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The Robson Classification as an evaluation of the cesarean section rate in the regions of Brazil and the relationship with the infant mortality rate

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ABSTRACT
INTRODUCTION: Most childhood deaths are concentrated in the first year of life, above all in the first month. There is a high participation of perinatal causes such as prematurity, by which highlights the importance of factors related to pregnancy, childbirth, and postpartum, generally preventable with quality assistment healthcare. OBJECTIVE: To analyze the prevalence of cesarean section rates according to Robson's classification in each region of Brazil and relate it with infant mortality rate. METHODOLOGY: This is a quantitative, observational, cross-sectional, and descriptive study. The study involved 7,194,258 Brazilian women aged 20 to 24 years from 2012 to 2021. The study was conducted in Brazil, covering all five regions of the country: North, Northeast, Southeast, South, and Midwest. Data were electronically obtained from the Health Department (DATASUS) of the Brazilian Unified Health System (SUS) using the TABNET application. RESULTS: Our findings suggest that patients aged 20 to 24 years old who fall into group 3 of Robson's classification are the most prevalent in Brazil then the others and They are who have a highest chance of vaginal delivery). Therefore, it can be inferred that there was an option for cesarean section and not a medical indication. Regarding newborns, it is also necessary to note that in the first and second minute of life, the Apgar score with the highest occurrence was 8-10, indicating that most babies were born with good vitality. Furthermore, the most prevalent birth weight was between 3000 and 3999 grams, which, according to the Ministry of Health, indicates the ideal weight for a healthy newborn. Moreover, it is worth noting that despite the highest infant mortality rates occurring onto 0-6 days period, we can infer that something during childbirth may have contributed to this statistic, such as an incorrect indication for cesarean section. CONCLUSION: It is common knowledge that vaginal delivery offers numerous (a several) benefits to the newborn, as in terms of immunity such as for the mother during the postpartum period.

Keywords: Robson classification, Cesarean, Infant Mortality, Indicators of Morbidity and Mortality.

1 INTRODUCTION

"Most childhood deaths are concentrated in the first year of life, especially in the first month. There is a high participation of perinatal causes such as prematurity, which highlights the importance of factors related to pregnancy, childbirth and postpartum, which are generally preventable through quality health care" (LANSKY S, 2014).

It is known that the choice of natural childbirth is extremely important for the health of the newborn, due to factors related to the physiological process from birth to the immunological development provided, among many other benefits (RAYMAN M, 2019). Thus, the percentage of

cesarean sections indicated by the World Health Organization (WHO) is 15%. However, in Brazil, this number grows to 56%, being the world leader in cesarean sections, becoming an "epidemic". In the private network, this margin is increased, reaching the mark of 89% (FIOCRUZ, 2021).

In 20 years, there has been an increase worldwide in cesarean deliveries, on average, in Europe the rate is 20% to 22%, in the United States it rises to 32.8%, but still below the rate in Brazil (UNA-SUS, 2015).

Data from the information system on live births (Sinasc) referring to births in 2016 indicate the Brazilian states with the highest rates of cesarean delivery: Goiás (67%), Espírito Santo (67%), Rondônia (66%), Paraná (63%) and Rio Grande do Sul (63%) (GUEDES, 2018).

This procedure indicates that there is a higher risk of infant mortality in 25% of children up to 5 years of age compared to those born vaginally. However, when cesarean section is recommended by the physician due to risk factors, the death rate decreases (LARANJEIRA, 2021).

The infant mortality rate, or coefficient, is an estimate of the risk of death to which a population of live births is exposed in a given area and period before completing the first year of life (PEREIRA, 1995). Infant mortality can be divided into early neonatal (0-6 days of life), late neonatal (7-27 days) and post-neonatal (28 days or more) (PALHANO, 2017).

The epidemic of cesarean deliveries, largely without indication for medical reasons (therapeutic cesarean section), helps to increase the infant mortality rate, pointing to the need to reassess the cesarean section rate, through the implementation of a standard instrument, proposed by the World Health Organization (WHO), the Robson Classification (LINS, 2021).

