



## CAUSES OF DEATHS AMONG CHILDREN BELOW FIVE YEARS USING VERBAL AUTOPSY TOOL IN DEHARADUN, INDIA

Sushil Dalal<sup>1</sup>, Devidas T Khedkar<sup>2</sup>, Jitendra S Bhawalkar<sup>3</sup>

**Financial Support:** None declared  
**Conflict of interest:** None declared  
**Copy right:** The Journal retains the copyrights of this article. However, reproduction is permissible with due acknowledgement of the source.

### How to cite this article:

Dalal S, Khedkar DT, Bhawalkar JS. Causes of Deaths among Children below Five Years Using Verbal Autopsy Tool in Deharadun, India. Ntl J Community Med 2016; 7(3):226-228.

### Author's Affiliation:

<sup>1</sup>Asst Prof ; <sup>2</sup>Asso Prof; <sup>3</sup>Prof & Head, Department of Community Medicine, Dr. DY Patil Medical College, Hospital & Research Center, Pune

### Correspondence:

Dr Sushil Dalal  
drsushildalal123@gmail.com

**Date of Submission:** 10-06-15

**Date of Acceptance:** 01-07-15

## ABSTRACT

**Background:** In India about 2.1 million child deaths occur every year. However causes of deaths remain uncertain as many deaths occur outside health system. The study was conducted to find out causes of deaths using verbal autopsy in Dehradun.

**Methodology:** The survey was done on all the house of the deceased children residing in our field practice areas by visiting their houses.

**Results:** there were 83 deaths reported during study period which shows that five most common causes of deaths in children were pneumonia, milk aspiration, and birth asphyxia.

**Conclusion:** Most of the under five children deaths can be prevented by regular and effective training programmes for health care providers and pregnant females whereas early recognition of danger signs and early referral system can save many precious lives.

**Key words** Developing countries, health programmes, deceased children, Pneumonia, Malnutrition.

## BACKGROUND

Information on causes of death is extremely important for policy-making, planning, monitoring and evaluation of health programmes, as well as necessary for field research, comparisons, and epidemic awareness. This is particularly more so important for childhood deaths, which constitutes a major portion of all deaths, and of which many intervention programmes are currently attempting to reduce<sup>1</sup>. In the past five to seven years, the importance of verbal autopsy – derived mortality data as a source of comparative population health outcome statistics has grown rapidly, making the necessity to standardize approaches all the more compelling. Because of the lack of standard data collection and cause – of- death attribution and tabulation procedures, however, the comparability of these precious information sources is seriously limited<sup>2</sup>. Keeping in view of the limited number of population based studies conducted on under five mortality as well as its importance attached to planning and organization of child health services

and valuating the effectiveness of health interventions, an attempt is being made through the present study to validate the cause of death determination by using verbal autopsy.

## METHODOLOGY

The study was undertaken for one year in the field practice areas of department of community medicine, HIHT, Dehradun after taking approval of institutional ethical committee. The total population registered under Rural Health Training Centre (Rajeev Nagar) & Urban Health Training Centre was 12,588 and 12,930 respectively and under five children were 1297 and 1325 respectively.

All deaths except still births registered with Rural and Urban Health Training Centre were included in the study. When a child died, the mother or the respondent was questioned in details about the symptoms of the child prior to death. A detailed history from the time of birth of the baby till his / her death was elicited from the mother / care tak-

er. A drafted questionnaire (English version) developed by WHO, was modified suitably, as well as certain variables were added to it to find out the cause of the death<sup>2</sup>. The information so collected, was first coded and then entered in the computer. The analysis was done by using SPSS software. Appropriate statistical methods (proportion and chi - square test) were applied as per requirement.

## RESULTS

Total number of deceased children in both the areas were 83, out of which 39(46.9 %) were in rural area and 44 (53.1 %) in urban area. Out of 39 deaths

in rural area, 29 (74.4 %) died before the age of one year while 10 (25.6 %) died in age group of 365 days - < 5 year. Similarly in urban areas 44 deaths took place. Out of these 25 (56.8 %) died below age of 1 year and 19 (43.2 %) died in age group of 365 days- < 5 year. The infant mortality rate was 37.2/1000 in rural, 23.9/1000 in urban area and combined IMR came out to be 29.6/1000 live birth.

The table no 1 shows that among all the deceased children (83), proportionately more male children (44) had died than the females (39). However, the gender difference in death in rural as well as urban area was statistically insignificant ( $P>0.05$ ).

