

Factors associated with births not registered at the registry office of a Brazilian National Health System maternity hospital, Nova Iguaçu-RJ, Brazil, 2012

doi: 10.5123/S1679-49742015000300009

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Abstract:

Objective: to analyze factors associated with births not registered at a National Health System (SUS) maternity hospital registry office in Nova Iguaçu-RJ, Brazil. **Methods:** a cross-sectional study of data on 468 live births (LB) between June-July 2012. The dependent variable was births not registered at the registry office within 15 days following birth. Prevalence ratios (PR) and 95% confidence intervals (95% CI) were estimated using Poisson Regression. **Results:** 40.6% (190/468) of LB were not registered at the registry office. Non-registration was positively associated with little or no maternal schooling (PR 1.41; 95% CI 1.04-1.93), childbirth prior to hospitalization (PR 2.15; 95% CI 1.04-4.46), and mother resident in a different municipality to the hospital (PR 1.39; 95% CI 1.03-1.89). **Conclusion:** mothers with little or no schooling and who do not give birth in hospital should receive guidance on birth registration.

Key words: Live Birth; Birth Registration; Parturition; Cross-Sectional Studies.

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Introduction

The birth certificate is the first right of an individual. It is the document that registers their existence to the State, giving them identity, name and nationality, essential conditions for being a citizenship.¹ The birth certificate is one of the sources used for conducting vital data statistics, which can assist in population health assessment, in the development of epidemiological surveys, in the formulation of indicators and in health programs assessment and planning.²

In Brazil, with the creation of the Information System on Live Births (*SINASC*), health institutions began to document the birth of a live-born child officially, by issuing the Live Birth Declaration (*DNV*).³ It is a form that contains three copies: one of the copies is given to the child parents, another one is filed with the medical record and the third one is sent to health secretariats, to feed *SINASC*. In Brazil, the National Human Rights Program (*PNDH-3*) has established some actions to the universalization of birth registration and expansion of basic documentation, which emphasizes *DNV* strengthening as an access mechanism to the civil registry and extending the issue right to midwives.⁴ Although *DNV* is considered the first vital data document, it is essential for the life of Brazilian citizens, the public registration in the Civil Registry Office. This office is responsible for issuing the birth certificate, which absence makes nearly 7% of the children born in the country “invisible” to the State – and, therefore, to public policies.⁵

The expression ‘live birth’ means the complete expulsion or extraction of an individual out of the mother’s body, regardless of the pregnancy length, and that, after separation from the mother’s body, it can breathe or show any other sign of life.⁴ All live-born children in Brazil are entitled to registration and issuance of birth certificate at a registry office. In addition to individual issues, such as identity card and citizenship, birth data supplied by Brazilian registry offices are useful for the development of indicators used in the design of public policies for Health.⁶

In Brazil, some initiatives have been promoted aiming to motivate parents to register their children’s birth in civil registry offices and obtain, as soon as possible, the birth certificate, such as: (i) grant, by the Ministry of Health, of bonuses for health care units that encourage families to register their children before the mother’s

hospital discharge; and (ii) setting up of registry offices in maternity hospitals.⁵

Despite the implemented measures, in 2010, 600,000 Brazilian children were believed not to have birth certificate, almost 29,000 of them are from Rio de Janeiro State, which corresponds to 4.8% of not registered births in the country.⁵ One of the strategies to reduce birth under registration has been the opening of civil registry offices in public maternity hospitals. This measure intends that no child gets discharged from the hospital without the mother carrying with her the official birth certificate. In addition to setting up registry offices, other measures to be taken, related to the conditions of pregnant women, of childbirth or of the newborn, can contribute to the greater adherence of mothers to the initiative of emitting the birth certificate still in the maternity hospital.

All live-born children in Brazil are entitled to registration and issuance of birth certificate at a registry office.

This study aimed to analyze factors associated with births not registered at a Brazilian National Health System (*SUS*) maternity hospital registry office in the city of Nova Iguaçu, Rio de Janeiro State (RJ), Brazil.

