Publication status: Preprint has been published in a journal as an article
DOI of the published article: https://doi.org/10.26633/RPSP.2025.86

Who are the women having non-institutional deliveries in Brazil and who attends them? An analysis of 13.7 million births (2018-2022)

Larissa Adna Neves Silva, Cauane Blumenberg, Aluisio J D Barros

https://doi.org/10.1590/SciELOPreprints.11751

Submitted on: 2025-04-14
Posted on: 2025-04-15 (version 1)
(YYYY-MM-DD)

Who are the women having non-institutional deliveries in Brazil and who attends them? An analysis of 13.7 million births (2018-2022)

Quem são as mulheres que têm partos não institucionais no Brasil e quem as atende? Uma análise de 13,7 milhões de nascimentos (2018-2022)

Larissa A N Silva[1] orcid.org/0000-0003-4287-5844
Cauane Blumenberg[1] orcid.org/0000-0002-4580-3849
Aluísio J D Barros[1] orcid.org/0000-0002-2022-8729

[1] International Center for Equity in Health and Postgraduate Program in Epidemiology, Federal University of Pelotas, Pelotas, Brazil

Corresponding author: Larissa A N Silva
E-mail: ladna@equidade.org
Address: Rua Marechal Deodoro, 1160 – 3° Piso, Bairro Centro – Pelotas, RS, Cep: 96020-220 – Caixa Postal 464

Competing interest: None declared

Authors' contributions: All authors contributed to the study's conception and design, data analysis and interpretation, drafting and critical revision of the manuscript, and approved the final version.

Acknowledgments: This work was supported by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Funding Code 001).

Abstract

Objective: Over 13 million pregnancies in Brazil were analyzed to identify groups of women more likely to have deliveries outside health facilities, applying an equity approach to assess social determinants. Additionally, the types of professionals attending these deliveries were examined. **Methods:** Data from the Live Birth Information System (SINASC) from 2018 to 2022, were used to investigate non-institutional deliveries according to the region of residence, ethnicity/skin color, schooling, and age, as well as the intersections of these factors. The proportion of births attended by doctors, nurses/midwives, traditional birth attendants, and others was also analyzed, comparing institutional and non-institutional deliveries. **Results:** The overall prevalence of non-institutional deliveries was 1.0%. Higher proportions were observed in the North region (4.0%), among Indigenous women (26.3%), adolescent mothers (1.4%), and those with less than four years of schooling (8.3%). The proportion of non-institutional delivery rose to 67.6% among low-educated, Indigenous women from the North region. Indigenous women with less than 4 years of schooling and having a non-institutional delivery presented the highest proportion of delivery without a qualified professional (95.2%). **Conclusions:** Cultural norms and barriers to accessing maternity services, combined with broader social inequalities and organizational challenges faced by Indigenous populations, may contribute to the high proportion of these deliveries observed among these women. Culturally sensitive strategies to expand access and empower Indigenous women are crucial to ensuring their survival as well as their children's.

Keywords: Maternal Health Services; Live Birth; Health Inequities; Delivery.

Introduction

Delivery care models vary considerably between countries. In some, deliveries are almost exclusively performed in hospitals (1), while programs focused on home delivery care exist in others (2). In Brazil, almost 99% of births occur in hospitals (3). The proportion of hospital deliveries increased significantly from the 1970s onwards, driven by urbanization, the expansion of medical care, and changes in social behavior (4). This trend accelerated particularly after creating the Unified Health System (SUS) in 1988, which enhanced access to institutional healthcare (5). However, this pattern has changed with the growing movement to value alternative and humanized practices in childbirth, driven by concerns over excessive medicalization, such as cesarean sections (5), and disrespect, and abuse during institutional deliveries (6).