The Robson Classification was created by the Irish physician Michael Robson in 2001 with the aim of prospectively identifying clinically relevant groups of women in which there are differences in cesarean section rates and thus allowing comparisons within the same institution over time or between different institutions (WORLD HEALTH ORGANIZATION, 2015).

The Robson Classification uses 10 groups and 6 obstetric concepts, namely: parity, previous cesarean section, onset of labor, gestational age, fetal presentation, and number of fetuses. The classification is totally inclusive and mutually exclusive, i.e., all pregnant women are included in only 1 of the 10 groups (NAKAMURA- PEREIRA M, 2016).

It is essential to portray the usefulness of the Robson Classification: in addition to being simple, robust and reproducible, it is clinically relevant and prospective. The World Health Organization in 2011 concluded, in a systematic review, that it is the most appropriate classification for local and international needs. (FIOCRUZ, 2018)

To the best of our knowledge, there are no articles relating the cesarean section rate based on Robson's classification to neonatal mortality. It is inferred, therefore, that there are several variables that justify the increase of this practice without correct indications in Brazil. Therefore, the objective

of this study is to analyze the prevalence of cesarean section rates according to Robson's classification in each region of Brazil and to relate it to the infant mortality rate.

2 METHODOLOGY

This is a quantitative, observational, cross-sectional and descriptive study. The study involved 7,194,258 Brazilian women aged between 20 and 24 years, since this age group is associated with lower risk during pregnancy. In order to analyze the causes of the incidence of cesarean deliveries in the period from 2012 to 2021, to understand the possible reasons behind the growing preference for the cesarean section method, and to identify the infant mortality rate taking into account the most recent data available, the study was conducted in Brazil, covering the five regions of the country: North, Northeast, Southeast, South and Midwest.

The infant mortality rate was calculated based on the equation: number of deaths of children under 1 year of age in the period divided by the number of live births in the period multiplied by 1,000. This calculation is used internationally to define the indicator of quality of life and development of a given population, it is a very sensitive indicator of social, economic and health inequity (UFSC, 2017).

Data related to variables related to the mother and newborn were obtained electronically from the Health Department (DATASUS) of the Unified Health System (SUS) in Brazil, using the TABNET application, a generic tabulator in the public domain that allows data to be organized according to the requested query to obtain various information within the SUS.

Initially, data collection was carried out on women aged between 20 and 24 years, from the five different regions of Brazil, totaling 7,194,258 participants. Thus, several aspects were evaluated, including schooling, race, Robson classification and the analysis of their respective newborns, including information such as weight, sex, Apgar score in the first and second minute, birth weight and type of delivery.

The second period was used for comparison purposes, in order to verify the characteristics of pregnant women in relation to the characteristics of newborns. The choice of this target audience is due to the intention of analyzing the trend in the behavior of opting for cesarean sections without medical indication and its impact on live births and infant mortality rates in different regions of Brazil.

The data were consolidated in an Excel spreadsheet and, subsequently, were discussed in a descriptive way, analyzing the collected numbers and comparing those with higher and lower prevalence, in order to generate a conclusion about the proposed theme. The present study followed the ethical procedures according to Resolution No. 466/2012 CNS, however, it used public databases (http://datasus.saude.gov.br/).

3 RESULTS

During the study period, 7,194,258 women participated in the Robson classification. The most prevalent education in Brazil was from 8 to 11 years old (69.7%), with the highest rate in the Southeast region being 39.7%. The least prevalent were those with no schooling (0.3%), with a predominance in the North region (42.1%).

Regarding race, the highest percentage of mothers who had children was brown, in the Northeast region 39.1%. On the other hand, those who had fewer children were considered yellow, with the lowest rate in the southern region: 6.7%.

Finally, with regard to Robson's classification, the highest rate of deliveries occurred in nulliparous women, singleton pregnancies, cephalic pregnancies, <37 weeks, and spontaneous labor, totaling 35.2% in the Northeast region. While the lowest percentage was of women who had all abnormal presentations (including previous cesarean section), with the Midwest region having the lowest rate (6.7%).

