

## Neonatal mortality rates at Al-Sadar city 2015 – 2019

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**Abstract.** Neonatal mortality is an index for newborn care and maternal health care. It is a useful indicator for obstetrical and neonatal healthcare services quality and availability. It is influenced by environmental, economic and social factors. Therefore, it is a measure of socio-economic status and health system. The study was a cross sectional one. It was conducted at Al Resafa side in Baghdad city. The requested data were reviewed from medical records (sex, cause of death, etc.). Chi-square was used to show the impact of dependent variables (death causes) on the independent variables (sex, and type of neonatal death). P value < 0.05 was considered statistically significant. The results showed number of neonatal deaths per 1000 livebirths ranged from 19.30-19.08 per 1000 livebirths between 2015 – 2019 respectively. Males had the highest neonatal deaths through studied years (54.8%, 54.5%, 56.4%, 57.2%, and 59 respectively). Prematurity (487, 32.1%), and respiratory distress syndrome (387, 25.5%) were significantly the common causes of early neonatal deaths. Sepsis (216, 30.1%), and respiratory distress syndrome (149, 20.8%) were significantly the main late neonatal deaths causes ( $\chi^2= 429.582$ , p value = 0.001). Both males and females mainly died from prematurity (340, 285; 27%, 29.2% respectively). The distribution of causes of neonatal death were significantly varied between sexes ( $\chi^2= 20.782$ , p value= 0.001). In conclusions, neonatal mortality rate is high in the studied period. Two thirds of neonatal death occurred early.

Key words: Neonatal mortality rate, neonates.

**Introduction:**

Neonatal mortality represents the first 28 days of life and is considered the most vulnerable period for a child's survival<sup>[1]</sup>. Neonatal mortality rate is the number of neonatal deaths in a given year per 1000 live births in that year. It can be divided into early and late neonatal deaths<sup>[2]</sup>. Unfortunately, two thirds of infant deaths took place at the neonatal period<sup>[3,4]</sup>. The highest proportion of neonatal deaths occurred within the first 7 days of life (early neonatal death)<sup>[5,6]</sup>.

Neonatal mortality is an index for newborn care and maternal health care<sup>[7]</sup>. It is a useful indicator for obstetrical and neonatal healthcare services quality and availability. It is influenced by environmental, social and economic factors. Therefore, it is a measure of socio-economic status and health system of the country<sup>[2,8]</sup>.

Iraq has been exposed to many man-made crises in the last 40 years that led to the deterioration of the health system which in turn has increased the neonatal mortality rate<sup>[9,10]</sup>. So, the main aim of the study is to show the impact of change in regimen on the trend of neonatal mortality rate 2015-2019.

**Materials and methods:**

This study was a cross-sectional study, conducted at Al Resafa side in Baghdad city. All neonatal death records in Fatima AL-Zahraa Hospital were reviewed. The requested data were obtained from medical records (sex, cause of death, etc.). Chi-square was used to show the impact of dependent variables (death causes) on independent variables (sex, and type of neonatal death). P value < 0.05 was considered statistically significant.

**Results:**

Number of neonatal deaths per 1000 livebirths ranged from 19.30-19.08 per 1000 livebirths between 2015 – 2019 respectively. Figure 1 demonstrates the time distribution of early, late and total neonatal mortality rate per 1000 livebirths.