In Brazil in the 1980s, home deliveries accounted for 16.6%(7) of all births, falling to 0.7% in 2022 (3). Although non-institutional deliveries currently account for a tiny proportion of births, the literature highlights this group's specific social and epidemiological characteristics. Most women live in rural areas (8), are from the North Region (9), have lower levels of education (4), and are in families with less access to health services (10). Furthermore, these deliveries often occur within contexts where cultural practices and traditions that value home delivery are prominent, such as among Indigenous women (11). Studies also indicate that, in some cases, women who opt for this type of delivery seek a more intimate and natural environment with fewer medical interventions and greater autonomy over the process (12). However, these births, also called planned home deliveries, generally occur in urban areas and are limited to women who can afford the costs of a specialized team and minimum infrastructure to ensure safe delivery (12,13).

On the other hand, unplanned or accidental home deliveries are more common among women in situations of greater social vulnerability who face challenges in ensuring adequate care conditions and may lack access to qualified professionals, which puts their safety and the baby at risk. Studies indicate that these types of deliveries are associated with higher risks, such as higher maternal and neonatal mortality (14). Within the framework of the Sustainable Development Goals (SDGs), particularly the commitment to "leave no one behind" (16), it is crucial to ensure that all health services, including childbirth care, are accessible and provide a safe and respectful environment for all women, regardless of their socioeconomic status. Therefore, it is essential to know the

women who give birth outside of health facilities so that strategies can be developed to promote equity.

In this study, we analyzed over 13 million pregnancies among women residing in Brazil, aiming to assess sociodemographic patterns by applying an equity lens to identify groups of women more likely to have deliveries outside health facilities, using stratifications and intersections between social determinants. We also analyzed the proportion of births among women who were attended by doctors, nurses/midwives, traditional birth attendants, and others, comparing institutional and non-institutional deliveries.

Methods

A cross-sectional study was conducted using data from the Brazilian Live Birth Information System (SINASC) from 2018 to 2022, the most recent years available at the time of the analysis. Nearly 99% of the live births in Brazil are registered in SINASC (17), which contains detailed information about the mother, the child, and the delivery. Variables in the system include sociodemographic characteristics such as age, skin color, schooling, information on pregnancy, such as antenatal care, delivery, such as the location and who assisted, and the newborn, such as birthweight, Apgar, and gestational age (15).

The indicator analyzed was non-institutional delivery, defined as delivery outside a health facility of any kind. The non-institutional locations were recorded as home, Indigenous village, or another place. Details about other places are unavailable in SINASC, but common situations include deliveries in public spaces, public transport, or prisons (15). Since the proportion of non-institutional deliveries in the country is low, we pooled data from the last five years with available data - 2018 to 2022, the proportion of non-institutional deliveries ranging from 0.9% in 2018 to 1.0% in 2022. The birth records in SINASC include practically all births in the country. Therefore, we treated the data as the entire population, not a sample, and did not present variability estimates for the proportions in the descriptive analysis.

To understand who are the women who had a delivery outside of a health facility, we calculated the proportions by region of residence (North, Northeast, South, Southeast, and Midwest), ethnicity/skin color (white, brown (“pardas” is the term used in Portuguese by the Brazilian Institute of Geography and Statistics, IBGE), black, Indigenous), schooling (less than 4 years, 4 to 11 years, and 12 years or more), age at delivery (up to 19 years, 20 to 34 years, and 35 years or more), and birth attendant (doctor,

nurse/midwife, traditional birth attendant (TBA), and others). The ethnicity/skin color category 'yellow' (Asian/Oriental origin) was excluded due to its small proportion (0.5%). We also did double or triple stratifications to understand better how individual characteristics interact.

Regarding birth attendants, we assessed the proportion of births attended by doctors, nurses/midwives, TBAs, and others according to institutional and non-institutional deliveries. All the proportions were also described based on women's sociodemographic characteristics. The category TBA refers to individuals who attended births regularly without formal training for the job, irrespective of being linked to a healthcare service. The category 'others' refers to individuals not linked to a healthcare service who do not usually attend births, most often a partner, a firefighter, a police officer, or another (15).

