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Perinatal mortality profile in municipalities of Piauí's Coastal Plain

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ABSTRACT. Among the elements that impact Infant Mortality, Perinatal Mortality stands out, which involves deaths that occur during the period that begins at 22 completed weeks (or 154 days) of gestation (fetal period) and ends at 7 completed days after birth, that is, from 0 to 6 days of life (early neonatal period). The objective of this research is to describe the profile of perinatal deaths reported in municipalities of Piauí's Coastal Plain from 2013 to 2017. This is a retrospective, descriptive study with a quantitative analysis approach, resulting from the Course Completion Work entitled 'Perinatal mortality profile in municipalities of Piaui's Coastal Plain'. The sample consisted of death certificates and infant death and fetal death investigation forms of children whose mothers lived in the Coastal Plain, PI, and who had their deaths confirmed in the perinatal period, between January 2013 and December 2017. During the study period, the Perinatal Mortality Rate (PMR) of the Coastal Plain, PI, was 22.97 deaths per 1,000 births, with little variation between 2013 and 2017. Fetal deaths were predominant, comprising 61.9% of the sample. Hospital deaths that occurred in Parnaíba were the most frequent, revealing this to be the reference municipality in the region. This shows the need for greater attention on the part of health professionals and managers to such conditions, in order to improve the quality of care for pregnant women, parturient women, and newborns.

Keywords: fetal death; early neonatal mortality; morbimortality indicators; epidemiology.

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Introduction

The perinatal period begins at 22 completed weeks (or 154 days) of gestation (fetal period) and ends at 7 completed days after birth, that is, from 0 to 6 days of life (early neonatal period) (Organização Mundial da Saúde [OMS]. Organização Pan-Americana da Saúde [OPAS], 2021). In general, deaths occurring in this period reveal the existence of adverse factors related to prenatal care, childbirth and the newborn, as well as to access conditions and the quality of the health service provided to the population. The Perinatal Mortality Rate (PMR) (Brasil, 2016) is calculated by summing the number of fetal deaths and early neonatal deaths, and dividing it by the number of total births (sum of live births and fetal deaths) from mothers residing in a given geographic space.

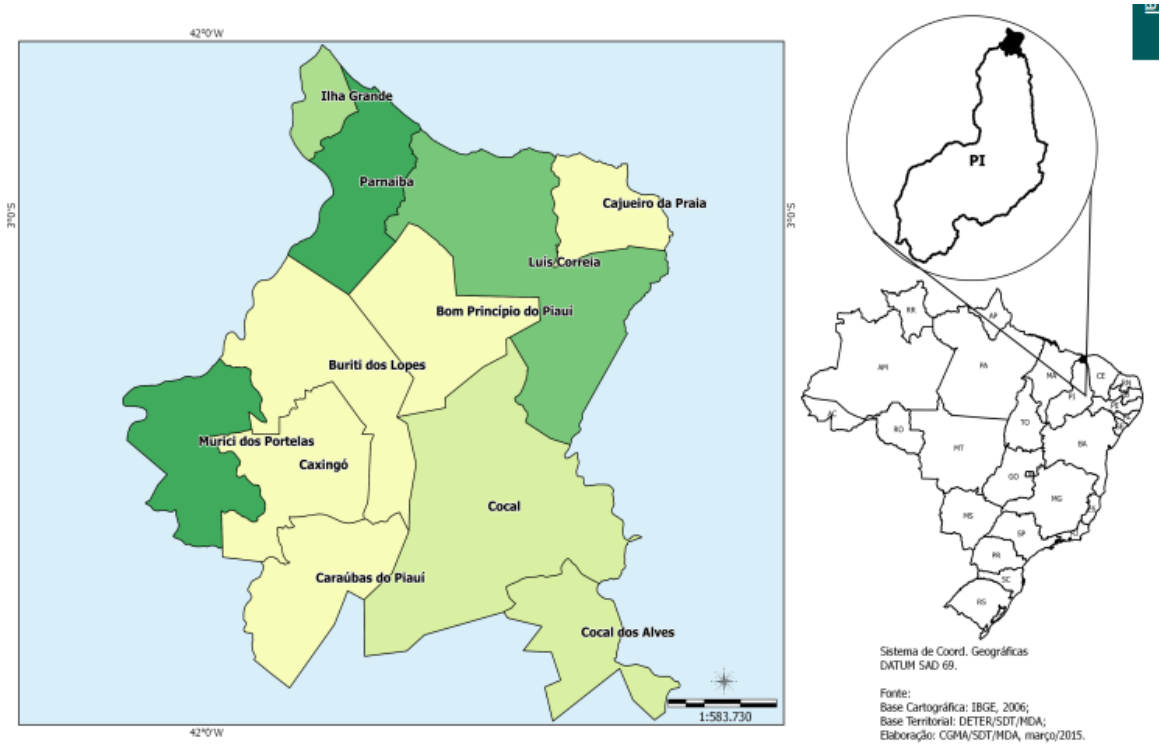
This rate is of great relevance for public health, since it is influenced by biological factors of both the mother and the newborn, by socioeconomic and cultural differences, in addition to cases of underreporting of data related to fetal and neonatal deaths, which are quite frequent in the country, mainly in its less developed areas (Rodrigues et al., 2016; Heráclio et al., 2018). In addition, perinatal mortality in Brazil has shown little variation over the years, presenting great heterogeneity among Brazilian states. It is necessary to deepen the understanding of this problem by conducting new studies that address the issue in different states, since perinatal deaths are largely preventable and have their determinants modifiable by means of effective public policies (Lansky, Friche, & Silva, 2014).

