

# Perinatal Mortality Rate and Associated Risk Factors Among Waynad Population in Tertiary Care Center

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## Abstract

**Context:** The Perinatal Mortality Rate (PMR) gives good indicator of quality of Health care available to mother and new-born. As the PMR varies from one region to another region in Kerala and across the country, there is need to study the prevalence of PMR along with causative factors to know the quality of health care system of that region.

**Aim:** to find out the Perinatal Mortality Rate (PMR) and factors influencing the PMR among Waynad population in tertiary care center for the past three years from 2016 to 2019.

**Settings and Design:** This was retrospective study which was conducted in DMWIMS from 2016 to 2018 after taking Institutional Ethical Committee clearance.

**Methods and Material:** In this study we collected the number deaths of babies between 28 weeks of gestation and 1<sup>st</sup> week after delivery from OBG and pediatrics NICU register and later we calculated the PMR from 2016, 2017, 2018 by using formula. The causes for still birth/IUD and early neonatal deaths were noted and entered in Excel sheet.

**Statistical Analysis Used:** This risk factors were analyzed and the results was depicted in percentages and bar graphs using the SPSS software version 16.

**Results:** In the present study the PMR was 25.17/1000 live births in 2016, 15.93/1000 live births in 2017 and 11.4/1000 live births in 2018 among the deliveries conducted in DMWIMS hospital. The prematurity, respiratory distress syndrome was most common cause of early neonatal death were as low birth weight

with Abruption placenta were the common cause of Still birth/ IUD.

**Conclusions:** This decrease in trend of PMR across the year was due to proper antenatal care, intrapartum care and provision of critical care units like NICU from the trained and experienced staff in both Pediatrics, Obstetrics and Gynaecology Department in this Tertiary care centre in Waynad.

**Keywords:** Health care; Perinatal mortality rate; Quality; Risk factors.

## Introduction

Perinatal period extends from 22<sup>nd</sup> week of gestation ( $\geq 154$  days or weighing  $\geq 500$  gm at birth) to less than 7days of life.<sup>1</sup> As currently defined, the term 'perinatal mortality' includes both late fetal deaths (stillbirths) and early neonatal deaths. The eighth revision of the International classification of diseases (ICD) defined the 'perinatal period' as lasting from the 28<sup>th</sup> week of gestation to seventh day after birth. The Ninth Revision (1975) of ICD added that: (i) Babies chosen for inclusion in perinatal statistics should be those above a minimum birth weight i.e. 1000g at birth. (ii) The gestation period of at least 28 weeks should be used and (iii) body length (crown to heel) of at least 35 cm should be used.<sup>2</sup> The value of perinatal mortality rate is that it gives a good indication of the extent of pregnancy wastage as well as the quality and quantity of health care

available to the mother and newborn. It reflects the results of maternity care more clearly than the neonatal death rate.<sup>2</sup>

According to 2012 survey the perinatal mortality in India is 28 in total, 31 in rural and 17 in urban population for 1000 live births. In Kerala it is 10 in total, 11 in rural and 7 in urban population for 1000 live birth.<sup>2</sup> A number of social and biological factors like low socioeconomic status, high maternal age, low maternal age, high parity, heavy smoking, malnutrition etc. which are known to be associated with PMR which varies from country to country and in between different states. An appreciation of these factors will certainly make the greatest impact on reducing perinatal mortality. The various causes of PMR may be grouped as (a) Antenatal causes, (b) Intra natal causes, (c) postnatal causes and unknown among which the main causes of death are intrauterine and birth asphyxia, low birth weight, birth trauma and intrauterine or neonatal infections which may vary from region to region. There are no much studies related to PMR in the Wayanad Region.

So, aim of the present study is to find out Perinatal mortality rate (PMR) and factors influencing the PMR among Wayanad population in tertiary care center.

### Objectives of the study

- 1 To study the PMR among Wayanad population for the past 3 years in the tertiary care hospital.

2. To study the risk factors associated with PMR of Wayanad population visiting the tertiary care center for the past 3 years duration.

### Materials and Methods

This study was conducted in the Department of Anatomy, DM-WIMS, Wayanad. It was a retrospective observational study for a period of three years from 2016 to 2018. In this study we collected the number deaths of babies between 28 weeks of gestation and 1<sup>st</sup> week after delivery from OBG and pediatrics NICU register and later we calculated the PMR from 2016, 2017, 2018 by using formula.

Perinatal mortality rate = Late foetal deaths (28 weeks + of gestation) + postnatal deaths (first week) in a year × 1000 / Live births in a year.