SINASC data is publicly available, with all information verified, standardized, and anonymized. The data were obtained from OPENDATASUS (https://opendatasus.saude.gov.br/). Since this research is based on anonymous, publicly accessible data, no ethics clearance was needed (Resolution No. 510, 2016, National Health Council, MoH). All analyses were performed using Stata (StataCorp. 2023. Stata Statistical Software: Release 18. College Station, TX: StataCorp LLC.).

Results

Between 2018 and 2022, Brazil recorded 13,762,655 births. Of all mothers, 38.5% were from the Southeast region, which is also the most populous. The majority of women were aged between 20 and 34 years (69.4%), had 4 to 11 years of education (76.1%), identified as being brown (57.8%), had their delivery attended by a doctor (88.5%), and gave birth in the same municipality where they resided (67.6%) (Table 1).

The prevalence of non-institutional deliveries in the five years was 1.0%. In 2018, the prevalence was 0.9% and increased slightly until 2021, reaching 1.1%, and decreasing to 1.0% in 2022. Among these deliveries, nearly 70% occurred at home, 22.4% in other places, and 8.5% in Indigenous villages. The highest prevalence was observed among mothers residing in the North region (4.0%), those identifying as Indigenous (26.3%), aged 19 years or less (1.4%), and with less than four years of schooling (8.3%) (Table 1).

Regarding ethnicity, Indigenous women had the highest proportion of non-institutional delivery, with considerable geographic variation. In the North region, 39.4% had a birth outside a health facility, while in the South region, this proportion was 4.9%,

almost five times the national average (Figure 1, Supplementary Table 1). Since Indigenous women concentrated most non-institutional deliveries, we focused the subsequent analysis on this group. The tabulations for all ethnic groups are provided in the Supplementary Material.

When we evaluated the intersection between ethnicity/skin color, region of residence, and age, the highest proportion (44.6%) of non-institution delivery was found among Indigenous women in the North region aged 35 years or more. However, the association of non-institutional deliveries with age varied by region. The Northeast, South, and Midwest regions showed similar proportions across age groups. In the North region, the proportion increased with age, while it decreased in the Southeast (Figure 2, Supplementary Table 2).

Non-institutional delivery showed a more pronounced and consistent pattern with education than age. There was a marked reduction in non-institutional births as schooling increased in all regions. In the Northeast, the proportion was nearly 10 times higher among those with four or fewer years of education than those with 12 years or more (21.9% and 2.0%, respectively) (Figure 2, Supplementary Table 3).

Next, we analyzed the proportion of the birth attendant professional categories by institutional delivery and region (Figure 3). In health facilities, mothers were primarily assisted by doctors and nurses/midwives. Still, 4.8% and 1.7% of Indigenous women were assisted by a TBA in the North and Northeast regions, respectively. Among non-institutional deliveries, a much higher proportion were assisted by non-skilled TBAs and others. TBAs proportions were 66.7% in the Southeast, 66.3% in the Midwest, 61.6% in the Northeast, 53.7% in the South, and 51.6% in the North. In the North, 43.0% of the deliveries were attended by others (Figure 3, Supplementary Table 4)

Women with non-institutional deliveries were attended mainly by non-skilled TBAs and other professionals regardless of their schooling. Still, there was a clear increase in skilled attendance with higher schooling. In the group with 12 or more years of education, the proportion of doctors and nurses/midwives attending births was 16.8%, decreasing to 7.9% and 4.8% in the groups with 4-11 and less than 4 years of education (Figure 4, Supplementary Table 5).

In terms of age, we observed a few differences. Among Indigenous women with non-institutional deliveries, the proportion attended by TBAs was similar among those aged <20 and 20–34 (53.9% and 54.0%, respectively), but slightly lower among women

aged ≥35 (50.1%). Conversely, the proportion of deliveries attended by others was higher in the oldest age group (43.5%) (Supplementary Table 6).