Reflecting on this fact, and considering that there is a lack of recent studies on the indicator in the state of Piauí, the researcher took an interest in delimiting the study area to the extreme north of the state, in the 1st Health Region, called Coastal Plain, with the aim of describing the perinatal mortality profile in this territory. The research provided an epidemiological update on perinatal deaths in the Coastal Plain (PI). The objective of this study was to report the spatial and temporal distribution of perinatal deaths in the

municipalities of the Coastal Plain, PI, from 2013 to 2017, as well as to characterize the municipality of occurrence and the environment in which they occurred.

Material and methods

This is a retrospective, descriptive study with a quantitative analysis approach, resulting from the Course Completion Work entitled 'Perinatal mortality profile in municipalities of Piauí's Coastal Plain'. The target territory of the study is the 1st Health Region of Piauí, called Coastal Plain, located in the extreme north of the state, comprising 11 municipalities, as illustrated in the figure below. This region covers an area of 6,193.7 km^2, with an estimated population of 275,604 inhabitants in 2017 (Instituto Brasileiro de Geografia e Estatística [IBGE], 2013).



Source: Brasil (2015, p. 1).

Death certificates (DCs) and infant death and fetal death investigation forms were analyzed; they referred to children who had their deaths confirmed in the fetal period or in the early neonatal period, whose mothers lived in the Coastal Plain (PI), from January 2013 to December 2017. Fetal death was considered to be a stillbirth at 22 or more weeks of gestation, and early neonatal death was considered to be infant death from zero to six completed days of life. The exclusion criteria were infant deaths involving mothers who did not reside in the Coastal Plain (PI) and babies whose death was not classified as fetal or as early neonatal, and those that were outside the temporal unit of the research.

The collection of the data necessary to carry out the research took place in the Health Region-Parnaíba and in the Health Surveillance of Parnaíba, during the months of June to November 2018. The death investigation forms analyzed were those that were filed at the data collection sites, which had been filled out with information provided by family members, caregivers and health professionals who interacted with the mother (in the case of fetal death) or with the deceased child (in the case of early neonatal death) during the illness or event leading to death.

The DCs were filtered through the Mortality Information System [*Sistema de Informações Sobre Mortalidade*] (SIM), and the veracity of the information contained therein was analyzed through available death investigation forms. Data collected from the DCs and investigation forms were analyzed with a view to verifying the situation of perinatal deaths in the territory. Fetal mortality, early neonatal mortality, and perinatal mortality indicators were calculated; as recommended by the Infant and Fetal Death Manual (Brasil, 2009), fetal deaths with gestational age unknown or not informed were included in the Fetal and Perinatal

Mortality Rates. Secondary data made available online by the Live Birth Information System (*Sistema de Informações sobre Nascidos Vivos*) (Piauí, 2021) were used to access the number of live births. The results obtained were processed through statistics and presented through graphs and tables, which were analyzed using current scientific literature relevant to the topic.

The research project obtained the consent of Parnaíba's Health Region and the Health Surveillance of Parnaíba's Municipal Health Department. It was also approved by the Research Ethics Committee of the State University of Piauí (*Universidade Estadual do Piauí*) (CEP UESPI), under substantiated opinion No. 3.006.525/2018, Presentation Certificate for Ethical Appraisal (*Certificado de Apresentação para Apreciação Ética*) (CAAE) No. 97900018.0.0000.5209.

Results and discussion

The DCs of 483 perinatal deaths involving mothers residing in Piauí's Coastal Plain, from 2013 to 2017, were analyzed, with 299 fetal deaths and 184 early neonatal deaths. A total of 194 (40.16%) fetal or infant death investigation forms were accessed.