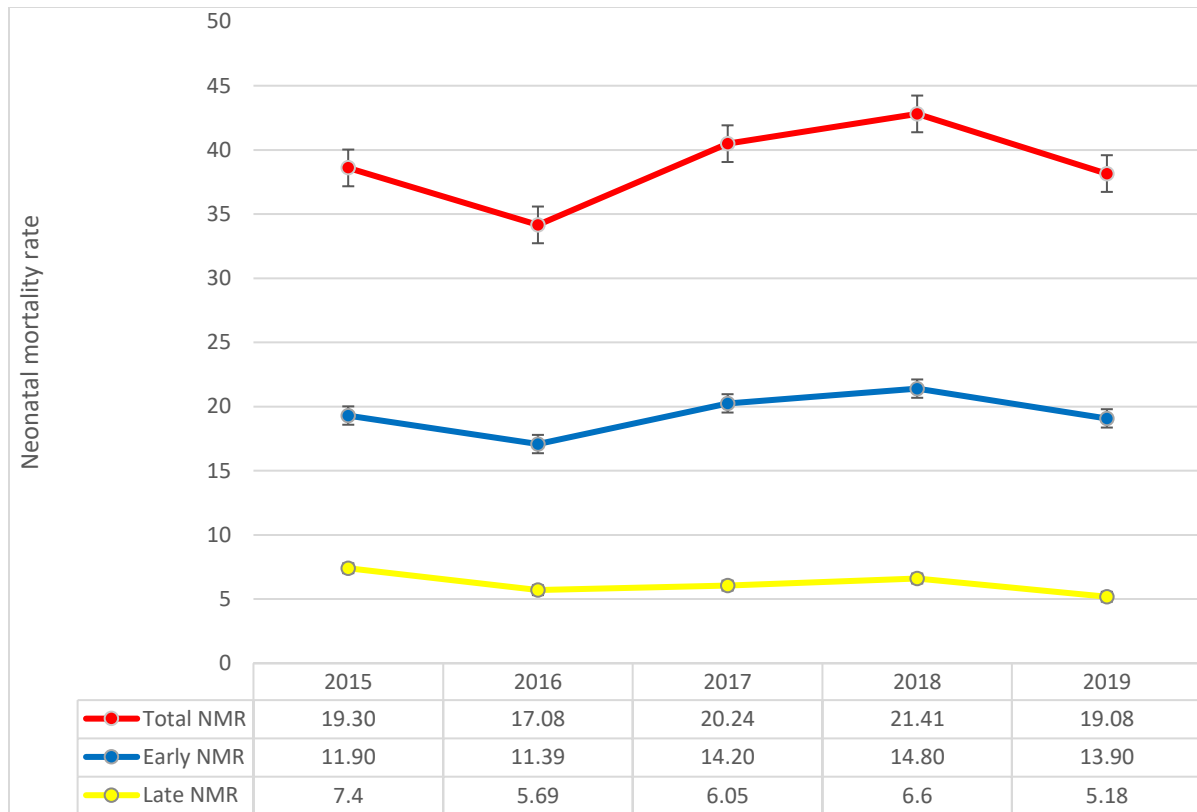


Figure 1. Time distribution of neonatal mortality rate per 1000 livebirth

Males were the highest neonatal deaths through studied years (54.8%, 54.5%, 56.4%, 57.2%, and 59 respectively). Figure 2 below shows the distribution of neonatal deaths by sex.

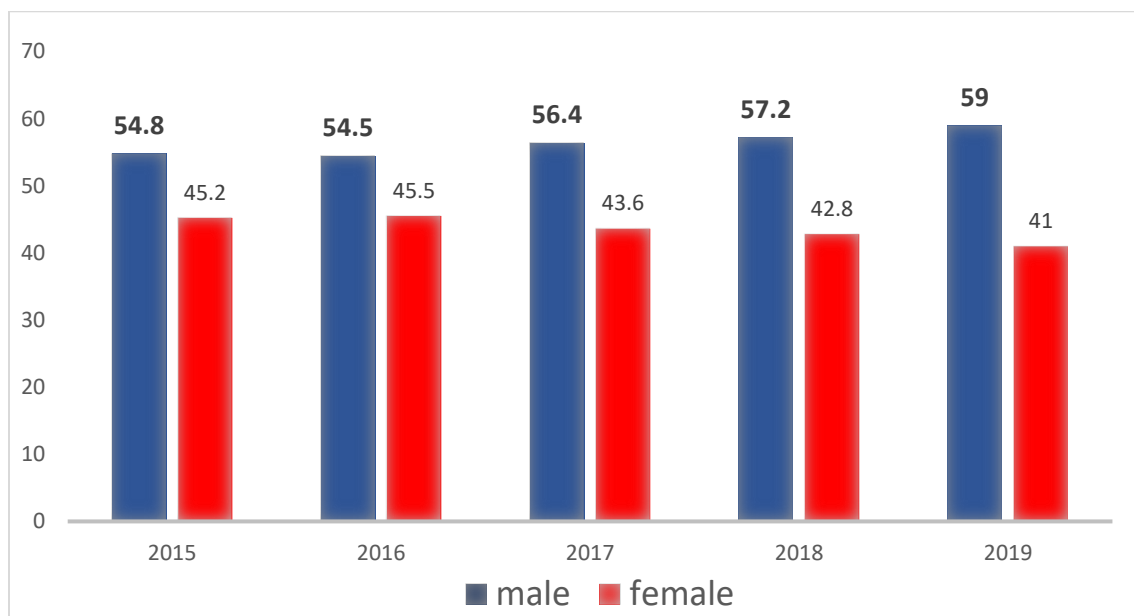


Figure 2. Neonatal deaths distribution by sex

Prematurity (487, 32.1%), respiratory distress syndrome (387, 25.5%), and congenital anomalies (344, 22.6%) were significantly the common causes of early neonatal deaths. Sepsis (216, 30.1%), respiratory distress syndrome (149, 20.8%), and prematurity (138; 19.2%) were significantly the main late neonatal deaths causes ( $\chi^2= 429.582$ , p value = 0.001). Both males and females mainly died from prematurity (340, 285; 27%, 29.2% respectively). The distribution of causes of neonatal death were significantly varied between sexes ( $\chi^2= 20.782$ , p value= 0.001). Table 1 demonstrates the causes of neonatal death.

