



## A COMPARATIVE STUDY ON MORBIDITY AND FETAL DEATH DURING PREGNANCY IN RURAL AND URBAN MOTHERS AT VELLORE DISTRICT

S. Peter<sup>1</sup> and Dr. R. Ravanan<sup>2</sup>

<sup>1</sup>Ph.D. Research Scholar, Department of Statistics, Manonmaniam Sundaranar University,  
Tirunelveli, Tamil Nadu.

<sup>2</sup>Principal, Department of Statistics, Presidency College, Chennai, Tamil Nadu.

### ABSTRACT

*The aim of the present study is to describe the variation in the morbidity and fetal death during pregnancy in rural and urban mothers with related factors in a population based prospective study of pregnancies in Vellore district mothers. In this study of morbidity and fetal death rates expressed in different parts of the world are discussed. The associations of morbidity and fetal death with some of its correlation namely, genetic, obstetric, socioeconomic and environmental factors are reviewed with significant variable maternal age, gravida, parity, previous morbidity and fetal death and pregnancy interval on morbidity and fetal death using descriptive statistics.*

**KEYWORDS:** associations of morbidity and fetal death , obstetric, socioeconomic and environmental factors.

### INTRODUCTION

#### Key Facts on Maternal Mortality as per WHO (World Health Organization)

- Approximately 830 women die from preventable causes related to pregnancy and child birth related complications around the world everyday.
- 99% of all maternal death occurs in developing countries.
- Maternal mortality is higher in woman living in rural areas and among poor communities.
- Young adolescents face a higher risk of complications and death as a result of pregnancy than other woman.
- Between 1990 and 2015 maternal mortality worldwide dropped by about 44%.
- Women die as a result of complications during and following pregnancy and child birth. The major complications that account for nearly 75% of all maternal deaths are sever bleeding (after child birth), infections, high blood pressure during pregnancy, complications from delivery and unsafe abortion.

### OBJECTIVE OF THE STUDY

The objective of the study is to describe the association of various stages of morbidity and fetal death with related variables also to examine the effect of the following groups of factors on morbidity and fetal death using Univariate and Multivariate Analysis.

Pregnancy loss affects maternal health and induced abortions performed in unsatisfactory medical settings are deterrent to health and a major cause of adult female mortality. Globally an estimated half a million women die of maternity related causes every year and about 20% of them are due to complications of abortions. The risk of unsuccessful termination of pregnancy due to spontaneous miscarriage or stillbirth is ten times higher in developing countries than in developed ones.



Morbidity and fetal deaths are significant events in reproductive career and are a source of lost fertility of exposure time. Studies on morbidity and fetal death are essential that from view point of health, abortion outside the medical setting is one of the dangerous consequences relating to the unwanted pregnancies.

### Variables

**Biological Factor:** Consanguinity

**Obstetrical Factor:** Maternal Age, Gravida, Pregnancy Interval, And Previous Morbidity and Fetal Death.

### MATERIALS AND METHODS

In this larger systematic and intensive study, the scope was on several aspects of human reproduction especially events of pregnancies and its outcome, birth measurements and longitudinal observations of all live born for one trends to relevant parameters. Thus in a large number of pregnancies observed very highly reliable and accurate information on morbidity and fetal deaths and gestational age were obtained through careful observations.

To answer the related questions it was expected possible to determine two important aspects of community life, family planning and the extent of fetal losses. Thus enabling one to study the incidence and factors influencing morbidity and fetal deaths would help in understanding the high risk factors and promoting maternal health.

One of the significant features of the study was to determine the pregnancy soon after the women has missed the normal menstruation period through five weekly visits. The menstrual data of every eligible woman were obtained by direct interview with the women.

### STATISTICAL METHODS

Univariate statistics were calculated for few continuous maternal variables and to describe the extent of fetal losses among categories of study variables proportions were computed.

Bivariate analysis was carried out in this study for the types of morbidity and fetal deaths with its associated variables. For each of the type of morbidity and fetal deaths namely early, intermediate and late the morbidity and fetal death rates were calculated per thousand pregnancies in each classification of the variable studied.

For the overall morbidity and fetal deaths the trend chi-square test was done to find if there exists any significant linear pattern. The trend in each of the types of the morbidity and fetal death were also tested by considering the live births as controls in each of the variables studied and further tested for significance using chi-square test. For categories variables for presence or absence of the risk factors the odds ratios with 95% confidence intervals were calculated for early morbidity and fetal death and others (the other two types combined).

For the continuous variables which are considered to be influencing the morbidity and fetal deaths, the mean and standard deviation were calculated in each of the types of morbidity and fetal deaths and for live births and tested for the difference between the mean levels.

