The Clarion Volume 9 Number 1 (2020) PP 17-23
The Clarion
International Multidisciplinary Journal
ISSN : 2277-1697

Infant mortality among slum dwellers in Dibrugarh city, India: the categorical causes.

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Abstract

Slum dwellers are the most considerable but overlooked section of the Indian society. The slum people of India are treated like third rate citizens in their own country. They are characterised by having inefficient living areas, a growing population living below the poverty line, nil drinking water, and latrines shared among hundreds, a non-existent sewage system. The inaccessibility to basic living conditions results in a "slum lifestyle" modelled by several characteristics. The lives of these people are illustrated by high rates of poverty and their socio-economic condition does not push them to live a healthy life. The present study makes an effort to explain the possible causes of infant mortality with special regard to slum households in Dibrugarh City, India. The study is based on primary data collection through field work, secondary data collection and use of statistical methods wherever required. Findings indicate birth asphyxia (35.30%) is the highest cause of the infant death in the neonatal period, along with significant observations with respect to other diseases. A huge 29.41% of post neonatal death infant stands as an unknown cause of mortality in the study area. Therefore, findings of the present study not only have lager implications in terms of understanding the infant mortality scenario of slum areas but also will help in framing adequate policies for uplifting their standard of living as well as basic well-being.

Keywords: slums, neonatal mortality, infant mortality, poverty, Dibrugarh

1. Introduction

The level of infant mortality is regarded as a basic indicator of health, quality of life and development in a society. It has been seen that, the risk factors and the causes of death during infancy are many times taken to be same; but there always lies a difference between the two. A cause directly links to a death where, a risk factor of infant death just makes the death more possibly to happen (Gupta and Baghel, 1999). Generally, the cause of death during infancy is recorded on the death certificate signed by a medical person, in terms of the immediate precursor cause along with other certain influential conditions associated with the death (Sovio, et al., 2012). But things are getting complicated with the absence of death registration. In that context, it becomes very tough to explain the causes of infant death. Therefore, in order to considerable reduce the extent of death of children under the age of one; there arise a continuous need to explore the possible causes of it (Sarkar and Sahu, 2018).

There are different causes of infant mortality, starting from infections and maternal complications to birth defects, preterm birth (Singh and Singh, 2018), suffocation, sudden infant death syndrome and accidents (EKS National Institute of Child health and Human Development). According to UNICEF most of the child death happens due to any one or the combinations of the causes mentioned as- acute infections, respiratory diseases, diarrhoea, malaria, malnutrition and measles (Ahmed,et al., 2015). WHO also states various causes of infant mortality, which are: pneumonia (lung swelling caused by bacterial infection), diarrhoea (loose or watery stools as a result of viral infection), malaria (caused by a parasite known as Plasmodium, that spread through the bites of infected mosquitoes), measles (an infectious viral

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DOI number: 10.5958/2277-937X.2020.00004.0

disease through the form of fever (Eaton, et al., 1986) and a red rash, mainly occurring in the childhood) and HIV (mainly caused by the progressive failure of the immune system). In a previous study it is mentioned that, infant deaths happen mostly because of preterm birth, respiratory syndromes including the lung infection, bronchitis, diarrhoea and influenza (Bosma, 2006). As analysed by Vaid et al., (2007) in their paper "*Infant Mortality in an Urban Slum"*, it was revealed that in a slum of Vellore, Tamil Nadu, the cause of neonatal deaths were perinatal asphyxia, pre-maturity and aspiration pneumonia or acute respiratory diseases; while the cause of post neonatal deaths were diarrheal diseases and respiratory infections.