Table 1 - Identification data of mothers who presented Robson classification in the period from 2012 to 2021. Brazil, 2023.

		North		Northeast		Southeast		South		Midwest		Brazil	
VARIABLE		N	%	n	%	n	%	n	%	n	%	N	
	Mother's Instruction												
No		8708	42,1	7613	37	2198	10,6	814	3,9	1340	6,5	20673	0,3
1 to 3 years		31764	6,6	62763	47,6	21529	16,3	8859	6,7	7027	5,3	131942	1,8
4 to 7 years		199465	16,1	471746	38,0	335680	27,1	150490	12,1	83302	6,7	1240683	17,2
8 to 11 years		576859	11,5	1382816	27,6	1988815	39,7	640593	12,8	425059	8,5	5014142	69,7
12 years and older		71534	10,7	148933	22,2	252641	37,7	109068	16,3	88381	13,2	670557	9,3
Ignored		18205	15,7	57885	49,8	30286	26,1	3938	3,4	5947	5,1	116261	1,6
Total		906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100,0
	Race												
White		63732	3,0	209717	9,7	1049277	48,6	699597	32,4	135422	6,3	2157745	30,0
Black		20811	5,0	107214	25,8	216947	52,3	43775	10,6	26061	6,3	414808	5,8
Yellow		2180	8,6	6901	27,2	10772	42,5	1701	6,7	3778	14,9	25332	0,4
Curtain		769818	18,0	1673920	39,1	1295387	30,3	152964	3,6	388825	9,1	4280914	59,5
Indigenous		35633	53,9	10735	16,2	5114	7,7	4010	6,1	10671	16,1	66163	0,9
Ignored		14361	5,8	123269	49,4	53652	21,5	11715	4,7	46299	18,6	249296	3,5
Total		906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100
	Robson's Classification												
01	Increased chance of vaginal delivery	158361	12,9	433870	35,2	402189	32,7	127051	10,3	109870	8,9	1231341	17,1
02	Increased chance of vaginal delivery	49601	5,3	178192	19,2	456586	49,1	178506	19,2	67149	7,0	930034	12,9

03	Increased chance of vaginal delivery	210365	17,9	411795	35,0	348790	29,6	109411	9,3	96584	8,2	1176945	16,4
04	Increased chance of vaginal delivery	35485	7,8	97115	21,4	212466	46,8	76942	16,9	32097	7,1	454105	6,3
05	Some chance of vaginal delivery	122936	12,7	256008	26,5	353799	36,7	132158	13,7	99996	10,4	964897	13,4
06	Lower chance of vaginal delivery	7749	9,9	21692	27,6	29106	37,0	12484	15,9	7595	9,7	78626	1,1
07	Lower chance of vaginal delivery	11852	15,4	23826	30,9	23703	30,7	9646	12,5	8120	10,5	77147	1,1
08	Lower chance of vaginal delivery	9869	10,9	25624	28,4	35126	38,9	11894	13,2	7771	8,6	90284	1,3
09	Lower chance of vaginal delivery	1721	17,1	3152	31,4	2995	29,8	1511	15,0	675	6,7	10054	0,1
10	Lower chance of vaginal delivery	68112	14,2	143340	29,9	170561	35,6	57348	12,0	39731	8,3	479092	6,7
11		46541	22,6	89112	43,3	41700	20,3	10321	5,0	18128	8,8	205802	2,9
Not informed		183943	12,3	448030	29,9	554128	37,0	186490	12,5	123340	8,2	1495931	20,8
Total		906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100

Source: own authorship

		North		Northeast		Southeast		South		Midwest		Brazil	
VARIABLE		**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	
	Mother's Instruction												
No		8708	42,1	7613	37	2198	10,6	814	3,9	1340	6,5	20673	0,3
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Indigenous		35633	53,9	10735	16,2	5114	7,7	4010	6,1	10671	16,1	66163	0,9
Ignored		14361	5,8	123269	49,4	53652	21,5	11715	4,7	46299	18,6	249296	3,5