Then the causes and risk factors influencing of perinatal mortality in antenatal, natal and postnatal period was documented from the OBG and NICU records after taking IRB and IEC clearance from the institution. This risk factors were analyzed and the results was depicted in percentages and bar graphs using the SPSS software.

### Results

Table 1 Showing the late foetal deaths (≥28 weeks of gestation) in three years from 2016 to 2018 among Wayanad population in tertiary care center.

**Table 1:** Showing the late foetal deaths (≥28 weeks of gestation) in three years from 2016 to 2018 among Wayanad population in tertiary care center.

Month/Year	2016	2017	2018
Jan	1	5	0
Feb	1	4	0
Mar	1	3	0
Apr	1	0	0
May	1	0	0
Jun	0	1	2
Jul	1	0	0
Aug	0	0	1
Sep	1	2	0
Oct	0	0	0
Nov	1	0	0
Dec	2	0	0
<b>Total</b>	10	15	3

Table 2 Showing postnatal deaths (first week) in three years from 2016 to 2018 among Wayanad population in tertiary care center.

Table 3 Showing live births in three years from 2016 to 2018 among Wayanad population in tertiary care center.

**Table 2:** Showing postnatal deaths (first week) in three years from 2016 to 2018 among Waynad population in tertiary care center

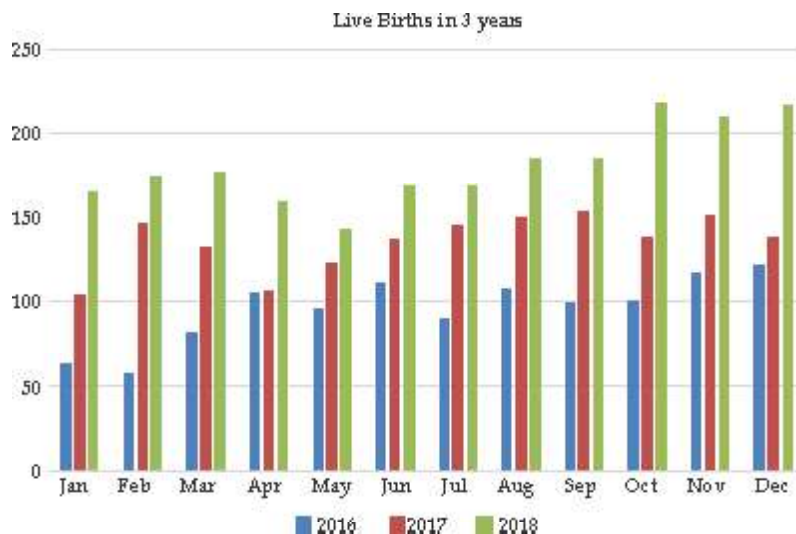
Month/Year	2016	2017	2018
Jan	2	1	3
Feb	1	1	2
Mar	2	3	1
Apr	0	1	2
May	1	0	2
Jun	6	0	4
Jul	2	1	1
Aug	0	0	1
Sep	2	2	2
Oct	0	0	2
Nov	2	1	0
Dec	1	1	2
<b>Total</b>	<b>19</b>	<b>11</b>	<b>22</b>

**Table 3:** Showing live births in three years from 2016 to 2018 among Waynad population in tertiary care center

Month/Year	2016	2017	2018
Jan	64	105	166
Feb	58	147	174
Mar	81	133	177
Apr	106	107	160
May	96	123	144
Jun	111	137	170
Jul	90	146	170
Aug	108	150	185
Sep	99	154	185
Oct	100	139	219
Nov	117	152	210
Dec	122	139	217
<b>Total</b>	<b>1152</b>	<b>1632</b>	<b>2177</b>

Fig 1 Showing live births in three years from 2016 to 2018 among Waynad population in tertiary care center.

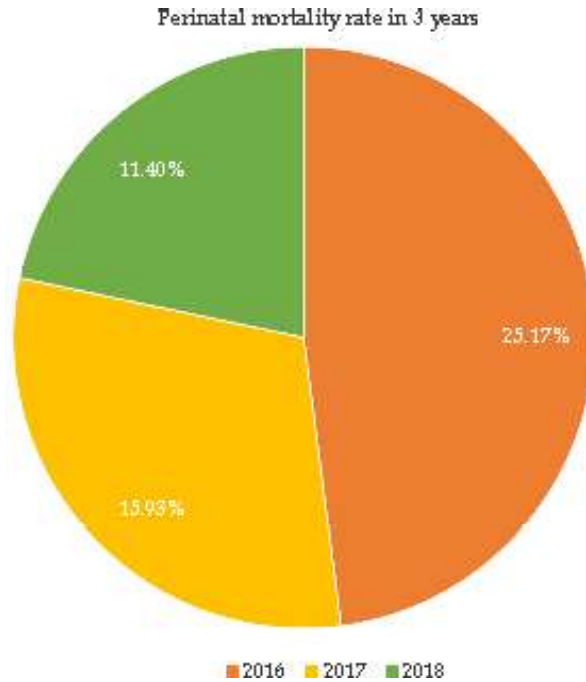
Table 4 Showing the incidence of perinatal mortality from 2016 to 2018 among Waynad population in tertiary care center.



