



Cause Specific Infant Mortality in University of Nigeria Teaching Hospital, Enugu: A Demographic Study

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ABSTRACT

Cause specific death rate is the death as a result of a particular cause. It is essential for understanding the overall epidemiological profile of disease in a population over time. This paper has examined the cause specific infant mortality in University of Nigeria Teaching Hospital Enugu. In identifying the magnitude of all causes of death, correlation analysis result indicates that out of sixteen causes considered for the period under study, the significant causes were Septicemia, Malaria, IUD, Pneumonia, Gastroenteritis, Still birth, Asphyxia and Aneamia. However, four leading causes were identified as Septicemia, Malaria, Neonatal Sepsis and Pneumonia. Considering mortality variation among gender, Analysis of Variance result with p-value of 0.729 revealed that infant mortality is the same for both gender. It is pertinent to mention that infant mortality is actionable since all the identified leading causes are preventable; this calls for more dedication on both parents and health officials.

Keywords: Mortality, Cause specific death, Infants, Neonatal, Rates and Hospitals.

INTRODUCTION

Cause-specific Mortality is a net mortality measure representing mortality due to a specified cause in the absence of other causes. The estimates are calculated by specifying the cause of mortality. In other words, Cause-specific Mortality Rate is the mortality rate from a specified cause for a population during a specified time period. The study of cause-specific mortality is important as it helps in understanding the overall epidemiological profile of disease in a population over time. Studies have shown that adequate functional system that produce regular statistics on causes of death lacks in many countries [4, 6]. Particularly in Sub-Saharan Africa, there is limited information on cause-specific mortality [1].

In an attempt to identify useful cause-specific mortality data, [2] conducted a major review of epidemiological studies and identified a total of 48 research studies from 16 countries that met specific criteria, which are related to data definition and data quality issues for inclusion in analyzing cause specific mortality. They also noted that studies on cause specific mortality should include reports on the relative magnitude of all causes of death instead of focusing on a single or a few causes, methods used to derive the cause of death, age groups reported, site, and period of the study. Studies have shown that cause specific mortality varies from region to region. Some were of the view that respiratory infections, diarrhea, malnutrition, and anemia were the leading causes of death in children under Five Years [4]. While others have it that malaria, diarrheal diseases,

and malnutrition were the leading causes of death among school-age children and acute respiratory infections (ARI) are the third leading cause of death globally among children under five years of age [5]. However, in Nigeria, due to the climatic condition that makes it suitable and stable for the existence and transmission of malaria, it has been noted that malaria is one of the major causes of mortality, and children are the worst affected, especially children ranging from 6 months to 5 years [3, 7].

Other causes of infant mortality are Septicemia, Gastroenteritis, Neonatal sepsis and Asphyxia. In a study by Richard and Sarah [8], out of four thousand and twenty-one consecutive blood cultures obtained from infants and children from 1956 to 1962, 198 patients show clinical evidence of septicemia. The overall mortality was 30%. 1/4th of the patients were newborn babies with 38% mortality rate; while another 1/4th were children with chronic underlying disease, with 53% mortality rate. Gastroenteritis is an infection of the gut (intestine). It is common among children who may have more than one episode in a year. The severity ranges from mild tummy upset for a day or two with mild diarrhea to severe diarrhea and vomiting for several days or longer.

This shows that some of the causes of infant mortality are inter related, preventing one may lead to preventing the other. Considering the gender that is mostly affected, some were of the view that males are affected most [6]. Therefore this study

is interested in identifying the cause specific infant mortality and the magnitude of various causes of infant mortality in University of Nigeria Teaching Hospital, Enugu in Enugu state.

MATERIALS AND METHODS

In line with the study by Adetunji [2], there was no specific method used to derive the cause of death, rather causes

were recorded as deaths occur on the site. The data for this study were collected from Statistics department of University of Nigeria Teaching Hospital, Enugu for a period of ten years, from 1998-2007, where data exists. The data were further classified according to causes over the years under study, causes by Age interval and causes by gender. Causes over the period under study were presented on table 1 below.

Table 1 Causes of Death by Years

Causes of Death Years	Septicemia (Sept.)	Intra-uterine Death (IU D)	Diarrhea (Diar)	Pneumonia (Pneu)	Gastroenteritis (Gastro)	Septic shock (Sept choc.)	Neonatal Sepsis (Neo.s ep)	Malaria (Mal)	S till Birth	Asphyxia(Asp)
1998	46	15	-	35	28	3	27	51	6	22
1999	40	1	1	7	7	1	7	17	-	6
2000	18	-	-	11	8	-	10	22	-	3
2001	16	-	-	14	3	1	17	23	-	1
2002	9	-	-	5	3	8	10	15	--	5
2003	27	-	-	6	8	19	15	12	-	7
2004	16	-	-	10	5	14	17	12	-	3
2005	6	-	-	6	4	15	11	5	-	7
2006	8	-	-	6	2	11	24	5	-	4
2007	7	-	-	5	4	12	9	6	1	4
Total	193	16	1	105	72	84	147	168	7	62
Average	19.3	1.6	1	10.5	7.2	8.4	14.7	16.8	0.7	6.2