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09	Lower chance of vaginal delivery	1721	17,1	3152	31,4	2995	29,8	1511	15,0	675	6,7	10054	0,1
10	Lower chance of vaginal delivery	68112	14,2	143340	29,9	170561	35,6	57348	12,0	39731	8,3	479092	6,7
11		46541	22,6	89112	43,3	41700	20,3	10321	5,0	18128	8,8	205802	2,9
Not informed		183943	12,3	448030	29,9	554128	37,0	186490	12,5	123340	8,2	1495931	20,8
Total		906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100

Source: author

Legend:

1. Nulliparous, singleton pregnancy, cephalic, >37 weeks, spontaneous labor
2. Nulliparous, single pregnancy, cephalic, >37 weeks, with indication of cesarean section before labor
3. Multiparous, (no previous cesarean section) singleton pregnancy, cephalic, >37 weeks, spontaneous
4. Multiparous, (no previous cesarean section) single pregnancy, cephalic, >37 weeks, indicated cesarean section before labor
5. With previous cesarean section, single pregnancy, cephalic, >37 weeks
6. All breech births in nulliparous women
7. All breech births in multiparous women (including previous cesarean section)
8. All multiple pregnancies (including previous cesarean section)
9. All abnormal presentations (including previous cesarean section)
10. All singleton pregnancies, cephalic, <36 weeks, including previous cesarean section
11. Births not classified due to lack of response to the necessary items

Regarding the identification of newborns in the different regions of Brazil, males accounted for 51.2%, with the highest rate in the Northeast region, corresponding to 29.6%. While the female gender was 48.7%, with a predominance also in the Northeast region, 29.6%.

The Apgar score at 1st minute in Brazil obtained the highest score from 8 to 10 (85.6%), with the most prevalent region being the southeast, with 37.1%. The lowest score was between 0 and 2, with 0.7%, and the Central-West region was the least prevalent, with 7.1%. In the 2nd minute, the Apgar score in Brazil was (95.3%), with a score between 8 and 10, and the highest rate was 37.1% in the Southeast region. The region with the lowest percentage was the Midwest, with 7.5%, and scores between 3 and 5.

Regarding the weight of the newborn, (64.7%) were born weighing between 3,000g and 3,999g, with 35.7% being more prevalent in the Southeast region. While the lowest percentage was less than 500g, in the Midwest region 6.8%.

Regarding the type of delivery in Brazil, (50.8%) were vaginal deliveries, with the highest incidence in the Southeast region (35.6%) and (49.1%) were cesarean sections, also with a predominance in the Southeast region (37.6%). The region with the Regarding the type of delivery in Brazil, (50.8%) were vaginal deliveries, with the highest incidence in the Southeast region (35.6%) and (49.1%) were cesarean sections, also with a predominance in the Southeast region (37.6%). The region with the lowest rate of cesarean section was the Midwest, 9.1%, and the lowest rate of vaginal deliveries was also in the Central-West region, 7.2%.

Table 2. RN identification data from 2012 to 2021. Brazil, 2023.