For all the variables influencing the morbidity and fetal deaths the category of morbidity and fetal deaths by gestation age was analyzed and the association of the gestational age with the variables was tested. The overall chi-square for the contingency table was obtained and the morbidity and fetal death rates were calculated for the total terminations in each category. Trend chi-square was also obtained for testing the linearity in each of the type of morbidity and fetal death considering the live births as controls.

### RESULTS

The mean and standard deviation of few maternal variables, maternal age, gravida parity, pregnancy interval, and previous morbidity and fetal deaths classified by the types of morbidity and fetal deaths and live births are presented in Table-1.

Variable	Morbidity and Fetal death(Weeks)									Live Birth		
	Early			Intermediate			Late					
	(8-19)			(20-27)			≥28					
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
<b>Urban</b>												
Maternal Age	983	*** 27.3	6.8	105	*** 27.5	7.2	132	*** 27.1	6.8	2899	26.2	5.7
Gravida	819	*** 4.3	2.7	104	*** 4.2	2.7	125	*** 4.3	2.7	2846	3.9	2.4
Parity	819	*** 2.9	2.5	104	*** 2.7	2.5	125	*** 2.7	2.5	2846	3.6	2.2
Previous fetal death	819	*** 0.5	1.0	104	*** 0.5	1.0	125	*** 0.7	1.2	2848	0.3	0.7
Pregnancy interval	688	*** 24.0	20.0	88	26.0	19.8	101	31.9	19.8	2362	29.4	16.6
<b>Rural</b>												
Maternal Age	1524	*** 26.4	7.1	132	26.4	6.9	164	* 24.6	6.3	4435	25.7	6.1
Gravida	1324	*** 4.1	2.5	129	3.9	2.2	162	3.5	2.4	4381	3.7	2.2
Parity	1324	*** 2.8	2.3	129	*** 2.5	2.1	162	*** 2.1	2.2	4380	3.5	2.1
Previous fetal death	1325	0.3	0.7	129	0.4	0.7	162	0.4	0.9	4388	0.3	0.6
Pregnancy interval	1121	*** 25.8	17.8	110	*** 25.6	17.3	119	31.8	19.2	3645	30.9	15.2

\*p<0.05, \*\*p<0.01 & \*\*\*p<0.001 levels of significance.

The early morbidity and fetal deaths in urban and rural were characterized by higher maternal age and gravida, and less parity and pregnancy internal than in live births. Previous morbidity and fetal deaths are higher only in urban.

Among the intermediate morbidity and fetal deaths less parity was observed both in rural and urban. Additionally maternal age, and previous morbidity and fetal deaths are higher in urban, where as in rural pregnancy internal is lower among morbidity and fetal deaths than live births.

Higher previous morbidity and fetal deaths and lower parity are among late morbidity and fetal deaths than live births both in urban and rural but maternal age is less in rural in the late morbidity and fetal deaths.

In rural maternal age parity earlier morbidity and fetal deaths pregnancy interval mothers’ education fathers’ education type of food and household size are significantly associated with the nature of termination. Similarly in urban maternal age parity earlier morbidity and fetal death pregnancy internal mother education household size and household income are significant.

**Table 2: Early Morbidity and Fetal Death Rates by Consanguinity**

Consanguinity	Urban				Rural			
	Total Terminations	Live Births	Early Fetal Death		Total Terminations	Live Births	Early Fetal Death	
	N	N	N	Rate	N	N	N	Rate
Yes	1596	1132	374	234.4	2317	1338	807	244.8
No	2526	1740	630	239.9	2136	1289	721	241.7
Total	4122	2872	1004	237.4	4453	2627	1528	243.4

**Table 3: Early Morbidity and Fetal Death Rates by Maternal Age**

Maternal age	Urban				Rural			
	Total Terminations	Live Births	Early Fetal Death		Total Terminations	Live Births	Early Fetal Death	
	N	N	N	Rate	N	N	N	Rate
<=19	464	310	122	262.9	1119	810	256	228.8
20-34	3200	2329	702	219.4	4614	3357	1044	226.3
>=35	566	341	180	318.0	646	386	228	352.9
Total	4230	2980	1004	237.4	6279	4521	1528	243.4
Trend Chi-square				7.06				23.64

Table 4: Early Morbidity and Fetal Death Rates by Gravida

Gravida	Urban				Rural			
	Total Terminations	Live Births	Early Fetal Death		Total Terminations	Live Births	Early Fetal Death	
	N	N	N	Rate	N	N	N	Rate
1	580	433	115	198.3	951	712	185	194.5
2	666	483	145	217.7	1090	802	229	210.1
>=3	2648	1930	559	211.1	3954	2367	910	230.1
Total	3894	2846	819	210.3	5995	3881	1324	220.9
Trend Chi-square				8.31				24.43