**Fig. 1:** Showing live births in three years from 2016 to 2018 among Waynad population in tertiary care center

**Table 4:** Showing the incidence of perinatal mortality from 2016 to 2018 among Waynad population in tertiary care center

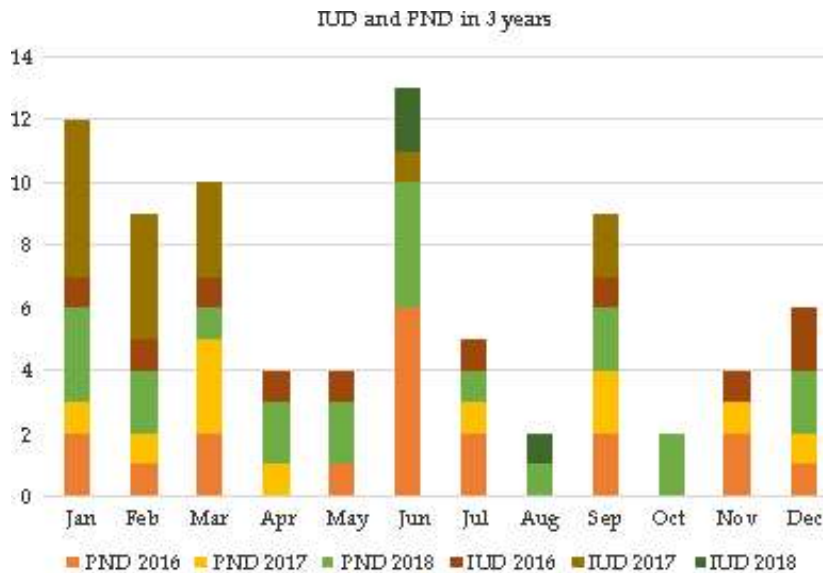
Sl. No	Year	Perinatal mortality rate
1.	2016	25.17%
2.	2017	15.93%
3.	2018	11.4%



**Fig. 2:** Showing the incidence of perinatal mortality from 2016 to 2018 among Waynad population in tertiary care center

Fig. 2 Showing the incidence of perinatal mortality from 2016 to 2018 among Waynad population in tertiary care center.

Fig. 3 Showing the postnatal death and intrauterine deaths in three years from 2016 to 2018 among Waynad Population in tertiary care center.



**Fig. 3:** Showing the postnatal death and intrauterine deaths in three years from 2016 to 2018 among Waynad Population in tertiary care center

Table 5 Showing the different causes for still births from 2016 to 2018.

Table 6 Showing the different causes for early neonatal deaths from 2016 to 2018.

**Table 5:** Showing the different causes for still births from 2016 to 2018

Sl. No	Causes for Still births	Number of cases in year 2016	Number of cases in year 2017	Number of cases in year 2018
1	Abruptio placenta	5	1	0
2	Low birth weight less than 2 kg	4	7	3
3	Preterm	2	3	2
4	PIH	1	0	0
5	Meconium aspiration	0	0	1
6	Breech presentation	2	1	1
7	Hand prolapse	1	0	0
8	Transverse lie	0	1	0
9	Total number of IUD	10	15	3

**Table 6:** Showing the different causes for early neonatal deaths from 2016 to 2018

Sl. No	Causes for Early neonatal deaths	Number of cases in year 2016	Number of cases in year 2017	Number of cases in year 2018
1	Birth Asphyxia	3	0	5
2	Perinatal Asphyxia	0	0	2
3	Respiratory distress	6	2	6
4	HMD	2	0	0
5	Sepsis-MODS	2	1	2
6	Hypoxic ischemic Encephalopathy-3	3	2	0
7	CHD/CCHD	1	4	0
8	MAS	1	0	1
9	DIC	0	1	2
10	Perinatal Depression	0	2	0
11	ELBW	1	1	1
12	Pneumothorax	1	1	1
13	Congenital anomaly	1	0	2
14	Hypoglycemia	0	0	1
15	Neonatal Seizures	0	0	0
16	CLCP	1	0	0
	<b>Total</b>	<b>22</b>	<b>14</b>	<b>23</b>
1	Preterm	14	6	13
2	Term	5	5	9
	<b>Total</b>	<b>19</b>	<b>11</b>	<b>22</b>