Methods

This is a cross-sectional study developed with secondary data obtained by reviewing medical records of a sample of mothers assisted in a public maternity hospital, located in the city of Nova Iguaçu, Rio de Janeiro State. This municipality belongs to the *Metropolitan Region I* of the state, it is about 28 km far from the capital of Rio de Janeiro State (city of Rio de Janeiro) and, in 2010, had an estimated population of 796,257 inhabitants, presented an average human development index of 0.713 and more than 60% of people at the age of 17 and older with complete elementary school.⁷

The service provided by the maternity hospital, designed to assist high-risk pregnancies, was not regulated and could be used by all the population, holding about 40% of births in the municipality. The unit had prenatal clinic and support services such as blood bank, neonatal and adult intensive care unit (ICU), in addition to offering a multidisciplinary care

team, including physicians, nurses, psychologists and social workers. At the time of the study, the maternity hospital supported the “*Iniciativa Hospital Amigo da Criança*” (Child-friendly Hospital Initiative) and developed practices with multidisciplinary teams, including activities to encourage mothers to seek the babies’ registration in the hospital registry office.

From June 15 to July 31, 2012, all mothers who gave birth to live-born children in this hospital or were assisted immediately after the baby birth were considered for inclusion in the study. The cases involving maternal death were excluded.

The sample was calculated using the statistics package Epi Info, with a 95% confidence level, 80% statistical power and estimate risk ratio of 2, to assess the association between exposures and the outcome ‘absence of birth registration’, considering a 10% prevalence for this event. All the live births that took place in that unit between June 15 and July 31, 2012 were considered eligible for the study. The sample was estimated in 438 live births.

The data were gathered by consulting the register of births that happened during the studied period, followed by identification of records, verification of the DNV copy and of the copy or note of the birth certificate. The date of each live birth and the mother’s name, which were in the birth registration books, were the variables used for identification and selection of medical records for consultation. The information on the birth certificate was obtained 15 days after the delivery day, because this is the deadline for drafting the document in registry offices of maternity hospitals. The query was based on two actions, each directed to a source of research: (i) checking the copy of the archived document, with the medical record; and/or (ii) identifying the birth registration, by consulting the civil registry office in the maternity hospital.

The absence of the baby’s birth certificate copy with the medical record or in the electronic files of the registry office defined the dependent variable certificate (yes, no). The independent variables were obtained from the DNV pink copy and from notes recorded in the medical record, containing the following characteristics:

- a) maternal
 - age, in years (<20; ≥20);
 - skin color (non-white; white);
 - municipality of residence (neighbor to the maternity hospital municipality; maternity hospital municipality);

- schooling, in years of study (0-8; ≥9); and
- number of live children at home (none; 1; >1);
- b) father
 - age in years (<20, ≥20); and
 - father’s name not stated in DNV (yes, no);
- c) current pregnancy
 - prenatal care (yes, no); and
 - birth place in the hospital (yes, no);
- d) the newborn
 - sex (male, female);
 - weight at birth, in grams (<2,500 g; ≥2.500 g); and
 - post-partum destination (neonatal ICU; room)

Initially, a descriptive statistical analysis was held to estimate the average and standard deviation (SD) of the numeric variables and absolute and relative frequencies of categorical variables. We calculated the crude prevalence ratios (PR) and the 95% confidence intervals (95% CI) with the Poisson Regression, considering the variables of $p \leq 0.25$ for further analysis. In multivariate modeling, the variables were included in the model one by one, using the strategy known as stepwise forward regression to obtain PR adjusted by other variables and a more parsimonious model. When enhancing mainly the theoretical concepts, variables that had value of $p \leq 0.05$, or those which, when removed from the model, varied at least 10% in PR, were considered confounding factors and were maintained in the multivariate analysis.

The data was typed in Microsoft Word and Microsoft Office ACCESS 2003. Data analysis was conducted by the statistical package R version 2.9.2.

Exceptional care was taken to ensure anonymity and confidentiality of the collected information. The study was conducted after approval by the Research Ethics Committee of the Nova Iguaçu General Hospital (HGNI), with the Presentation Certificate for Ethics Assessment (CAAE) No 10145012.1.0000.5254 and Report No 176,969, dated December 18, 2012.