**Table 1: Distribution of deceased children by age, sex and place of residence (n=83)**

	Deaths (%)		Total deaths	Chi square value	Degree of freedom	P value
	Rural (n=39)	Urban (n=44)				
<b>Age of deceased children</b>						
0-28 days	17 (43.6)	15 (34.1)	32 (38.6)	<b>3.219</b>	2	> 0.05
29-<365 days	12 (30.8)	10 (22.7)	22 (26.5)			
365 days-< 5Yrs	10 (25.6)	19 (43.2)	29 (34.9)			
<b>Sex of deceased children</b>						
Male	18 (46.2)	26 (59.1)	44 (53.0)	<b>1.389</b>	1	> 0.05
Female	21 (53.8)	18 (40.9)	39 (47.0)			

**Table 2: Distribution of deceased children by cause of death and place of residence (n=83)**

Causes of deaths	Diseased Children		
	Rural (n=39) (%)	Urban (n=44) (%)	Total (n=83)
Pneumonia	8 (36.3)	14 (63.7)	22
Milk aspiration	9 (64.2)	5 (35.8)	14
Birth asphyxia	6 (60)	4 (40)	10
Congenital Heart D	2 (33.3)	4 (66.7)	6
Diarrhoea	2 (50)	2 (50)	4
Prematurity	0 (0)	2 (100)	2
meningitis	2 (66.6)	1 (33.4)	3
Malnutrition	2 (67.6)	1 (33.4)	3
Measles	1 (50)	1 (50)	2
Other	7 (41.1)	10 (58.9)	17

Most common causes of deaths in children were pneumonia, milk aspiration, birth asphyxia, congenital heart disease and diarrhea (table 2). The three major causes responsible for children's death in rural area were milk aspiration ( 23 % ), pneumonia ( 21 % ) and birth asphyxia ( 15 % ). Similarly the top 3 main causes of death in children in urban area were pneumonia ( 32 % ), milk aspiration ( 11 % ), birth asphyxia and congenital heart disease ( 9.1 % ) each. Diarrhoea was cause of death in 5.1 % cases in rural area and 4.5 % cases in urban area.

## DISCUSSION

This present study shows that the neonatal, post neonatal and infant mortality rates were 14.3, 9.5 and 23.9 per 1000 live birth in urban area. There

was however no significant difference observed between rural and urban area. The finding of IMR in our study (29.6) is somewhat lower than of state of Uttarakhand. According to NHFS - 3 Uttarakhand<sup>3</sup> infant mortality rate in Uttarakhand has remained almost constant over time. Infant mortality is currently estimated at 42 deaths before the age of one year per thousand live births, slightly up from the NHFS - 2 estimates of 38. One in 24 children dies within the first year of life. Infant mortality is three times higher in rural areas than in urban areas.

A retrospective study done by Vaid A et al (2007)<sup>4</sup> in urban slum found that the infant mortality rate over the period from 1995 to 2003 IMR was 37.9/1000 live births. S Thora et al<sup>5</sup> also reported more than one fourth of the total deaths occurring in the first year of life were mainly during the neonatal period. He observed this finding in study done in 12 aganwadi centres in slums of Jabalpur city. The under five mortality in the present study 0 - 5 years was 50.1/1000 for rural , 42/1000 urban and 45.5/1000 in total. NFHS - 3 (Uttarakhand)<sup>3</sup> reported the under 5 mortality rate of 75.3/1000, 53.6/1000 and 57/1000 live births in rural, urban and combined respectively. Direct comparison of mortality rates with other authors in the 0-5 year's group could not be made because the authors in classifying mortality used different age groups. Victora et al (1992)<sup>6</sup> reported that the cumulative risk of early childhood mortality of 5.6/1000 in Brazilian cohort. Study done by S. K. Ray et al

(1992)<sup>7</sup> reported deaths of <5 yrs of age ( 149/1000 live births ) contributed 47 % of all mortality in India. Binka et al (1995)<sup>8</sup> reported the child mortality rate in children aged (1 – 4 years) as 16.9 / 1000 for Ghana. NFHS – 3, India (2005)<sup>9</sup> reported under – five mortality for India as 87 / 1000 live births.

Our study shows that neonatal and post neonatal mortality was more among the males (72.7%) than among the females (56.4%) however the difference was not statistically significant. According to NHFS – 3 Uttarakhand<sup>3</sup> girls and boys experience the same level of infant mortality (55/1000 live births) , girls experience much higher post neonatal mortality than do boys, and boys experience higher neonatal mortality than do girls. Brock (1996)<sup>10</sup> also found that there was no significant difference in mortality between sexes. Nongkynrih et al (2003)<sup>11</sup> also observed that 60 % of infant deaths in the age groups 29 days to 1 year occurred in females. A study done by Fauveau et al (1991)<sup>12</sup> observed that out of 667 children who died aged 1–4 years in Matlab study area, 423 were females (62.5%). The overall risk of dying was 1.8 times higher for female children relative to male children aged 1 – 4 years. Badari S. ( 1991 )<sup>13</sup> in his study reported that male infants were more likely to die than female infants (113 v/s 90; p 0.05), especially in the neonatal period (76 v/s 48; p 0.01).