Analyzing the Perinatal Mortality Rate (PMR) for the five-year period (2013 to 2017), it was observed that the PMR of the Coastal Plain was 22.97 deaths per 1,000 births. Among the municipalities, Luís Correia had the highest rate in the period (27.27/1,000), followed by Cocal (25.26/1,000), Bom Princípio do Piauí (24.01/1,000) and Parnaíba (23.31/1,000). The lowest rates were found in Cocal dos Alves, which had the lowest (14.74/1,000), Buriti dos Lopes (18.00/1,000), and Caxingó (18.3/1,000) (Table 1).

Table 1. Total live births, fetal deaths, early neonatal deaths, perinatal deaths and respective Perinatal Mortality Rates, by municipality, Coastal Plain, PI, in the 2013-2017 five-year period.

Municipality	Live births (n)	Fetal deaths (n)	Early neonatal deaths (n)	Perinatal deaths (n)	PMR/ 1,000 births
Bom Princípio do Piauí	451	7	4	11	24.01
Buriti dos Lopes	1589	22	7	29	18
Cajueiro da Praia	520	9	2	11	20.79
Caraúbas do Piauí	368	5	2	7	18.76
Caxingó	433	4	4	8	18.3
Cocal	1872	28	20	48	25.26
Cocal dos Alves	337	2	3	5	14.74
Ilha Grande	739	13	4	17	22.6
Luís Correia	2163	37	23	60	27,27
Murici dos Portelas	539	7	3	10	18.31
Parnaíba	11716	165	112	277	23,31
Coastal Plain	20727	299	184	483	22.97

It is also observed that perinatal mortality was not evenly distributed in the Coastal Plain, being higher in larger cities. On the other hand, the smaller municipalities and those further away from Parnaíba had lower PMRs. However, one must consider the frequent underreporting of perinatal deaths in less developed cities; there is evidence that the poorer the municipalities, the more flaws their registration systems have (Faria & Santana, 2016). This is because such locations have a large portion of the population living in rural areas, creating health care gaps and hampering the flow of communication between information systems (Moreira et al., 2017).

In Piauí's Coastal Plain, this rate decreased from 24.65/1,000 births in 2013 to 22.69/1,000 births in 2017, representing a reduction of approximately 8%. The early neonatal component was the main responsible for this oscillation, with the Early Neonatal Mortality Rate (ENMR) going from 9.66 to 7.6/1,000 births between 2013 and 2017, representing a 21.32% reduction in early neonate deaths. In contrast, the fetal component had a natural oscillation of 0.46%, in which the Fetal Mortality Rate (FMR) increased from 15.13 to 15.2/1,000 births. During these years, the lowest PMR was found in 2014 (20.69/1,000 births), and the highest, in 2013 (24.65/1,000 LB) (Figure 1).

Though with fluctuations, a decrease in PMR was observed during the 5 years covered in this study; however, such variation is statistically insignificant, tending towards stability in this indicator. This is due to the fact that, while the ENMR regressed, the PMR rose during the period. This is also related to differences between the PMRs in the municipalities that make up the Coastal Plain; simultaneously with the regression of this indicator in municipalities such as Caraúbas (76.59% reduction) and Cajueiro da Praia (59.38% reduction), the municipalities

of Cocal dos Alves, Caxingó and Murici dos Portelas saw a significant increase, since in 2013 no perinatal death had been recorded in these locations, revealing inequalities between the Plain's geographic regions and regarding the recording of this information among the different municipalities that comprise it.

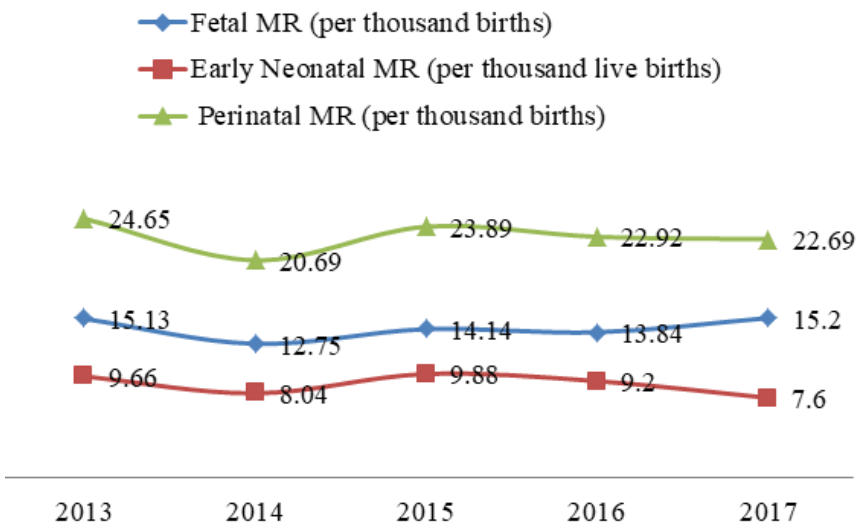


Figure 1. Evolution of the perinatal mortality rate and its components in the Coastal Plain Health Region, PI, from 2013 to 2017.