Discussion

Our findings showed that the prevalence of non-institutional deliveries in Brazil was 1.0% in 2018-2022. The distribution of non-institutional deliveries varied widely across geographic groups and skin color/ethnicity. High proportions were observed among Indigenous women, particularly in the North region, with nearly 40% of births outside health facilities. Among Indigenous women, higher proportions of non-institutional deliveries were observed in specific groups, such as those with low maternal education, mothers aged 35 or older in the North region, and adolescent mothers in the Southeast region. Higher proportions of births attended by TBAs were observed among non-institutional deliveries.

Ethnic disparities are highlighted in this study, mainly due to the high proportion of Indigenous women who had non-institutional deliveries. These disparities in non-institutional deliveries have direct implications for maternal and neonatal health outcomes. In literature, non-institutional deliveries have been associated with higher maternal and neonatal mortality due to the lack of availability of emergency obstetric care and skilled care (16). The disproportionately high prevalence of non-institutional deliveries among Indigenous women raises concerns about the increased risks of complications and adverse outcomes in these populations. This concern is relevant given that Indigenous women had higher maternal mortality rates (115.1/100,000 live births) than non-indigenous women (66.9/100,000 live births) in Brazil from 2015 to 2021, primarily due to hemorrhagic causes – one of the leading yet preventable causes of maternal death (17).

As of recent estimates, Indigenous peoples comprise only 0.8% of Brazil's population (203,080,756 million), with 26% being women of reproductive age (15–49 years) (18). Historically, Indigenous populations in Brazil have faced high levels of poverty, discrimination, and marginalization, primarily due to the lack of recognition of their cultural and identity differences (19). In the case of Indigenous women, these challenges are further compounded by the intersection of gender and ethnicity, whose barriers, prejudices, and violence occur not only because they belong to an ethnically

different group but also because they experience a patriarchal society (19,20). Moreover, other forms of social inequality remain prevalent in the country.

In this study, the intersection of ethnicity, geographic region, age, and education revealed the multiple overlapping barriers Indigenous women face in accessing maternity care. The geographic distribution of non-institutional deliveries demonstrated significant regional disparities, with the highest prevalence in the North and the lowest in the South. The higher proportion of non-institutional deliveries among Indigenous women in the North may be partially explained by the fact that this region houses 44.5% of the country's Indigenous population (18). However, this pattern may also reflect Brazil's unequal historical, political, and economic development (21), which has influenced the process of spatial occupation, characterizing the North region by demographic “voids” and low population density (22), as well as establishing the distribution of health services, which are highly concentrated in the South and Southeast regions (21).

As a result, the North region features sparsely populated territories that are difficult to access and lack adequate road infrastructure, which limits mobility and hampers economic development. River dynamics play a critical role in shaping daily life in water-rich areas, as transportation depends heavily on boats and seasonal variations. Periods of low river levels often lead to the isolation of communities, disrupting access to essential goods and services (22). Furthermore, most health services are concentrated in larger municipalities and urban centers, which are geographically distant from most of the population. In remote areas, health services, when available, face persistent challenges such as difficulties in retaining qualified health professionals, insufficient training opportunities, and a chronic lack of supplies and infrastructure (23).

Consequently, Indigenous women encounter multiple structural barriers, including the unequal distribution of health facilities, such as the absence of nearby healthcare services or adequate infrastructure, long distances to maternity, and logistical challenges in remote areas, such as limited or absent transportation options and financial barriers (20). Additionally, a lack of awareness among healthcare professionals regarding these challenges further exacerbates the issue. For instance, a study in rural Mexico showed that the distances Indigenous women had to travel were often overlooked by medical staff, leading to situations where women were sent home late at night because they were not yet in active labor. As a result, several women gave birth on the way home, sometimes on the side of the road (24).