VARIABLE	North		Northeast		Southeast		On		Midwest		Brazil	
	n	%	n	%	n	%	n	%	n	%	N	%
sex												
Mask	464869	12,6	1092909	29,6	1347356	36,5	468649	12,7	312726	8,4	3686509	51,2
Five	441538	12,6	1038346	29,6	1283381	36,6	445013	12,7	298170	8,5	3506448	48,7
Ign	128	9,8	501	38,5	412	31,7	100	7,7	160	12,2	1301	0,02
Total	906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,4	7194258	100
Apgar 1st minute												
0 a 2	5203	10,0	14712	28,4	20396	39,3	7856	15,2	3679	7,1	51846	0,7
3 a 5	16526	8,9	57350	31,0	72617	39,3	25255	13,7	13118	7,1	184866	2,6
6 a 7	77315	12,5	198420	32,1	211452	34,2	78389	12,7	52936	8,6	618512	8,6
8 a 10	771239	12,5	1766188	28,7	2286402	37,1	797137	12,9	534603	8,6	6155569	85,6
Ignored	36252	19,8	95086	51,8	40282	22,0	5125	2,8	6720	13,0	183465	2,6
Total	906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,4	7194258	100
Apgar 2nd minute												
0 a 2	2654	13,6	6507	33,3	6816	34,9	2080	10,6	1479	7,6	19536	0,3
3 a 5	3034	10,9	9049	32,6	9962	35,9	3624	13,1	2087	7,5	27756	0,4
6 a 7	11570	10,9	34996	33,0	36756	34,7	14206	13,4	8470	7,9	105998	1,5
8 a 10	852113	12,4	1985036	28,9	2539853	37,0	888885	13,0	592336	8,6	6858223	95,3
Ignored	37164	20,3	96168	52,6	37762	20,7	4967	2,7	6684	3,6	182745	2,5
Total	906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100
Weight												
Less than 500g	1123	11,7	3939	41,0	3009	31,4	876	9,1	651	6,8	9598	0,1

500 to 999g	2934	9,4	8642	27,7	13109	42,0	4045	13,0	2487	7,9	31217	0,4
1000 a 1499 g	4886	10,6	12601	27,4	18777	40,8	6018	13,1	3732	8,1	46014	0,6
1500 a 2499 g	53002	11,3	129137	27,6	186038	39,8	60178	12,9	39600	8,4	467955	6,5
2500 a 2999 g	195016	11,9	452112	27,5	642654	39,1	207039	12,6	145324	8,8	1642145	22,8
3000 a 3999 g	598703	12,9	1403305	30,2	1662348	35,7	592748	12,7	394021	8,4	4651125	64,7
4000g and more	48792	14,2	121242	35,3	105097	30,6	42816	12,5	25040	7,3	342987	4,8
Ignored	2079	64,6	778	24,2	117	3,6	42	1,3	201	6,2	3217	0,0
Total	906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100
Type of delivery												
Vaginal	508597	13,9	1158304	31,7	1302144	35,6	421897	11,5	264686	7,2	3655628	50,8
Cesario	396826	11,2	969364	27,5	1326673	37,6	491411	13,9	345763	9,7	3530037	49,1
Ignored	1112	12,9	4088	47,6	2332	27,1	454	5,3	607	7,1	8593	0,1
Total	906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100

Source: own authorship

Among the live births in Brazil, data were collected from 361,047 who died in the year 2012 to 2021. It is possible to see that the region with the highest number of live births is the southeast (36.6%). In relation to mortality, the Northeast continues to have infant mortality leading among the regions (53.7%). On the other hand, the Midwest continues to have the lowest rates of live births (8.5%) and infant mortality, the South has the lowest number when compared to the others (43.3%)

The year with the highest rates of live births was 2012 (10.5%) compared to 2021 (9.2%). In relation to mortality, it is possible to associate the time from o to 6 days (26.5%) as the highest index when compared to the other age groups, on the other hand, the age of less than 1 year (ign) is the lowest rate (0.01%).

Table 3. Relationship of live births with infant mortality from 2012 to 2021. Brazil