Out of total 32 neonatal deaths in our study, the three major cause of death in this age group was due to milk aspiration, birth asphyxia followed by pneumonia where as pneumonia was major cause of death in post neonatal age group .14 deaths were also reported whose causes were unspecified. Congenital heart disease Diarrhoea, Malnutrition, Meningitis and Measles were also reported but they were few in numbers. Most of the death due to milk aspiration could have been prevented by providing health education to mothers. Whereas congenital heart disease would have been diagnosed and treated earlier if provisions of screening and affordable treatment facility are made available to lower socio economic group. Deaths due to birth asphyxia can be prevented if the deliveries are conducted in institution by trained personnel. Nandan et al (2005)<sup>14</sup> in their study reported diarrhoea pneumonia severe malnutrition, measles and high grade fever as the cause of death. Nongkynrih (2003)<sup>11</sup> also found PEM diarrhea, pneumonia, birth asphyxia, prematurity as the major causes of death in children under the age of five years. Awasthy and Agarwal ( 2003 )<sup>15</sup> reported pneumonia, Diarrhoea disease, malnutrition formed the major cause of death from urban slums of Lucknow. Shrivastava et al ( 2001)<sup>16</sup>, in their study observed that prematurity including LBW was the most important cause of neonatal deaths. Other

important causes of neonatal deaths were birth injury asphyxia and neonatal sepsis. Our study also indicates more or less similar results in accordance of previous studies.

## CONCLUSION

Milk aspiration, Pneumonia, Birth asphyxia constituted the major causes of death in children < 5 years. Most of the under five children deaths can be prevented by regular and effective training programmes for health care providers and pregnant females whereas early recognition of danger signs and early referral system can save many precious lives.

## REFERENCES

1. Bang AT, Bang RA, Diagnosis of causes of childhood deaths in developing countries by verbal autopsy: suggested criteria W.H.O. bulletin 1992; 70(4): 499-507.
2. Development of verbal autopsy standards. Available from URL:[http://www.who.int/whosis/mort/verbal autopsy standards 1.pdf](http://www.who.int/whosis/mort/verbal_autopsy_standards_1.pdf).
3. National family health survey (NFHS – 3),Uttarakhand. International Institute for Population sciences Deonar, Mumbai – 400 088. 2005 – 2006.
4. Vaid A, Mammen A, Primrose B, Kang G. Infant mortality in an urban slum. Indian J Pediatr 2007; 74: 449-53.
5. Thora S, Awadhya S, Chansoriya M, Kaul KK. Perinatal and infant mortality in urban slums under ICDS scheme. Indian Pediatr 1986; 23:595-8.
6. Victora CG, Barros FC, HuttlySRA et al. Early childhood mortality in a Brazilian Cohort: The roles of Birth weight and socio economic Status. International Journal of Epidemiology. 1992 Vol 21 (5),p911-915.
7. Ray SK, Kar M, Lahir S, Sen Gupta D, Chaudhari N. Some aspects of two under five deaths in an urban field practice area. Indian J Matern Child Health 1992; 3: 23-5.
8. Binka FN, Maude GH, Gyapong M et al. Risk factors for child mortality in Northern Ghana: A case - Control study. tnt J Epidemiol 1995; 24(1): 127-135.
9. NFHS –3 India. Available from URL: [www.nfhsindia.org](http://www.nfhsindia.org).
10. Broeck JVD, Eeckels R, Massa G. Maternal Determinants of child survival in a rural African Community. tnt J Epidemiol 1996;25(5):998-1004.
11. Nongkynrih B, Anand K, Kapoor SK. Use of Verbal Autopsy by health workers in under-five children. Indian Paediatrics 2003;40:766 –71.
12. Fauveau V, Koeing MA, Wojtynaik B. Excess female deaths among rural Bangladeshi children, an example of cause specific mortality and morbidity. International journal of Epidemiology 1991; 20:729-35.
13. Badari S, Gopal YS, Devaramani SC . Infant mortality, its components and correlates: Findings from a longitudinal study in rural Karnataka, India. Genus 1991; 47(1-2): 89-108.
14. Nandan D, Misra SK, Jam M. Social audits for community action: a tool to initiate community action for reducing child mortality. Indian J Commun Med 2005;30(3):78 – 80.
15. Awasthy S, Agarwal S, Determinants of childhood mortality in urban slums in India. Indian Paediatr 2003; 40: 1145-61.
16. Shrivastava SP, Kumar A, Ojha AK. Verbal autopsy Determined Causes of Neonatal Deaths. Indian Pediatrics.