Results

In the 45 days of study, 461 mothers gave birth to 468 live-born babies. There were no exclusions motivated by maternal death. However, 15 occurrences were excluded because their respective medical records were not available in the medical file. The average maternal

age was 23.5 years old (standard deviation [SD] = 6.2 years), the father's age was 27.8 years old (SD = 7.8 years) and gestational age was of 37.8 weeks (SD = 3.0 weeks). 26.5% of mothers lived in a different municipality to the hospital, and Belford Roxo was the second municipality in frequency of births in the studied maternity hospital (9.2%). Upon DNV completion, 7.4% of mothers omitted the father's name. Nine babies were born before hospitalization, three of them at home and six on the street, on the way to the hospital; 98.1% of births happened in the hospital. The distribution by sex

of live births was similar, with an average birth weight of 3,058.07 g (SD = 687.3 g); 15.4% of babies were born weighing less than 2,500 g. Immediately after birth, most babies (88.5%) were sent to the room, to be with their mothers, and the others to the neonatal ICU (Table 1).

A total of 190 live-born babies (40.6%) did not have a birth certificate recorded in the maternity hospital's registry office. In the bivariate analysis, the factors associated with lack of birth registration in the maternity hospital's registry office were:

Table 1– Characteristics of mothers and live-born babies of the maternity hospital *Hospital Geral de Nova Iguaçu*, municipality of Nova Iguaçu, Rio de Janeiro State, Brazil, June to July 2012.

Variables	n	%	95%CI ^a
Maternal age (in years)			
<20	143	30.5	26.4;34.7
≥20	325	69.4	65.2;73.6
Skin color^b			
Non-white	413	89.2	86.4;92.0
White	50	10.8	7.9;13.6
Municipality of residence			
Neighbor to the maternity hospital	124	26.5	22.5;30.5
The same as the maternity hospital	344	73.5	69.5;77.5
Schooling (in years of study)			
0;8	285	60.9	56.5;65.3
≥9	183	39.1	34.7;43.5
Live children at home^b			
None	192	41.9	37.4;46.5
1	128	28.0	23.8;32.1
≥2	138	30.1	25.9;34.3
Father's age (in years)^b			
<20	46	11.3	8.2;14.4
≥20	362	88.7	85.6;91.8
Father's name not declared^b			
Yes	34	7.4	5.0;9.8
No	423	92.6	90.1;95.0
Prenatal care			
No	47	10.0	7.3;12.8
Yes	421	90.0	87.2;92.7
Where the birth took place			
Extra-hospital	9	1.9	0.7;3.2
Hospital	459	98.1	96.8;99.3
Sex of the newborn			
Male	238	50.8	46.3;55.4
Female	230	49.2	44.6;53.7
Weight at birth (in grams)			
<2.500 g	72	15.4	12.1;18.7
≥2.500 g	396	84.6	81.3;87.9
Destination of the newborn after birth			
Intensive Care Unit (ICU)	54	11.5	8.6;14.4
Room	414	88.5	85.5;91.4

a) 95%CI: 95% confidence interval

b) Variables with lack of information: skin color (1.1%), live children at home (2.1%), father's age (12.8%) and father's name not declared (2.4%)

- Mother's schooling of 0-8 years of study (PR 1.46, 95%CI 1.07; 1.99; p = 0.002);
- Place of extra-hospital birth (PR 2.24, 95%CI 1.10; 4.55; p = 0.004);
- Municipality of residence different to the maternity hospital (PR 1.40, 95%CI 1.04; 1.90; p = 0.004);
- Lack of prenatal care (PR 1.54; 95%CI 1.04; 2.31; p = 0.007); and
- Having two or more living children at home (PR 1.45, 95%CI 1.04; 2.04; p = 0.019).