VARIABLE	**North**		**Northeast**		**Southeast**		**On**		**C.West**		**Total**		
	n	%	n	%	n	%	n	%	n	%	N	%	
Live births													
2012	91813	12,1	229054	30,3	281147	37,1	93457	12,35	61525	8,1	756996	10,5	
2013	92130	12,5	218976	29,6	272981	36,9	93033	12,59	61815	8,4	738935	10,3	
2014	93913	12,6	217620	29,2	275989	37,0	94240	12,65	63245	8,5	745007	10,4	
2015	93044	12,4	219572	29,2	278542	37,1	96873	12,89	63638	8,5	751669	10,4	
2016	89869	12,5	212364	29,4	265309	36,8	92244	12,79	61515	8,5	721301	10,0	
2017	90303	12,4	215697	29,5	267857	36,7	93314	12,78	62947	8,6	730118	10,1	
2018	92089	12,7	216271	29,9	261565	36,2	91392	12,63	62035	8,6	723352	10,1	
2019	89599	12,8	206544	29,6	252526	36,2	88670	12,71	60139	8,6	697478	9,7	
2020	86021	12,8	198088	29,5	242318	36,1	86550	12,91	57412	8,6	670389	9,3	
2021	87754	13,3	197570	30,0	232915	35,3	83989	12,74	56785	8,6	659013	9,2	
Total	906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100	
Infant mortality													
0 to 6 days	25115	27,7	63979	30,0	65414	24,9	20617	22,6	15584	25	190709	26,5	
7 to 27 days	7193	7,9	17769	8,3	24251	9,2	7549	8,3	5032	8,2	61794	8,6	
28 to 364 days	16160	17,8	32820	0,0	39403	15,0	11353	12,4	8768	14	108504	15,1	

Younger 1 year (ign)	4	0,0	7	0,0	13	0,0	4	0,0	12	0,0	40	0,0	
Total	48472	53,5	114575	53,7	129081	49,1	39523	43,3	29396	48	361047	50,2	

Source: own authorship

Table 4 shows a relationship between 7,194,258 women, most of whom fit into one of Robson's 10 groups, with infant mortality. Thus, it is possible to observe that the North (22.6%) and the Northeast (43.3%) had higher rates of women in whom childbirth could not be classified due to lack of response to the items necessary to enter any of the groups. It is also noteworthy that in the Southeast (49.1%) and South (19.2) the most prevalent Robson group was group 2, while in the Midwest (10.5%) it was group 7.

In addition, with regard to infant mortality, the region with the highest infant mortality rates was the Northeast (53.7%) and the one with the lowest rates is the South (43.3%). It should also be noted that the age group with the highest mortality rates was from 0 to 6 days (26.5%), as opposed to the age group of children under 1 year (ign) with extremely low rates (0.01%).

Table 4. Relationship of women who fit into the Robson Classification with infant mortality in the period from 2012 to 2021. Brazil

VARIABLE	North		Northeast		Southeast		On		C. West		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Robson's Groups												
01 Increased chance of vaginal delivery	158361	12,9	433870	35,2	402189	32,7	127051	10,3	109870	8,9	1231341	17,1
02 Increased chance of vaginal delivery	49601	5,3	178192	19,2	456586	49,1	178506	19,2	67149	7,2	930034	12,9
03 Increased Chance of Vaginal Delivery	210365	17,9	411795	35	348790	29,6	109411	9,3	96584	8,2	1176945	16,4
04 Increased Chance of Vaginal Delivery	35485	7,8	97115	21,4	212466	46,8	76942	16,9	32097	7,1	454105	6,31
05 Some Chance of Vaginal Delivery	122936	12,7	256008	26,5	353799	36,7	132158	13,7	99996	10,4	964897	13,4
06 Lower chance of vaginal delivery	7749	9,9	21692	27,6	29106	37	12484	15,9	7595	9,7	78626	1,09
07 Lower Chance of Vaginal Delivery	11852	15,4	23826	30,9	23703	30,7	9646	12,5	8120	10,5	77147	21,4
08 Lower Chance of Vaginal Delivery	9869	10,9	25624	28,4	35126	38,9	11894	13,2	7771	8,6	90284	1,25
09 Lower Chance of Vaginal Delivery	1721	17,1	3152	31,4	2995	29,8	1511	15	675	6,7	10054	0,14
10 Lower chance of vaginal delivery	68112	14,2	143340	29,9	170561	35,6	57348	12	39731	8,3	479092	6,66
11	46541	22,6	89112	43,3	41700	20,3	10321	5,0	18128	8,8	205802	2,86
Not informed	183943	12,3	448030	29,9	554128	37	186490	12,5	123340	8,2	1495931	20,8
Total	906535	12,6	2131756	29,6	2631149	36,6	913762	12,7	611056	8,5	7194258	100
Infant mortality												
0 to 6 days	25115	27,7	63979	30,0	65414	24,9	20617	22,6	15584	25,5	190709	26,5
7 to 27 days	7193	7,9	17769	8,3	24251	9,2	7549	8,3	5032	8,2	61794	8,6
28 to 364 days	16160	17,8	32820	0,0	39403	15,0	11353	12,4	8768	14,3	108504	15,1
Younger 1 year (ign)	4	0,0	7	0,0	13	0,0	4	0,0	12	0,0	40	0,0
Total	48472	53,5	114575	53,7	129081	49,1	39523	43,3	29396	48,1	361047	50,2