It is well known that slum dwellers in India experience considerably higher levels of socioeconomic disadvantages than other urban residents (Awasthi and Agarwal, 2004; Sultana, et al., 2019). Urban slums are settlements, neighbourhoods, or city regions that cannot provide the basic living conditions necessary for its inhabitants or slum dwellers, to live in a safe and healthy environment As per 2001 census, 42.6 million people of India live in slums which constitute 4 % of the total population and 15 % of the total urban population of India. According to the 2011 census, slum population of India has increased and it is 65.5 million which constitute 5 % of the total population and 17.4 % of the total urban population of India. Population living in slums support the need for better standards of living, health care for children and health care safe deliveries in these areas (Borah and Rajkhowa, 2017). During the NFHS-1 in 1992, in India, the infant mortality rate recorded for poorer urban communities, for the preceding 5 years period was 76 per 1000 live births. After that, during NFHS-3, differential by slum/ non slum residence does not show a consistent pattern regarding infant mortality. In Delhi, Meerut, Indore, Nagpur and Chennai, the IMR is much higher in slum areas than in non-slum areas. In the other 3 cities, the IMR is considerably higher in non-slum areas than in slum.

The present study makes an effort to explain the possible causes of infant mortality with special regard to slum households in Dibrugarh City, India.

2. Materials and method

2.1 Study area

In the present study, Dibrugarh town has been selected, as it carries the highest slum population i.e., 13.37% of the total slum population of Assam. The reference period of this study is 5 years i.e., from January 2014 to December 2018.

2.2 Sampling method

The study is based on primary data collection through field work, secondary data collection and use of statistical methods wherever required. Samples have been collected by following a multi-stage sampling technique, both purposive and random.

2.3 Selection of sample households

Slum areas are spread in different wards of Dibrugarh municipality. For selection of sample households, 10% HHs are selected randomly from each slum, and this way, the number of samples HH becomes 424.

2.4 Respondent selection criteria

For the collection of data regarding the information of infant mortality, one married woman of the re-productive age group is taken as the respondent and has been interviewed for the purpose from each household randomly. Women married only once have been included in the sample.

2.4 Data collection

The required primary data have been collected by an appropriate and detailed interview schedule from the respondents of the study area. The data collection was completed in a period of 24 days from 10th Oct, 2019 to 2nd Nov, 2019. Secondary sources include the Census of India, 2011, Dibrugarh Municipality Board, Demographic Health Survey, Economic Survey Assam, 2014-2015, National Family Health Survey-4, Sample Registration System (SRS), Statistical Handbook Assam, 2014, books, journals, newspaper and various websites.

3. Results and discussion

3.1 Present status of slum dwellers in Dibrugarh

Dibrugarh is the third largest urban area of Assam, and it has the highest number of slum population according to census 2011. The total population of Dibrugarh town is 145488, where slum population is 27089, i.e. the percentage of slum population to total town population of Dibrugarh is 18.62%. Dibrugarh has 10 notified slum areas viz, Paltan Bazar, Gangapara, Grahambazar, Pathanpatty, Tulsigaon, Santipara Horizon Colony, Loharpatty, Mirzabag, Tinkunia and Dibrujan with about 4242 households (Dibrugarth Municipality Board). Table 1 shows the slum population profile of Dibrugarh town as per census 2011.

Table 1: Slum population profile of Dibrugarh town

Sl. No.	Name of Slum	Slum population	No. of slum households
1	Paltanbazar	5658	790
2	Gangapara	2022	240
3	Grahambazar	5658	1095
4	Pathanpatty	1091	102
5	TulsiGaon	1011	123
6	SantiparaHarizon Colony	1948	470
7	Loharpatty	2951	570
8	Mirzabag	1624	142
9	Tinkunia	2548	170
10	Dibrujan	2578	540
Total	**Dibrugarh**	**27089**	**4242**

Source: Dibrugarh Municipality Board

With regard to the present study, the data corresponding to household sampling in the present study have been enumerated in Table 2.

Table 2: Sample households of slums in Dibrugarh town

Sl. No.	Name of slum	Ward no	No. of HHs	Sample HHs
1	Santipara	12	470	47
2	Loharpatty	9,10,11	570	57
3	Pathanpatty	4,5	102	10
4	TulsiGaon	5	123	12
5	Paltanbazar	22	790	79
6	Dibrujan	22	540	54
7	Gangapara	20,21	240	24
8	Grahambazar	17	1095	110
9	Mirzabag	8	142	14
10	Tinkunia	17	170	17
Total	**Dibrugarh**		**4242**	**424**

3.2 Causes of infant mortality in study area

In the present analysis, a total of 51 numbers of infant death have been found during the reference period in the study area. In this section, effort has been made to explain the possible causes of infant mortality which has been done by asking about the causes of it to the respondents of the sample population. Though death registration is completely zero among all of the 51 cases of infant death, therefore explanations about the causes of death of infancy are given as are reported by the respondents of the slum population during the reference period. The following table 3 explains the

causes of infant death in the study area during the reference period as reported by the respondents.