Table 1 continues; Causes of Death by Years

Causes of Death Years	Dehydration (Dehy)	Nephroblastoma (Neo.bla)	Respiratory Failure (RF)	Anemia (Ane)	Meningitis (Men)	Prematurity (Pre.Mat)	Total
1998	3	1	4	23	11	19	40
1999	-	-	-	12	3	2	12
2000	1	-	1	10	8	-	12
2001	3	-	-	15	4	1	12
2002	1	1	3	6	3	1	10
2003	1	-	2	4	-	1	15
2004	-	1	2	6	1	2	12
2005	1	2	2	4	1	-	99
2006	-	-	2	3	1	2	93
2007	1	1	1	3	-	-	54
Total	11	6	17	63	32	28	13
Average	1.1	.6	1.7	6.3	3.2	2.8	13

In identifying the magnitude of all causes of death as suggested [2], correlation analysis was carried out and the result shows that Septicemia has 1.000, Intra Uterine death (IUD) has 1.000, Pneumonia has 0.668, Gastroenteritis has 0.789, Malaria has 0.757, Still birth has 1.000, Asphyxia 0.685, and Aneamia has 0.758 correlation coefficient at 5% significance level. This indicates that they are the significant contributors out of the sixteen causes considered. With the availability of Infant population over the period under study, the cause specific death rate can be calculated using the formula:

$$\text{Death due to cause A/ Population at time T} * 100\%$$

The numerator is the number of deaths from a particular cause, and the denominator is the size of the population at the mid-point of the time period.

In considering the age groups affected, the data were classified according to the following age groups in months as presented on table 2 below;

Table 2 Causes by Age group.

Ag gp (m)	Sept	IUD	Diar	Pnu	Gas tro	Sept. Shoc	Neo Sep	Mal	Asp	Dehy	Neo bla	RF	Ane	Men.	PreM at.
0-3	58	16	-	24	12	17	87	7	61	5	-	5	4	12	28
4-7	37	-	1	26	15	20	13	28	-	4	-	2	13	1	-
8-11	29	-	-	22	17	15	13	23	-	1		3	7	2	-
12+	69	-	-	33	28	32	34	110	1	1	6	7	39	17	-
Total	193	16	1	105	72	84	147	168	62	11	6	17	63	32	28

Table 2 shows that mortality due to Intra uterine death, Asphyxia, and Prematurity were associated with newborn babies alone. Other causes are spread among the various age groups

Further consideration on gender mostly affected, the number of mortality over the years of study by gender were presented on table 3 below;

Summing the mortality for the period under study as on table 3 suggests that the total infant mortality is higher in male than in

the female gender. To test for this variation, the following hypothesis is tested using Analysis of variance tool;

The hypothesis is stated thus;

$H_0 : \mu_1 = \mu_2$ (implying that there is no mortality variation in both genders)

Vs

$H_1 : \mu_1 \neq \mu_2$ (implying that there is mortality variation in both genders)

Table 3 Mortality by Gender

Year	Males	Females
1998	223	180
1999	56	64
2000	61	52
2001	65	53
2002	51	52
2003	82	74
2004	67	57
2005	56	43
2006	43	50
2007	26	28
Total	730	653
Average	73	65.3

Table 4 ANOVA Table for Infant Mortality with Respect to Gender

Gender	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	296.450	1	296.450	.124	.729
Within Groups	42926.100	18	2384.783		
Total	43222.550	19			

Table 4 shows the SPSS output which indicates F – test of 0.124 with P-value of 0.729 at $\alpha = 0.05$. Therefore we accept the null hypothesis and conclude that the average mortality in both genders is the same.

ANALYSIS

Table 1 shows that for the period under study, the four leading causes were Septicemia, Malaria, Neonatal Sepsis and Pneumonia in that order. For all the causes, 1998 recorded the highest mortality with a total of 403 deaths while the lowest was in 2007 with a total of 54 deaths. This reduction could be attributed to awareness. Considering causes by age group, table 2 shows that Children above one year of age were more susceptible to Septicemia followed by the new born babies. This follows the findings of Richard and Sarah. Malaria is the second leading cause and it affects children above one year of age more. Closer look at table 2 reveals that mortality due to malaria increases from the age interval of (4-7) to 12+. This also follows previous studies that malaria mostly affects children between the ages of 6 months to 5 years. Furthermore, Neonatal sepsis and Asphyxia could be said to be the most infant killer disease going by the number of mortality recorded and age interval affected based on this study. Mere observation on table 3 suggests that male mortality is higher than female mortality. However Analysis of variance has proved otherwise by the acceptance of hypothesis of equal variances.

In conclusion, this study has identified the four major causes of Infant mortality in University of Nigeria Teaching hospital Enugu as Septicemia, Malaria, Neonatal Sepsis and Pneumonia. It is pertinent to mention that all the causes are preventable; an attempt to prevent one may also help in preventing the other which in turn reduces infant mortality.

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