbal autopsy form has to be filled up after every infant death by medical officer of the each primary health centres and it is uniform to all the primary health centres. The Primary Health Centre acts as a nodal centre for verbal autopsy of all infant deaths in their respected community. The informant (FHW/ ASHA/ Aaganwadi worker) telephonically informs the concerned PHC Medical Officer and the FHW sends the primary informant form filled within 24 hours to the concerned PHC Medical Officer. The PHC Medical Officer along with FHW, AWW and ASHA forms the investigating team (minimum three members) to conduct verbal autopsy after taking consent of family members. The verbal autopsy forms for each infant death are submitted to District Nodal officer (Reproductive and Child Health Officer) and infant death report from each PHC is submitted to the district administration on a monthly basis. For this study, the pretested forms for infant death verbal autopsy were obtained from the district health department which were submitted by the primary health centres the detailed analysis was done from the collected information. With the permission of chief district health officer, without revealing infant names; the analysis was done on available information extracted from the forms. 214 of 302 forms were completely filled and remaining forms were included only for the available information.

Statistical analysis

Valsad district reported a total of 345 infant deaths in the financial year 2012-13. The verbal autopsy forms for 302 deaths were available and retained at the district health department. The data was analysed using Microsoft Office Excel 2007 and SPSS ver. 17. The frequency analysis and by Chi Square test; association between variables have been applied to establish statistical significance.

RESULTS

Valsad district, having a population of over 17 lakhs, reported 27423 live births in the financial year 2012-13. As per the IMR of the state (38/1000 live births; SRS 2012), the estimated infant deaths was 1042 for the district. Against this estimate, 345 infant deaths were reported by Valsad district in HMIS 2012-13 (33.1% of the estimated). The verbal autopsies were done for all the deaths but verbal autopsy data is available for 87.5% deaths at the district. The detailed analysis was done as below:

Contribution of Neonatal mortality (Figure -1)

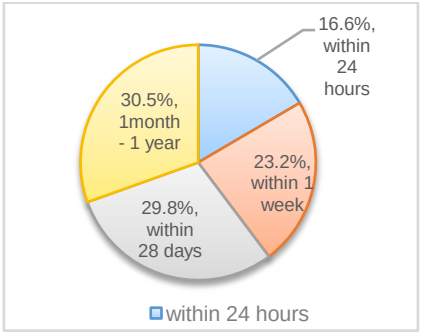

Figure -1 Age at Death of infant deaths in Valsad district 2012-2013 (N = 302)

The share of neonatal mortality in the total infant mortality was as high as 70 % in Valsad in the year 2012-13. Majority of these neonatal deaths were early neonatal deaths in one week of birth. Early neonatal deaths constituted 40 % of the total infant deaths.

Low birth weight babies (Figure - 2)

All the infants who died, 52 % were low birth weight babies and 8.1% had extreme low birth weight less than one kg. Out of all these low birth weight babies, 45 percent died in first 7 days of life while another 38 percent died within one month. Of all the low birth weight infants who died within early neonatal period, 23 percent died within 7 days at home without receiving any treatment from any health personnel.

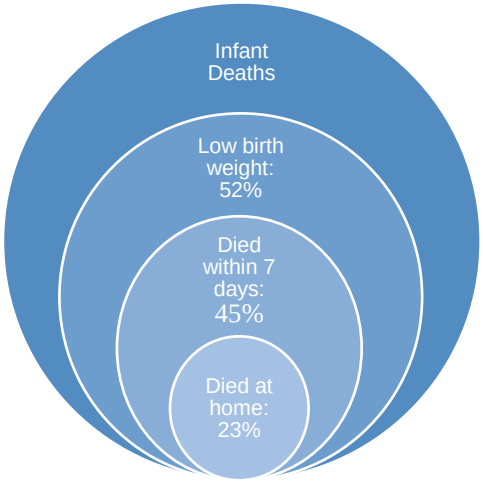

Figure -2 Deaths of low birth weight infants in Valsad district 2012-2013 (N = 296)

Place of Infant Death vs. Place of Birth (Table-1)

Here, Table 1 showed on place of death versus place of birth of the Infants who died in Valsad in the year 2012-13. There was a significant association between place of birth and place of death in the study. The Present study showed that those infants who were delivered at home (21.5 %), out of those; only 8 percent received medical care while 92% died without receiving any medical assistance due to first delay. The infants who were delivered at hospital (78.4%), out of that 56% were able to reach hospital for any kind of treatment and 54.3% infants had died at home without any primary treatment.

Table – 1 Place of infant death vs. place of birth (N = 232)

Place of Birth	Place of death			X^2 test value & p value
	Home	Hospital	Total*	
Home	46	4	50	34.6
Hospital	80	102	182	p<0.0001
Total*	126	106	232	

Major reasons for infant deaths (Figure- 3)

The analysis of causes for infant deaths in Valsad district during year 2012-13 depicted that prematurity followed by low birth weight and congenital anomalies were the major reasons for infant deaths and together accounted for over 45 percent of the infant deaths. Respiratory failure and pneumonia were also the major reasons contributing to over 17 percent of the total deaths.