Table 3: Causes of infant death in the study area recorded during field survey

Neonatal period (total 34 numbers of infant death)					
Male			**Female**		
Causes of death	**No. of infant death**	**Percentage**	**Causes of death**	**No. of infant death**	**Percentage**
SIDS	2	11.11	SIDS	2	12.5
don't know	3	16.67	don't know	4	25
Sepsis	4	22.22	Sepsis	4	25
Aspiration pneumonia	2	11.11	Aspiratory pneumonia	1	6.25
Birth asphyxia	7	38.89	Birth asphyxia	5	31.25
Total	18	100	Total	16	100
Post neonatal period (total 17 numbers of infant death)					
Male			**Female**		
Causes of death	**No. of infant death**	**Percentage**	**Causes of death**	**No. of infant death**	**Percentage**
Accident	2	14.29	Accident	0	0
SIDS	1	7.14	SIDS	0	0
don't know	4	28.57	don't know	1	33.33
Pox	1	7.14	Pox	0	0
Enteritis	1	7.14	Enteritis	0	0
Diarrhoea	1	7.14	Diarrhoea	0	0
Bronchitis	1	7.14	Bronchitis	1	33.33
Fever	3	21.43	Fever	1	33.33
Total	14	100	Total	3	100

Source: Field survey data

From the above table, it has been found that in the neonatal period, birth asphyxia (35.30%) is the highest cause of the infant death i.e. out of those 34 infants who are unable to complete their first weeks of life, 12 infants face the problem of birth asphyxia as reported by the respondents in the study area during the reference period.

Birth asphyxia also known as perinatal asphyxia or neonatal asphyxia is a major medical problem faced by a newborn. In the neonatal period, when a baby is not able to receive enough oxygen during, previous or just after birth, this deprivation of oxygen to a new born child causes severe physical distress, mainly to the brain. This in turn pushes up the chances of death during neonatal period. Birth asphyxia mainly happens because of insufficient levels of oxygen in the mother's blood and the low level of blood pressure of the mother. Therefore, extra prenatal and post-natal care including the extra oxygen giving to the mother before delivery, arrangement of immediate C-section delivery, assessing

the ventilation and medicos dose essential for the baby's normal breathing and blood pressure etc. are must to prevent the problem of birth asphyxia. In our study, where from the data it is revealed that, out of total 51 infant death, only 31.37% infant's mother take the antenatal care where 23.53% infant's mother take the postnatal care. That means maximum mother of the cases of death infant doesn't take any antenatal (68.63%) and post-natal care (76.47%). Therefore, in that case the problem of birth asphyxia might be experienced at a greater extent and creates the most possible causes of infant death during the neonatal period.

Other common causes of neonatal death in the study area include infections (32.35%) and SIDS-sudden infant death syndrome (11.76%). Out of those infant deaths due to infection, 72.73% neonatal death happens due to sepsis and 27.27% neonatal death happens due to aspiration pneumonia. In the case of remaining 20.59% of the total neonatal deaths, causes are not known to the respondents, therefore it can be said that this 20.59% stands as the unknown cause of the mortality during neonatal period as reported by the respondents.