Table 1: Causes of neonatal death:

		Cause of death					
		RDS	Congenital anomalies	Premature	Birth asphyxia	Sepsis	Others
Neonatal death	early	387(25.5%)	344(22.6%)	487(32.1%)	258(17%)	40(2.6%)	3(0.2%)
	Late	149(20.8%)	99(13.8%)	138(19.2%)	87(12.1%)	216(30.1%)	28(3.9%)
$\chi^2= 429.582$		d.f. =5		p value = 0.001			
Sex	Male	320(25.4%)	215(17.1%)	340(27%)	215(17.1%)	150(11.9%)	20(1.6%)
	Female	216(22.1%)	228(23.4%)	285(29.2%)	130(13.3%)	106(10.9%)	11(1.1%)
$\chi^2= 20.782$		d.f.=5		p value= 0.001			

Discussion:

Reduction of neonatal mortality rate requires adequate knowledge of the real factors at each health care level so that maternal and human resources are efficiently channeled to this constraint. Neonatal deaths are not just mere incidence, since they indicate failures of the political powers, professionals of the health system and families <sup>[11]</sup>.

Iraqi neonatal mortality rate fell gradually from 23.6 deaths per 1000 live births in 2000 to 15.3 deaths per 1000 live births in 2019 <sup>[12, 13]</sup>. This fall in NMR can be explained by wealth redistribution. It was documented that wealth redistribution enhanced children health (e.g., malnutrition) <sup>[14]</sup>. Peace was the promotor for enhancing health <sup>[15]</sup>.

The neonatal mortality rate was 19.30-19.08 per 1000 livebirths between 2015 – 2019 respectively. The peak neonatal mortality was in 2018. This might be explained by the fact that Iraqi health system was badly eroded due to wars. After change in regimen in 2003, Iraq faced conflicts, and civil wars that kept health

system eroded. No attempts were taken place to reform health system <sup>[16]</sup>. The reported rate is higher than the average global neonatal mortality rate in 2019 <sup>[12]</sup> and other literatures <sup>[17 - 19]</sup>. However, the rate was lower than Southwest Ethiopia <sup>[20]</sup>, and India <sup>[21, 22]</sup> which might be due to the difference in socioeconomic status.

The main causes of neonatal deaths were prematurity, respiratory distress syndrome and Congenital anomalies. This finding is similar to that in literatures <sup>[23, 24]</sup>. Prematurity has been the global leading cause of neonatal mortality for at least a decade but has now also become the leading cause of childhood mortality at five years age <sup>[25]</sup>.

Two thirds of neonatal deaths occurred early. It might be suggesting a poor healthcare provided in the early postpartum period and reflect the problem of the whole care (antenatal, natal and postnatal care). It might also reflect a defect in health system. It had been reported that early neonatal death increased due to high frequency of prematurity. The study revealed that 28.0% of neonatal deaths were due to prematurity. Prematurity might be related to lower adequacy and accessibility of maternal and perinatal health care <sup>[26]</sup>. This finding is similar to that reported in Baghdad previously <sup>[23, 27]</sup>, and Egypt <sup>[28]</sup>.

The main cause of late neonatal death was sepsis which may be caused by vertically (during labor form birth canal) or horizontally (nosocomial) acquired pathogens <sup>[29]</sup>. Neonatal deaths due to infections are preventable by maternal screening and treatment <sup>[30]</sup>.

In the line with that reported in literature <sup>[31, 32]</sup> the study showed a significant association of gender with neonatal mortality. Male neonates have an excessive risk of death. It has never been clear whether this male disadvantage is due to specific disease processes or a general biologic feature of being male <sup>[33]</sup>. It might be also due to the nature that male neonates are at more prone to different complications as stated in many studies <sup>[34-36]</sup>.

#### Conclusions:

Neonatal mortality rate was high in the studied period. Two thirds of neonatal death occurred early.

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