Source: own authorship
Caption:

1. Nulliparous, singleton pregnancy, cephalic, >37 weeks, spontaneous labor
2. Nulliparous, single pregnancy, cephalic, >37 weeks, with indication of cesarean section before labor
3. Multiparous, (no previous cesarean section) singleton pregnancy, cephalic, >37 weeks, spontaneous
4. Multiparous, (no previous cesarean section) single pregnancy, cephalic, >37 weeks, indicated cesarean section before labor
5. With previous cesarean section, single pregnancy, cephalic, >37 weeks
6. All breech births in nulliparous women
7. All breech births in multiparous women (including previous cesarean section)
8. All multiple pregnancies (including previous cesarean section)
9. All abnormal presentations (including previous cesarean section)
10. All singleton pregnancies, cephalic, <36 weeks, including previous cesarean section
11. Births not classified due to lack of response to the necessary items

4 DISCUSSION

Studies relating the cesarean section rate based on Robson's classification to neonatal mortality are still scarce, although they are essential for understanding the infant mortality rate. This type of analysis contributes to the orientation of research and intervention programs on determinants of infant mortality, reinforcing the potential of the public health system for prevention and health promotion in the different regions of a country of continental dimensions such as Brazil, which can be extrapolated to similar countries.

Our findings suggest that patients aged 20 to 24 years who fall into group 3 of Robson's classification are the most prevalent in Brazil among the others and are the ones with the highest chance of vaginal delivery. Therefore, it can be inferred that there was an option for cesarean section and not a necessity. It is also possible to observe that the place where Robson's group 3 prevailed was in the Northeast, where the most prevalent level of maternal education was from 1 to 3 years old (47.6%) and the race with the highest numbers was Brown (39.1%), whether it is associated with the choice of the woman or the obstetric indication is not known. Something similar occurred in a study carried out in Honduras regarding the Robson Classification, which related the rates with the importance of induced labor and showed that the group that most prevailed was also 1, 3 and 5, as well as in Brazil, and showed that if these data were analyzed, an alternative could be found that would reduce cesarean deliveries without need. (BANEGAS, 2022)

It is also possible to observe in relation to the NB that the rates of cesarean section and vaginal delivery are very similar, with the latter being slightly higher, with males having the highest numbers in relation to females. Regarding this NB, it is also necessary to relate that in the first and second minute of life of the individuals the APGAR score that had the highest rates of occurrence was that of 8-10, which indicates that most were born with good vitality. And, to top it off, the weight that most prevailed was 3000 to 3999 grams, which, according to the Ministry of Health, shows that it is ideal for a healthy newborn. (MINISTRY OF HEALTH, 2012)

In addition, it is noteworthy that, despite what has been shown, the highest infant mortality rates are found in the period of 0-6 days, we can infer that something that occurred during childbirth may have caused such a statistic, such as, for example, an indication of incorrect cesarean section. As

an example, we have the North region, which, despite having the second lowest rate of live births, has the second highest rate of infant mortality, with emphasis on the period already mentioned. Analyzing the Northeast, it is possible to see that it has the highest infant mortality rates among the regions, and the Robson Group that most prevailed was group 1, which had the highest chances of a successful vaginal delivery and even so, the Apgar score that had the highest numbers was 6-7 in the first minute and 0-2 in the second minute. and weighing less than 500g.