The indicators of perinatal mortality in the Coastal Plain are high compared to those found by Rêgo, Vilela, Oliveira and Bonfim (2018) in Recife (PE), in the period between 2010 and 2014. In their research, the city's perinatal mortality rate was 15.3 per thousand births, with a risk of fetal death of 8.6 deaths per thousand births, and a risk of early neonatal death of 6.5 deaths per thousand live births. There was an increase in fetal deaths (12.1%), but, just as in the Coastal Plain, there was a reduction in early neonatal deaths (15.8%) in the study period.

According to Figure 2, fetal deaths were the most predominant in all municipalities, reaching 81.8% of the total in Cajueiro da Praia, and 76.4% in Ilha Grande. The exceptions were the municipality of Cocal do Alves, where early neonatal deaths accounted for 60% of the total, and Caxingó, where they corresponded to 50%. Altogether, in the Coastal Plain, fetal deaths accounted for 61.90% of the total, and early neonatal deaths, for 38.09%.

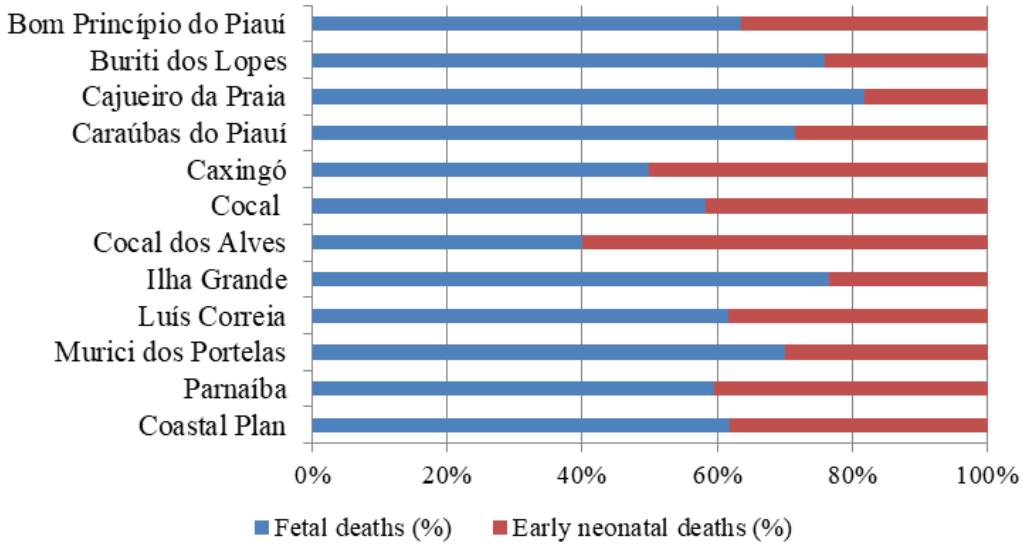


Figure 2. Relative distribution (%) of the fetal and early neonatal components of perinatal mortality in the municipalities that make up the Coastal Plain, PI, 2013-2017.

A similar result was found by Pereira et al. (2016) in a study conducted in Pernambuco, in which 57% of deaths corresponded to the fetal component. The city of Salvador (BA) also had the highest proportion of deaths occurring before delivery (59%) (Nascimento, Costa, Braga, & Natividade, 2017). In Caxias (MA), from 2011 to 2013, neonatal deaths were the most prevalent, with the fetal component corresponding to 44.54% of deaths (Gomes, Carvalho Filha, & Portela, 2017).

Factors such as distortions in the concept of fetal death, high rates of underreporting, and neglect as to the magnitude of this problem are related to the predominance of fetal deaths. In this sense, it is important to emphasize that the Infant and Fetal Death Surveillance Manual considers stillbirth (or stillborn) as synonymous with fetal death. The same document brings the concept of live birth as the product of the conception that, regardless of gestational age, after separation from the maternal body, breathes or shows any sign of life (Brasil, 2009).