Table 5: Early Morbidity and Fetal Death Rates by Pregnancy Interval

Pregnancy Interval (months)	Urban				Rural			
	Total Terminations	Live Births	Early Fetal Death		Total Terminations	Live Births	Early Fetal Death	
	N	N	N	Rate	N	N	N	Rate
< 24	1626	1054	473	290.9	1918	1188	629	327.9
24 – 35	816	678	96	117.6	1701	1386	252	148.1
>=36	1788	1242	435	243.3	2660	1879	647	243.2
Total	4230	2974	1004	237.4	6279	4453	1528	243.2
Trend Chi-square				9.53				32.85

Table 6: Early Morbidity and Fetal Death Rates by Previous Morbidity and Fetal Deaths

Previous Fetal Deaths	Urban				Rural			
	Total Terminations	Live Births	Early Fetal Death		Total Terminations	Live Births	Early Fetal Death	
	N	N	N	Rate	N	N	N	Rate
0	2871	2160	565	196.8	4697	3470	1016	216.3
1	737	508	175	237.4	1025	732	238	232.3
>=2	621	311	264	425.1	557	251	274	491.9
Total	4229	2979	1004	237.4	6279	4453	1528	243.4
Trend Chi-square				143.91				160.43

### Consanguinity

Early and intermediate morbidity and fetal death rates are slightly higher for non- consanguineously married type in urban but in rural this rates were higher for the consanguineously married mothers (Table-2).

### Maternal Age

Early intermediate and late morbidity and fetal death rates by maternal age increased above 34 years of age in both urban and rural. The rates observed are minimum between 20 to 34years. The trends of early morbidity and fetal death rates are significant in urban ( $\chi^2=7.06$ ) and rural ( $\chi^2=23.64$ ) (Table 3).

### Gravida

By gravida, in rural the early morbidity and fetal death rates increased by the gravida 2 and also above 2 (Table-4). The trend is increasing [rural  $\chi^2=24.43$ ]. An increasing trend in intermediate morbidity and fetal death rates for the gravida above 2 in Urban areas [ $\chi^2=8.31$ ] (Table-4). The trend is significant in urban.

### Pregnancy Interval

A U shaped curve for the early morbidity and fetal death rates are observed by the pregnancy interval both urban and rural. These rates are minimum during the two to three years of pregnancy interval. Highest risk is noticed within the first years of the pregnancy interval in both urban and rural. The trends are observed [urban  $\chi^2=9.53$ , rural  $\chi^2=32.85$ ] (Table-5).

### Previous Morbidity and Fetal Deaths

The early morbidity and fetal death rates increased as J shape by the number of previous morbidity and fetal deaths. More than two previous morbidity and fetal deaths resulted in highest risk in both urban and rural (Table 6). The trends are increasing [urban  $\chi^2 =143.91$  rural  $\chi^2=160.43$ ] (Table-6). The trend obtained is significant.

### CONCLUSION

1. The principal factors influencing the outcome of pregnancy may fall into three categories, biological nature including that of genes and the maternal reproductive system, obstetrical factors pertaining to labor and the birth process and external environmental factors.
2. In this larger systematic and intensive study, the scope was on several aspects of human reproduction specially events of several aspects of human reproduction especially events of pregnancies and its outcome observed and very highly reliable and accurate information on morbidity and fetal deaths and gestational age were obtained through careful observations.
3. One of the significant features of the study was to determine the pregnancy soon after the women has missed the normal menstruation period through five weekly visits. The menstrual data of every eligible woman were obtained by direct interview with the women.
4. Univariate statistics calculated for few maternal variables described the extent of fetal losses among categories of study variables. Bivariate analysis carried out in this study between the types of morbidity and fetal deaths and its associated variables for each of the type of morbidity and fetal deaths namely early, intermediate and late the morbidity and fetal deaths. The trend in each of the types of the morbidity and fetal death were also calculated by considering the live births as controls in each of the variables studied and further tested for significance using chi square test.
5. Among total morbidity and fetal deaths in both the urban and rural areas the proportion of early fetal losses was about 80% and each of intermediate and late morbidity and fetal deaths about 10%.
6. The morbidity and fetal deaths were characterized by higher gravida, higher maternal age and previous morbidity and fetal deaths and lower pregnancy interval as compared to live births and these were especially evident in the early morbidity and fetal deaths.

7. In urban, generally, pregnancy interval, and previous morbidity and fetal deaths, were associated with the type of morbidity and fetal deaths whereas in rural the associations were with gravida, previous morbidity and fetal deaths, pregnancy interval.

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