After multivariate analysis, the factors that remained statistically associated with the outcome ($p < 0.05$) were 'mother's schooling of 0-8 years of study' (PR 1.41, 95%CI 1.04; 1.93), 'municipality of residence different to the maternity hospital' (PR 1.39, 95%CI 1.02; 1.89) and 'extra-hospital birth' (PR 2.15; 95%CI 1.04; 4.46). After the adjustment, we decided to keep the variable 'lack of prenatal care' (PR 1.28, 95%CI 0.85, 1.95), as confounding factor among the examined characteristics and the variable 'absence of birth registration' in the maternity hospital's registry office (Table 2), due to the appreciation of the theoretical concepts and the strong significance of this variable in the crude analysis ($p = 0.007$).

Discussion

Mothers with low education level, living in different municipalities to the maternity hospital, and who gave birth before hospitalization, showed a higher frequency of non-seeking the maternity hospital's registry office to record their babies' birth. Owing to the fact that Brazil achieved a great reduction in birth under registration, actions in small places, such as setting up registry offices in maternity hospitals, may be directed to the outlined women's profile and, thus, constitute a specific strategy to further decrease the number of children not officially recognized in Brazil.

The United Nations Children's Fund (UNICEF) has estimated that, in 2000, 41% of births in the world remained unregistered, meaning 50 million children without a name, identity and nationality.⁸ In Brazil, measures to solve this problem began in the 1990s. First, the gratuity to obtain civil registry was guaranteed by the Federal Law 9,534, dated December 10, 1997.⁹ After that, the Ministry of Health signed a Letter of Intent with the Association of Brazilian Registry Officers (ANOREG-BR)

in order to establish conditions of mutual cooperation and facilitate the recording of birth certificates directly in public maternity hospitals throughout the country.¹⁰ Despite the measures implemented, the maximum acceptable target of 5% of births not registered established by the World Health Organization (WHO) has not been reached in the country yet.⁵

The registered birth represents for the child a first act of social recognition.⁵ Leaving the maternity hospital without this right means the loss of opportunity to document the child's existence to the State. In doing so, mothers can be deprived of the State support to face other problems such as the lack of paternity recognition.¹¹ A survey conducted in the Brazilian Northeastern region pointed out that the paternity denial was present in 10% of births not registered.¹² Under these circumstances, when the child's register is made only by the mother and there is a wish to indicate and inform the father, he may be ordered by justice and the problem solved, based on the Law No. 8,560, dated December 29, 1992.¹³ Furthermore, postponing the registry may leave the child in many different vulnerable situations, such as violence, child trafficking, illegal adoption and less access to social rights - including formal education, subject to official confirmation of the child's existence.⁸

According to this study, one in four mothers lived in a different municipality to the maternity hospital, including all the municipalities of the *Baixada Fluminense* region. Living in other municipalities was associated with births not registered in the maternity hospital's registry office.

A large population-based study, conducted in Australia, assessed the factors associated with non-registration of live-born babies up to five years after delivery day:¹⁴ its authors reported a frequency of 95.1% of registries in the end of the fourth year after the birth day and one of the factors identified by them associated with the non-registration was the mother's residence in areas far from large urban centers. In Rio de Janeiro State, in 2010, approximately 15,000 children between 0-10 years old were estimated to live without a birth certificate and, therefore, "invisible" to the government. In the *Baixada Fluminense* region, peripheral area to Rio de Janeiro metropolis, it is estimated that the lack of birth certificate affects municipalities such as Duque de Caxias, São João de Meriti and Belford Roxo with 2,774, 1,058 and 1,020 children without a birth certificate, respectively.¹⁵

Table 2 – Prevalence, bivariate analysis and multivariate analysis with predictive final model of lack of birth registration (n = 468 live births) in civil registry office situated in a National Health System maternity hospital in the city of Nova Iguaçu, Rio de Janeiro State, Brazil, June to July 2012.