DISCUSSION AND RECOMMENDATION

The global recognition of Infant Mortality as a sensitive indicator and major area of concern is well reflected in the country's policy and health programs. Though Infant Mortality has been declining over past few years, there is a growing concern that NMR decline is not fast enough to achieve Millennium Development Goal (MDG) 4 in stipulated time frame i.e. till 2015. [5, 6] Also as per Indian Newborn Action Plan (2014) aligned with

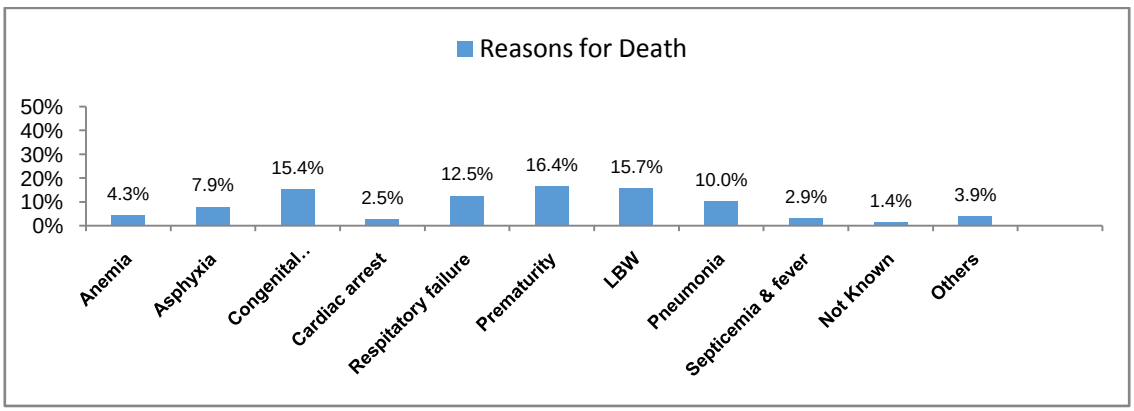

Figure – 4 Reasons for infant deaths in Valsad 2012-2013 (N = 280)

Every Newborn Action Plan is providing direction to reach the specific single digit NMR and SBR. Therefore, galvanized efforts and systematic actions are needed by the Government and the Development Partners to reach mothers and infants with effective care. Implementation and expansion of high impact and cost effective interventions that target main causes of Neonatal and Post Neonatal Deaths are possible at both the community and facility levels to accelerate reduction in IMR and can be linked with existing preventive and curative health programs.

The current findings show substantial contribution of Early Neonatal and Neonatal Deaths to Infant Mortality. The day of birth is also a significant contributor among total Infant Deaths. Similar findings have been documented from other countries like Kenya and Tajikistan as well. [7,8] Neonatal Mortality, covering the deaths within first month of birth is of interest because the health interventions needed to tackle the causes of Neonatal Mortality generally differ from those needed to tackle other Infant and Under 5 Deaths. Addressing Neonatal Mortality is increasingly important because it has declined at a much slower rate than Infant Mortality in the State. [1]This accentuates the need for focused attention on facility based services and simultaneously community based interventions like institutional deliveries, effective implementation of home based new born care, IMNCI, robust referral mechanisms and 48 hours stay at health institution after delivery of the baby. The role of institutional deliveries in reducing Post-Neonatal Morality was also documented from other countries like Kenya.[7]Similarly, the role of effective implementation of IMNCI/HBNC in improving Neonatal survival is evident from other parts of India. [9] Strengthening of Facility Based New Born Care (FBNC) in terms of infrastructure and ample human resource is also indispensable to address NMR. Opportunities like annual Project Implementation Plan under NHM for each district can be optimally utilized to bridge these system gaps and provide quality services to Newborn at the facility level. Likewise, strengthening of outreach programs would be extremely beneficial in promoting awareness (demand generation) on appropriate care of the Newborn and Infants. For example, early and compulsory post natal home visits by trained health personnel are effective in promoting desirable behaviours like exclusive breastfeeding. [10] Also, interventions like IMNCI provide greater possibility for early recognition of danger signs and case management of neonatal infections, pneumonia and other major causes for neonatal and infant deaths.[11, 12, 13] Intensification of low cost interventions like Kangaroo Mother Care can combat deaths due to preterm and low birth weight to a great extent [14, 15]. Additionally, to ascertain effective implementation of outreach and facility based programs for infants, an inbuilt robust monitoring and evaluation system with ample scope for supportive supervision to the program implementers is of utmost importance. This would not only ensure successful implementation of the programs but would also augment the confidence and earnestness among the program implementers on Child Health issues. In the present study, much information was missing from the verbal autopsy forms which if available would be more helpful in analysis. So, meticulous record keeping and data management of all the Infant deaths is fundamental to help analyse the situation and prioritize actions accordingly.