However, despite the above, given the impossibility of going to the field to collect all the information necessary for this article because it is a national study with several indicators, it is necessary to mention that the research has limitations in relation to the database, which, as it is a resource with information from all regions of the country, requires constant updating. Thus, in addition to finding several indicators with the highest rates being in uncollected data, it was necessary to collect a long period to be able to work with larger values and acquire a more complete result.

Thus, it is vital that the subject addressed in the following work serves as a basis for further research so that the content of the theme remains updated, an example of how this can be done is by investigating more deeply within each region the reason for deaths in the first days of the newborn's life and even the cause of cesarean sections being performed in women who are part of Robson groups that have chances vaginal delivery. In this way, knowledge about this topic that is so relevant today will be expanded.

5 CONCLUSION

It is common sense that vaginal delivery has numerous benefits for the newborn, both in terms of immunity and for the mother in the postpartum period. The increase in the mortality rate is due to the inadequate choice of cesarean sections and the reduction in vaginal deliveries. This research demonstrated from Robson's classification that the frequency of mortality is still growing and children's health problems are increasing. Therefore, it is necessary to develop viable strategies to reverse this growing trend in infant mortality, caused by the inadequate choice of the type of delivery, starting with increased investments in information, so that infant mortality rates decrease.

REFERENCES

ALMEIDA LINS, J, A aplicação da classificação de robson nas maternidades brasileiras como ferramenta para redução das taxas de cesariana: uma revisão de literatura, Universidade Federal de Alagoas, 2021, CDU: 616-083-089.888.61 acesso em: 8 set. 2023.

BOING, A, F, et al. Epidemiologia: indicadores de Saúde, UNA-SUS, 2008, Disponível em: https://unasus2.moodle.ufsc.br/pluginfile.php/33455/mod_resource/content/1/un2/top4_1.html, acesso em: 10 set. 2023

Classificação de Robson, Fiocruz, 2018, Disponível em: https://portaldeboaspraticas.iff.fiocruz.br, acesso em: 27 set. 2023.

LANSKY, S. et al. Pesquisa nascer no Brasil: perfil da mortalidade neonatal e avaliação da assistência à gestante e ao recém-nascido. Cadernos de Saúde Pública, V.30, p.S192-S207, 2014 https://doi.org/10.1590/0102-311X00133213 acesso em: 6 set. 2023.

LARANJEIRA, A, Cesariana sem indicação pode aumentar risco de óbito na infância, Fiocruz, 2021, Disponível em: https://portal.fiocruz.br/noticia/cesariana-sem-indicacao-pode-aumentar-risco-de-obito-na-infancia-0, acesso em: 10 set. 2023.

Mortalidade infantil e seus componentes, Prefeitura de Ponta Grossa, 2017, Disponível em: https://www.pontagrossa.pr.gov.br/node/34101, acesso em: 27 set. 2023.

NAKAMURA, P, M., DO CARMO LEAL, M., ESTEVES,P, AP *et al.* Uso da classificação de Robson para avaliação da taxa de cesárea no Brasil: o papel da fonte de pagamento do parto. *Reprod Health* 13 (Suplemento 3), 128 (2016). https://doi.org/10.1186/s12978-016-0228-7 acesso em: 6 set. 2023.

REYMAN, M., van Houten, ma, van Baarle, D. et al. Impacto da dinâmica da microbiota intestinal associada ao modo de parto na saúde no primeiro ano de vida. Nature Communications 10, 4997, 2019 https://doi.org/10.1038/s41467-019-13014-7 acesso em: 6 set. 2023.

Who Statement On Caesarean Section Rates, World health organization, 2015, Disponível em: https://iris.who.int/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf acesso em: 10 set. 2023.

Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. (2014). Atenção à saúde do recém-nascido: guia para os profissionais de saúde (2a ed. atual.). Brasília: Ministério da Saúde.

JUSTO GIUGLIANI, E. et al. Atenção à saúde do Recém-Nascido: guia para os profissionais de saúde. Ministério da saúde, 2014. Disponível em: https://bvsms.saude.gov.br/bvs/publicacoes/atencao_saude_recem_nascido_v1.pdf. Acesso em: 05. out. 2023