## Discussion

In 2014 as per SRS data estimated National Perinatal mortality rate (PMR) was 28 per 1000 live births with still birth of 5 per 1000 live births and Early Neonatal death of 23 per 1000 live births. There was marked interstate variability in PMR minimum was in Kerala that is 10/1000 and maximum of 37/1000 live birth in Odisha.<sup>3</sup>

According to Brahmanandan M et al. whose study in 2017 showed perinatal mortality rate was

29.12 per 1000 live births among patient delivered in SAT Hospital, Thiruvananthapuram, Kerala.<sup>4</sup>

In the present study the PMR was 25.17 per 1000 live birth which was little higher than the state average in that year, whereas the next year 2017 it showed 15.93 per 1000 live birth which was less when compared to the study by Brahmanandan M et al, this may be due to number of High risk deliveries were more in the SAT Hospital in that year and delay in the patient reaching to the Hospital.<sup>4</sup> In the year 2018 the PMR was 11.4 per

1000 live births which was less when compared to previous years due to better Antenatal care, intrapartum care and neonatal care in the hospital. There was also increase in the number of delivery cases and live births from 1152 to 2177 from 2016 to 2018 this is due to conduction of health awareness camps about Antenatal care for pregnant ladies among the Wayanad population, better OBG and pediatric specialty care services in the Hospital and also free conduction of labor for Tribal population.

According to Brahamandan M et al. study the major causes for PMR was prematurity which was 79 in number among 24,796 live births then comes other causes like birth asphyxia 40, prematurity-21, Sepsis-18, congenital anomalies, Meconium aspiration-25, placental insufficiency-15, term birth asphyxia-15, Abruptio placenta-8 and cord complication-6.<sup>4</sup>

In the present study the most common cause for the Still birth was Abruptio placenta, low birth weight along with prematurity. The common early neonatal death causes was prematurity which constituted 73% deaths in 2016, 54.54% in 2017 and 59% in 2018 which was almost similar to Brahamandan M et al. study. According to Lucy D et al. study in Orissa prematurity accounted for 42.5% PMR and another study by Ravi Kumar et al. showed 48.4% were pre-terms among the still birth.<sup>5,6</sup> This decrease in trend of prematurity across the years being the cause of still birth in the present study shows that there was increase in awareness of people for proper health checkup due to health awareness program conducted by the Hospital and also good care given by pediatrician in NICU.

Other causes for early neonatal deaths in 2016 was Respiratory distress in 6 cases, birth asphyxia in 3 cases and Hypoxic ischemic Encephalopathy in 3 cases. In 2017 the early neonatal deaths were due to congenital heart disease-4 cases, Hypoxic Ischaemic Encephalopathy Type 3-2 cases and respiratory distress-2 cases. In 2018 the causes for early neonatal deaths was due to Respiratory distress-6 cases, birth asphyxia-5 cases and perinatal asphyxia-2 cases. The causes for PMR was varying across different years as per this study this may be due to various factors such as genetic, delay in coming to hospital, low socio economic status, etc.

## Conclusion

The present study conducted in Tertiary care hospital showed decrease in the trends of Perinatal

mortality rate from 25.17/1000 to 11.4/1000 live birth across the year from 2016 to 2018. The most common cause being prematurity, Respiratory distress syndrome, abruption placenta giving rise to placental insufficiency. The decrease in trend suggests that there is increased awareness, proper facilities for ANC for all population including free treatment for tribal population, availability trained specialist in Department of Obstetrics and gynecology, pediatrics with proper NICU facilities which could have been the reason for decrease in trend of IUD, still births and neonatal deaths among Waynad population in this tertiary care center.

**Conflict of Interest:** Nil

## Key Messages:

In the present study the PMR decreased from 25.17/1000 to 11.4/1000 respectively from 2016 to 2018 which shows that quality of care provided by this tertiary care centre was good for Waynad Population due to trained staff and conduction of awareness camps.

## Abbreviations

PMR-Perinatal Mortality Rate
PND-Postnatal deaths
IUD-Intrauterine deaths
HMD-Hyaline membrane disease
MODS- Multiple organ disfunction
CHD/CCHD- Congenital Heart Disease
MAS- Meconium Aspiration Syndrome
DIC- Disseminated Intravascular coagulation
ELBW- Extremely Low Birth Weight
CLCP- Cleft Lip Cleft Palate
ANC- Antenatal care
NICU- Neonatal Intensive care unit

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