Though very limited scientific based information is available on cause-specific mortality rates from developing countries and is to a certain extent true for Gujarat also, this information is crucial for taking corrective actions, utilizing available resources efficiently and policy decision making. Therefore, the State needs to develop a system to identify the geographical pockets with high mortality and morbidity to prioritize its actions to accelerate the decline of the mortality rates through robust implementation of these high impact interventions.
The study findings on contextual factors also emphasized on necessity for a policy level decision to initiate a structured infant death review system at the implementation level. This would help to analyse the system gaps contributing to infant deaths and rectify them accordingly. This would also be instrumental in identifying the areas with high mortality and directive to focus the system actions to hasten the declining of the mortality through effective program implementation.

CONCLUSION

Implementation and increasing the access of high impact cost effective interventions are possible at community and facility level to accelerate reduction in infant mortality and can be linked with existing preventive, promotive and curative health programs. Opportunities like NHM to bridge system loopholes, robust monitoring system and meticulous record keeping are needed to improve decision making process.

REFERENCES

1. Levels and trends in child mortality, estimates developed by the UN Inter-agency Group for Child Mortality Estimation. New York: UNICEF,

2012.Available from: http://www.unicef.org/media/files/Child_Mortality_Report_2011_Final.pdf. [Last accessed on 2013 November 20]
2. RGI. Sample Registration System. Annual Reports. Office of Registrar General, Ministry of Home Affairs. New Delhi. 2001-12. Available from: http://www.censusindia.gov.in.html [Last accessed on 2013 November 20]
3. RGI. Sample Registration System Bulletin. Office of Registrar General, Ministry of Home Affairs. New Delhi. September 2013. Available from:http://www.censusindia.gov.in/vital_statistics/SRS_Bulletins/Bulletins.html [Last accessed on 2013 November 20]
4. World Health Organization. Media Centre Fact sheet; 2013. Available from http://www.who.int/mediacentre/factsheets/fs178/en/ [Updated September 2013; Last cited on 2013 November 20]
5. NIMS, ICMR and UNICEF, Infant and Child Mortality in India: Levels, Trends and Determinants, New Delhi 2012.
6. Operational Guidelines on Home based New born care. Ministry of Health and family Welfare, Government of India. 2011. Available from: http://www.nihfw.org/pdf/NCHRC-Publications/Operational%20Guidelines%20on%20Home%20Based%20Newborn%20Care%20(HBNC).pdf. [Last accessed on 2013 November 20]
7. UNICEF Tajikistan. Infant Mortality in Tajikistan two studies look at risk factors. Child Research Digest, No. 4. Available from http://www.unicef.org/tajikistan/Article_4_Eng.pdf [Last accessed on 2013 November 20]
8. The World Bank. What has Driven the Decline of Infant Mortality in Kenya? Policy Research Working Paper 6057. May 2012. Available from http://econ.worldbank.org[Last accessed on 2013 November 20]
9. Improved neonatal survival after participatory learning and action with women's groups: a prospective study in rural eastern India. Bulletin of the World Health Organization 2013; 91: 426- 433 B. Available from http://www.who.int/bulletin/volumes/91/6/12-105171/en/ [Last accessed on 2013 November 20]
10. Guidelines for enhancing optimal Infant and Young Child Feeding (IYCF) practices. Ministry of Health and family Welfare, Government of India, 2013Available from: http://nrhm.gov.in/nrhm-components/rmnch-a/child-health-immunization/child-health/guidelines.html. [Last accessed on 2013 November 20]
11. Operational Guidelines on Integrated Management of Neonatal and Childhood Illnesses. Ministry of Health and family Welfare, Government of India. February 2011. Available from: http://nrhm.gov.in/nrhm-components/rmnch-a/child-health-immunization/child-health/guidelines.html. [Last accessed on 2013 November 20]
12. Gwatkin DR. Integrating the management of childhood illness. Lancet 2004, 364:1557-58
13. Patralekha Chatterjee. India's efforts to boost neonatal survival. Lancet 2006; 368: 1055.
14. March of Dimes, the Partnership of Maternal, Newborn, Child Health, Save the Children, World Health Organization. Born too soon: the global action report on preterm birth. Geneva, 2012. Available From: http://www.who.int/pmnch/media/news/2012/201204_borntoosoon-report.pdf. [Last accessed on 2013 November 20]
15. Lawn JE, Mwansa-Kambafwile J, Barros FC, Horta BL, Cousens S. 'Kangaroo mother care' to prevent neonatal deaths due to pre-term birth complications. Int J Epidemiol 2010, 39; 1:144-54.

Corresponding Author:

Dr. Harsh Shah
Block-B, 403
Swagat Rainforest-2,
Near Kudasan,
Gandhinagar-382421
Email: harsh.423@gmail.com

Date of Submission: 09/06/2015
Date of Acceptance: 23/09/2015

How to cite this article: Bansal S, Shah H, Gaonkar N. "Infant deaths' audit: Contextual factors contributing to Infant deaths in tribal district of Valsad, Gujarat (India)". J Res Med Den Sci 2015;3(3):171-5.

Source of Support: None
Conflict of Interest: None declared