Variables	Prevalence	Crude		Adjusted	
		PR ^a (95%CI ^b)	Value p ^c	PR ^a (95%CI ^b)	Value p ^c
Maternal age (in years)					
<20	41.3	1.02 (0.75;1.39)	0.919	0.99 (0.97;1.02)	0.597
≥20	40.3				
Skin color^d					
Non-white	41.6	1.30 (0.78;2.17)	0.223	1.30 (0.77;2.17)	0.314
White	32.0				
Municipality of residence					
Different to the maternity hospital	51.6	1.40 (1.04;1.90)	0.004	1.39 (1.02;1.89)	0.034
The same as the maternity hospital	36.6				
Schooling (in years of study)					
0;8	46.3	1.46 (1.07;1.99)	0.002	1.41 (1.04;1.93)	0.029
≥9	31.7				
Live children at home^d					
None	33.8	1.00	0.019	1	
1	39.8	1.17 (0.81;1.70)		1.16 (0.80;1.67)	0.422
≥2	49.3	1.45 (1.04;2.04)		1.27 (0.89;1.80)	0.177
Father's age (in years)^d					
<20	56.5	1.47 (0.97;2.24)	0.070	1.45 (0.95;2.21)	0.081
≥20	38.4				
Father's name not declared^d					
Yes	47.1	1.17 (0.70;1.97)	0.469	1.05 (0.62;1.77)	0.845
No	40.0				
Prenatal care					
No	59.6	1.54 (1.04;2.31)	0.007	1.28 (0.85;1.95)	0.234
Yes	38.5				
Where the birth took place					
Extra-hospital	88.9	2.24 (1.10;4.55)	0.004	2.15 (1.04;4.46)	0.040
Hospital	39.6				
Sex of the newborn					
Male	40.3	0.98 (0.74;1.31)	0.925	1.05 (0.79;1.41)	0.715
Female	40.9				
Weight at birth					
<2.500 g	31.9	0.75 (0.49;1.17)	0.118	0.63 (0.40;1.19)	0.147
≥2.500 g	42.2				
Destination of the newborn after birth					
Intensive Care Unit (ICU)	31.5	0.75 (0.46;1.24)	0.185	0.66 (0.39;1.11)	0.120
Room		41.8			

a) PR: prevalence ratio

b) 95%CI: 95%confidence interval

c) chi-square test for heterogeneity of proportions

d) Variables with lack of information: skin color (1.1%), live children at home (2.1%), father's age (12.8%) e father's name not declared (2.4%)

Although very close to the state capital, the *Baixada Fluminense* has important social problems. A significant part of its population is socioeconomically disadvantaged when compared to the capital, with proportional consequences on local living and health conditions. In

Londrina, Parana State, women with no schooling or with incomplete elementary school were more likely to not register their children. Negligence and lack of legitimacy of paternity were considered important factors in the decision of not registering the child.¹⁶

It is worth mentioning two family representative indicators, used by the United Nations Development Programme (UNDP), and place the degree of social vulnerability to which women and children in *Baixada Fluminense* are exposed to: first, (i) of the 12 municipalities in that region, five (Japeri, Duque de Caxias, Seropédica, Mage and Queimados) present ratio higher than 20% of mothers as head of family without elementary school level and with underage child; and when it comes to the work and income situation, (ii) all 12 municipalities have a ratio above 20% of individuals vulnerable to poverty, five of these municipalities (Japeri, Nova Iguaçu, Belford Roxo, Queimados and Magé) have than 30%. These circumstances suggest the presence of areas of poverty, related to unfavorable outcomes such as the birth not registered.

The birth not registered is defined by the Brazilian Institute of Geography and Statistics (IBGE) as a set of births not registered in the year of occurrence or up to the end of the first quarter of the subsequent year.⁵ Possibly, most mothers who leave the maternity hospital without registering their babies do it later, not characterizing under-registration. In the present study, the proportion of babies with birth certificate issued in the first 15 days of life, in the maternity hospital (59.4%), was similar to that found for the municipality of Ribeirão Preto, São Paulo State, according to a study with participants of nine institutions which are not partners of registry offices.¹⁷ Nevertheless, such actions are aimed at obtaining the birth certificate before hospital discharge and the identification of conditions that make non-registration easy can help in designing and implementing measures in that direction, while optimizing the resources employed. Another important finding associated to the lack of birth registration in maternity hospitals, besides low education level, and difficult to solve in short term is the extra-hospital birth.