Neonatal infections are gained during the first four weeks of life of the new born. Most of the infectious are caused by bacteria, which normally live in the birth vessel. The new born baby is easily affected by them and it is easily spread to baby's lungs and bloodstream. Sepsis, aspiration pneumonia are some common neonatal infections. Usually neonatal sepsis depicts the presence of bacterial blood stream (BSI) in the form of fever. Generally, sepsis infection occurs in a new born baby within the 90 days of his/her life. New born with low birth weight or prematurity easily affected by sepsis and create a negative response to the survival of the new baby. Aspiration pneumonia is a type of neonatal infections which usually result the lung infections. Generally, with the symptoms of fever, shortness of breath; the problem of aspiratory pneumonia could be detected. To prevent all of these neonatal infections, the most important thing is to provide proper hygiene and sanitation, health care facilities including vaccination of the mother during pregnancy and the child after the birth until the 1st 4-6 weeks of life. In our study, where, slums are characterized as the most unhygienic, inhabited group of population with poor sanitation and lack of basic amenities, it is revealed from the previous chapter that the vaccination of the child have a significant impact on the infant mortality. From the data it is find that out of total 51 infant death, vaccination is taken by only 23.53% infants whereas vaccination is not taken among a huge percentage of infants to the total death infant i.e. 76.47%. It might create poor immunization sand thereby infectious diseases which in turn cause the infant mortality. Sudden infant death syndrome also known as cot death or crib death is one of the major causes of infant death. Typically, the causes of SIDS are unexplained or unknown while it generally occurs during the sleep of the baby. Some clinicians believe that SIDS is related to the low oxygen level or an increase of carbon dioxide during the sleep of the baby. In our study as reported by the sample population 11.76% neonatal deaths are due to SIDS. More specifically, out of total 34 neonatal deaths, 4 neonatal deaths are due to SIDS which actually have a great concern to discuss.

For male death infants during the neonatal period, the most common cause of death are birth asphyxia (38.89%) i.e. out of total 18 male death infant, 7 infants are died due to the cause of birth asphyxia during the neonatal period; followed by infections (33.33%) and SIDS- sudden infant death syndrome (11.11%) as reported by the respondents. Out of those male infant deaths due to infection, 66.67% neonatal male death happens due to sepsis and 33.33% neonatal male death happens due to aspiration pneumonia for the males in the study area. For female death infants during the neonatal period, the most common cause of death are birth asphyxia (31.25%) and infections (31.25%) i.e. out of total 16 female death infant, 5 female infants are died due to the cause of birth asphyxia and another 5 female infants are died due to the cause of infections during the neonatal period in the study area as reported by the respondents. Out of those female infant deaths due to infection, 80% neonatal female infant death happens due to sepsis and 20% neonatal female infant death happens due to aspiration pneumonia in the study area as reported by the respondent. For the male death infant, 16.67% stands as the unknown cause of mortality where for the female death infant, 25% stands as the unknown cause of mortality during the neonatal period in the study area as reported by the respondents.

In the post neonatal period, maximum infants are died due to suffering from fever (23.53%) i.e. out of 17 infants who are died after completing their 1st four weeks of life but before completing their 1st birthday, 4 infants are died due to the cause of fever as reported by the respondents in the study area during the reference period. The other most common causes of deaths have been found in the study area during the

post neonatal period as reported by the respondents are communicable diseases (17.65%), bronchitis (11.76%), accidents (11.76%) and sudden infant death syndrome (5.88%). The communicable diseases include the presence of three severe diseases in the study area among the post neonatal deaths. These are: pox, enteritis and diarrhoea. Out of the total 17 post neonatal infant deaths, one infant has died due to suffering from pox, one has died due to enteritis and another one has died due to diarrhoea. Out of those infant deaths due to communicable diseases, 33.33% post neonatal death happens due to pox, 33.33% post neonatal death happens due to enteritis and another 33.33% post neonatal deaths happens due to diarrhoea. Among the post neonatal deaths, most of the causes are remain unknown also. Data from field survey reveals that out of total 17 post neonatal deaths, the causes of 5 neonatal infants' death are not known by the respondent. Therefore, a huge amount i.e. 29.41% of post neonatal death infant stands as an unknown cause of mortality in the study area during the reference period.