Education played a decisive role in the prevalence of non-institutional deliveries. In all regions, Indigenous women with lower educational levels had substantially higher proportions of births occurring outside of health facilities. Lower levels of education may reflect broader vulnerabilities experienced by Indigenous communities, including high levels of poverty and limited access to formal education, as well as structural inequalities that restrict women's autonomy in health decisions (19,25). Furthermore, educational challenges may be linked to the language barriers that permeate Indigenous healthcare, compromising information sharing and trust between professionals and Indigenous women (20).

Maternal age also influenced the prevalence of non-institutional deliveries among Indigenous women, although the pattern varied by region. In the North, older Indigenous women had a higher prevalence of non-institutional births, whereas in the Southeast, younger women were more likely to give birth in health facilities. In other regions, the proportion of non-institutional deliveries remained stable. These variations suggest that region-specific factors, such as health infrastructure, cultural norms around childbirth, and historical interactions between Indigenous communities and institutional health services, may shape age-related disparities in birth experiences among Indigenous women (11).

The North region, for example, has been less influenced by urbanization, and healthcare infrastructure is still under development (22). Consequently, older women have historically had limited access to hospital-based childbirth, reinforcing the tradition of home births. However, the expansion of public health policies, such as the SUS and the Indigenous Health Subsystem, has led to a notable increase in hospital births among younger generations, reflecting a gradual shift in care practices (26). In contrast, the Southeast region presents an opposite pattern. Among younger Indigenous women, there is an emerging trend toward the revival of traditional home birth practices. This phenomenon may be interpreted as an effort to reaffirm cultural identity in response to the region's widespread medicalization and institutionalization of childbirth (27).

While institutional births were predominantly attended by qualified professionals, such as doctors and nurses/midwives, non-institutional births were primarily attended by TBAs and other unqualified people, mainly in the North region. The reliance on TBAs in Indigenous communities reflects both cultural continuity and systemic gaps in healthcare access. In Brazil, although the SUS organizes services in villages through the Special Indigenous Health District (DSEI), which should guarantee the right to antenatal,

childbirth, and postpartum care, there are no legal provisions or health policies that adequately address the social, cultural, and geographic diversity of Indigenous women's pregnancy and postpartum experiences (28).

In many Indigenous communities, home births attended by TBAs are deeply rooted in ancestral knowledge and cultural identity. In general, TBAs are older women from the same locality who speak the same language, are accessible, affordable, and know cultural practices and preferences (29,30). However, few have any training (31). A study conducted with *Munduruku* TBAs in Amazonas, North Brazil, reported that assisting births was regarded as a gift and that no formal training was necessary to legitimize the role and actions of TBAs (30).

Other cultural preferences during and after childbirth that are not permitted in health facilities may contribute to Indigenous women's reluctance to seek hospital care. These preferences include family presence during childbirth, the use of herbs and teas, and preferred birthing positions (20,30,32). The birthing position is a particularly significant cultural aspect. Common positions among Indigenous women include kneeling with hands resting on a hammock, sitting partially or entirely on the floor while being supported from behind, or sitting on a stool (30). An integrative review identified studies showing that health facilities often do not accommodate these preferred positions, and Indigenous women are not given explanations as to why they must give birth in the lying position (32).

Furthermore, structural challenges within the health system further discourage Indigenous women from giving birth in hospitals. These challenges include mistreatment, discrimination, and invasive behaviors by healthcare staff, such as performing vaginal examinations and removing clothing without consent, all of which contribute to fear and distrust in health facilities (6,20,24). Gender dynamics also act as a barrier, particularly when the doctors are men, as some husbands do not consent to their partners being examined by male doctors (32).

Recognizing the role of TBAs in Indigenous birth care, Brazil launched the Working with TBAs Program in 2000 to enhance the training and integration into the formal health system. However, the program's reach remains limited, and many TBAs continue to operate without adequate institutional support (29). Notably, although non-institutional deliveries were relatively rare among white women (Supplementary Figure 3), they were more likely to be attended by qualified professionals when they did occur.

This disparity underscores inequalities in access to institutional birth and the quality of care provided outside of health facilities.