In Brazil, 0.4% of births are estimated to occur in non-hospital environments.¹⁸ Although this rate seems low, its distribution across the country is uneven. According to the 2006 Demographic and Health Survey (DHS),¹⁹ conducted in all five Brazilian regions, the report of home birth of live-born babies was more frequent in the regions Northeast (1.6%) and North (7.5%). These regions also account for the higher frequency of live not registered births.⁵

In Australia,²⁰ actions to reduce under-registration include, among other measures, monitoring the extra-

-hospital birth undertaken (i) without the assistance of midwives and healthcare professionals and (ii) without hospital care within 24 hours. There, the mother must communicate by phone with the department responsible for the registries and provide the name and address of two childbirth witnesses. The Australian process continues with an exchange of correspondence, including copies of the witnesses identity documents, and is concluded with the mother receiving the birth certificate, which is sent by mail.

In Ghana, a project led by international organizations made use of community volunteers. They are responsible for capturing information about births or children under five years old death and report them to the district supervisors, via mobile phones.²¹ In Mexico, another study which analyzed 20 municipalities with very low Human Development Index (HDI), estimated that 68.1% of the births in 2007 and 2008 did not present birth certificate.²² One of the factors related to lack of birth certificate was births assisted by midwives.

In Brazil, in recent decades, there has been considerable reduction in under-registration of births.

Surveillance of extra-hospital births can be a way to refine the actions of identification of not registered children and, thus, avoid them to remain as socially excluded minorities. Mothers admitted for postpartum care occurring outside the hospital should be given attention and be properly instructed, during their stay in hospital, about the facilities for obtaining a birth register, overcoming the barriers that prevent them, and their children, from enjoying their rights.

It is important to emphasize that the lack of registration and poor living conditions are closely related, ultimately feeding a vicious circle in which the child remains in a situation of exclusion, including under the risk of violence.²³ Although the proportion of the population devoid of birth registration is small, the phenomenon is complex and of great impact on the children's and future adults' lives. This finding increases the responsibility of everyone involved in resolving the issue, including the health services.

For the children, the birth certificate is an open door to citizenship, to the right to a name, to the family, to Brazilian nationality, including access to constitutional rights such as the right to health, and to the protection against vulnerability arising from situations of lack of an identity document. According to a UNICEF study conducted in 15 countries, from 1999 to 2003,

having or not a legally registered birth was associated with availability of vaccination card (14 countries), having presented diarrhea in the two weeks prior to the interview (6 countries) and having presented fever in the two weeks prior to the interview (6 countries).²⁴

This is a pioneer study in research on factors associated with the absence of issuing the birth certificate in a maternity hospital benefitted from the setting up of a registry office's advanced post. This work was developed at a time when government authorities spend a large amount of resources to solve the birth under-registration problem in the country. However, the study has limitations. First, it was conducted with secondary data from medical records, not being possible to obtain information directly from the mothers about the reasons for non-registration. The lack of consistent information on marital status did not allow this characteristic be adequately evaluated among the possible associated factors. Finally, only the father's data contained in the DNV could be evaluated; an important issue for emitting the birth certificate, the acknowledgment of paternity, could not be analyzed.

This present study allowed to outline the factors

associated with birth not registered of live born children in a civil registry office set up in a SUS maternity hospital. Low education level mothers who give birth to their children before the hospitalization and who live in neighbor municipalities to the maternity hospital are those with higher risk of not benefitting from the right provided by the registry office. Measures targeted to this profile of women can help improving actions to reduce the births under-registration in the country, the first step towards the effective protection of children and the guarantee of their right to leave the maternity officially recognized as Brazilian citizens.

Authors' Contributions

Nascimento MI, Rocha LB, Cunha MC and Silva GPR participated in the conception, design, analysis, results interpretation and manuscript writing.

Flauzino RF participated in the analysis and critical revision of the manuscript.

All the authors revised and approved the final version of the manuscript and are responsible for all its aspects, including the assurance of its accuracy and integrity.

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Received on 02/11/2014
Approved on 25/02/2015