In the post neonatal period the causes of death are mainly due to exogenous variables. In this period mortality are mainly affected by the social, economic, demographical and environmental factors. During this period, communicable diseases including both of the digestive system and respiratory system are seemed as the most common cause of death. Communicable diseases are caused by some bacteria, virus, parasites and fungi that can be spread directly or indirectly from one person to another (WHO). Pox, enteritis, diarrhoea is some kind of a digestive system communicable diseases. Bronchitis, pneumonia is some kind of respiratory diseases. Pox is mainly due to a virus called varicella zoster (WHO). In a post neonatal period where communicable contagious diseases play a vital role to create the mortality, Pox has a great contribution to create contagious diseases which can push up the chance of even death also. Enteritis includes all of the gastritis where swelling is occurred in the small intestine. Fever is another important cause of infant death during the post neonatal period. Enteritis, diarrhoea is mainly due to poor hygiene and sanitation. Bronchitis is one of the common illness of respiratory diseases in the post neonatal period which are actually caused by the respiratory syncytial virus. It actually irritates the new born in the lung and airways which in turn may cause the trouble of cough and breathing of the post neonatal child and create a great possibility to establish the cause of infant death. In the study area it is also revealed that during the post neonatal period, accidents also cause the death of the child. In slum areas, it is noticed that most of the slum dwellers being poverty stricken are always engaged in looking for various means for the sustenance of life. Since, they get too much involved in this process for a better living; they become negligent towards their children many times. As a result, the children are prone to various accidents due to lack of care, as they are not looked after well.

For male infant death, the most common causes during the post neonatal period are fever (21.43%), followed by accidents (14.29%), SIDS (7.14%), pox (7.14%), enteritis (7.14%), diarrhoea (7.14%) and bronchitis (7.14%). A huge percentage 28.57 of male death infant to the total male death infant during the post neonatal period stands as the unknown cause of mortality. For female death infant, the most common causes of death during the post neonatal period are fever (33.33%) and bronchitis (33.33%) where another 33.33% stands as the unknown cause of mortality in the study area as reported by the respondents.

4. **Conclusion**

In the present study, it has been observed that birth asphyxia (35.30%) is the highest cause of the infant death in the neonatal period, i.e. out of those 34 infants who are unable to complete their first weeks of life, 12 infants face the problem of birth asphyxia as reported by the respondents in the study area during the reference period. The other common causes of neonatal death in the study area include infections (32.35%) and SIDS- sudden infant death syndrome (11.76%). Out of those infant deaths due to infection, 72.73% neonatal death happens due to sepsis and 27.27% neonatal death happens due to aspiration pneumonia. In the case of remaining 20.59% of the total neonatal deaths, causes are not known to the respondents, therefore it can be said that this 20.59% stands as the unknown cause of the mortality during neonatal period as reported by the respondents. In the post neonatal period, maximum infants are died due to suffering from fever (23.53%) i.e. out of 17 infants who are died after completing their 1st four weeks of life but before completing their 1st birthday, 4 infants are died due to the cause of fever as reported by the respondents in the study area during the reference period. The other most common causes of deaths have been found in the study area during the post neonatal period as reported by the respondents are communicable diseases (17.65%), bronchitis (11.76%),

accidents (11.76%) and sudden infant death syndrome (5.88%). The communicable diseases include the presence of pox, enteritis and diarrhoea. Out of the total 17 post neonatal infant deaths, one infant died due to suffering from pox, one died due to enteritis and another one died due to diarrhoea. Among the post neonatal deaths, most of the causes are remain unknown also. Data from field survey reveals that out of total 17 post neonatal deaths, the causes of 5 neonatal infants' death are not known by the respondent. Therefore, a huge amount i.e. 29.41% of post neonatal death infant stands as an unknown cause of mortality in the study area during the reference period. Therefore, findings of the present study not only have lager implications in terms of understanding the infant mortality scenario of slum areas but will also help in framing adequate policies for uplifting slum households' standard of living as well as social well-being.

5. Acknowledgment

This paper is based on one of the objectives of my M.Phil dissertation submitted at Department of Economics, Dibrugarh University, 2020. I would like to express my deepest gratitude and sincere appreciation to my supervisor Dr. Nayanmoni Bargohain Baruah, Assistant Professor, Department of Economics, Dibrugarh University for her continuous encouragement and constant guidance during the tenure of the research work. I would also like to express my heartiest gratitude to all the teachers of Department of economics, Dibrugarh University, for their continuous support, guidance and advice.

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