In connection with this information, it must be considered that the high number of fetal deaths may be influenced by the misunderstanding of the concept of fetal death on the part of some health professionals, especially when it comes to premature children; though with signs of life in the first minutes, they are considered unfeasible, and it is likely that they are not recorded as early neonatal deaths, but as stillbirths. It is known that data related to stillbirths have greater deficiencies and incompleteness in relation to early neonate deaths, presenting worse quality in the records, which makes it difficult to propose effective measures for their prevention (Heráclio et al., 2018).

In contrast, early neonatal mortality is widely debated, and efforts to reduce it worldwide are frequent, since it is the component that has the most influence on infant mortality and is difficult to control. Despite all the advances in reducing infant mortality, the main responsible for this decrease is the drop in late neonatal deaths, with early neonatal mortality persisting with a high number of deaths (Migoto, Freire, & Barros, 2018).

According to Table 2, the municipality where most perinatal deaths occurred was Parnaíba (92.33%), followed by Teresina (4.14%), both with a predominance of deaths in a hospital environment. This information is understandable because Parnaíba is the city of health care reference for the Coastal Plain, where the health services aimed at the most complex cases in the region are concentrated. Teresina, in its turn, is the reference city for the state of Piauí, including Parnaíba.

Table 2. Distribution of perinatal deaths involving mothers residing in the Coastal Plain, PI, by death occurrence municipality and death occurrence place, from 2013 to 2017.

Municipality of occurrence		Place of occurrence				Total
		Hospital	House	Other	Unknown	
		n	n	n	n	
Parnaíba		430	08	02	06	446
Teresina		20	0	0	0	20
Cocal		02	01	0	01	04
Piracuruca		03	0	0	0	03
Luís Correia		0	01	0	0	01
Luzilândia		01	0	0	0	01
Bom Princípio do Piauí		0	01	0	0	01
Unknown		05	01	0	01	07
Subtotal	n	461	12	02	08	
	%	95.44	2.48	0.41	1.65	

Overall, there were 461 (95.44%) hospital deaths, and 12 (2.48%) home deaths. One death occurred on a public road, and one on the way to the health service. Those with unknown information corresponded to 8 (1.65%). These data are similar to those found in Teresina, PI, between the years 2005 to 2014, where deaths that occurred in a hospital environment were the majority (94.22%), followed by those that occurred in a domestic environment (4.85%) (Araújo Filho, Araújo, Almeida, & Rocha, 2017).

The predominance of deaths in hospital environments in the Coastal Plain reveals that the improvement of perinatal care is not only related to access to clinical service, but that such service is a quality one and provided in a timely manner. This quality refers to good physical structure, equipment, supplies and, above all, to professionals who work in a humanized way, in order to prevent obstetric and neonatal complications, being trained so that, if they occur, they know how to handle such events (Lansky, França, and Lea (2002).

Deaths in the home environment are related to home births or the death of a neonate after hospital discharge. Puerperal home visits should take place in the first week after delivery, the period corresponding to early neonatal death for newborns, as it is during this period that most mortality situations present themselves. However, for this to be a quality visit, investment in Ongoing Health Education is necessary for FHS professionals and managers, so that they direct care towards the factors that put the lives of newborns at risk (Lucena et al., 2018).

With regard to home birth, in itself, it does not represent a risk to maternal and infant health, as long as it is carried out responsibly and with proper assistance. However, this is not the reality of the Coastal Plain: in this region, home births are not planned, occurring accidentally. Thus, it poses greater risks of perinatal mortality compared to deliveries performed in a hospital environment (Migoto et al., 2018).

The distance between the residence and the health service, and the lack of adequate transport are possible reasons for the occurrence of home births in the Coastal Plain. This also contributes to births taking place on the way to the health service or even on public roads. A study by Prado, Fontes, and Schimidt (2015), which aimed to identify factors related to vitality at birth, reveals that the time spent between home and hospital being greater than 60 minutes is a risk factor for neonatal death.

This increases the pregnant woman's pilgrimage to health services to receive care (Lansky et al., 2014), especially in smaller and more distant municipalities. In these municipalities with a large number of rural populations hospital care tends to be of lower quality and rely on fewer professionals, less infrastructure and limited access to specific medicines, oftentimes having to resort to more complex care centers (Victora et al., 2011).

Conclusion

A high Perinatal Mortality Rate was detected in Piauí's Coastal Plain, although there were no significant variations in this indicator during the study period. The fetal component presented a higher proportion of deaths than the early neonatal component did, and there was a predominance of deaths that occurred in a hospital environment, revealing the need to improve delivery and birth care. A limiting factor for this study is the occurrence of underreporting and incomplete information in documentsrelated to perinatal mortality. The importance of this public health problem is highlighted, since it involves social and economic guidelines, in addition to bringing suffering to several Piauí families.

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