Initiatives such as the "*Rede Cegonha*," launched in 2011 and restructured in 2024 as the "*Rede Alyne*," have aimed to address regional, socioeconomic, and ethnic inequalities by promoting actions that ensure humane and equitable care (33). However, additional strategies are needed to expand access to health services and reduce preventable maternal and neonatal deaths among Indigenous women.

Our study has some limitations. Although SINASC covers nearly all births in the country, data may be affected by omissions and errors in the live birth registration (DNV) records (34). Additionally, our estimates may be affected by underreporting; IBGE estimates that in 2019, the percentage of underreporting of home births was 8.3%, while hospital births was 0.7%. Moreover, underreporting varies across regions and contexts (35). If underreporting were reduced in certain areas, the prevalence of non-institutional deliveries could be higher than currently observed, further highlighting existing inequalities. Our analysis also does not include legal or clandestine abortions or stillbirths for which the DNV does not apply.

Our analyses generalized the results to all Indigenous women without accounting for the diversity of ethnic Indigenous groups in Brazil. Furthermore, we did not differentiate between planned home births and accidental home births. No questions in the database allow this differentiation, representing a gap to be explored in future research. Despite these limitations, it is essential to acknowledge the strengths of SINASC, particularly its national coverage and its potential to inform policies for maternal and newborn care at all levels (34).

Overcoming the barriers that limit Indigenous women's access to adequate maternal care requires strategies that directly address the structural inequalities highlighted in this study. Expanding access to institutional deliveries is critical, particularly in remote areas where healthcare infrastructure and coverage remain limited. This expansion must be accompanied by the implementation of culturally respectful services that acknowledge and integrate Indigenous traditions and preferences. For situations where institutional deliveries are not feasible or preferred, strengthening programs for culturally sensitive and qualified home birth assistance is essential. These programs should ensure the availability of skilled professionals to attend home deliveries while also guaranteeing rapid access to emergency services when necessary.

Our findings underscore the importance of adopting an intersectional approach to maternal healthcare. This perspective reveals how ethnic, socioeconomic, and geographic factors intersect to exacerbate barriers faced by Indigenous women, particularly in accessing institutional health services. Addressing these overlapping inequalities is fundamental to ensuring equitable and respectful care for all women—including those in the most marginalized groups. No one should be left behind in efforts to improve maternal health outcomes. Empowering Indigenous women through access to health education and information is crucial to enabling them to fully exercise their reproductive rights and make informed decisions about their maternal health.

References

1. Patah LEM, Malik AM. Modelos de assistência ao parto e taxa de cesárea em diferentes países. Rev Saude Publica. 2011 Feb;45(1):185–94.

2. Janssen PA, Lee SK, Ryan EM, Etches DJ, Farquharson DF, Peacock D, et al. Outcomes of planned home births versus planned hospital births after regulation of midwifery in British Columbia. CMAJ. 2002 Feb 5;166(3):315–23.

3. TabNet Win32 3.3: Nascidos vivos - Brasil [Internet]. [cited 2025 Feb 4]. Available from: http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sinasc/cnv/nvuf.def

4. Maia MB. Assistência à saúde e ao parto no Brasil. In: Humanização do parto: política pública, comportamento organizacional e ethos profissional. Rio de Janeiro: Fiocruz; 2020. p. 19–49.

5. Victora CG, Aquino EML, do Carmo Leal M, Monteiro CA, Barros FC, Szwarcwald CL. Maternal and child health in Brazil: progress and challenges. Lancet. 2011 May 28;377(9780):1863–76.

6. Bohren MA, Vogel JP, Hunter EC, Lutsiv O, Makh SK, Souza JP, et al. The Mistreatment of Women during Childbirth in Health Facilities Globally: A Mixed-Methods Systematic Review. PLoS Med. 2015;12(6):e1001847; discussion e1001847.

7. Pesquisa Nacional Sobre Saude Materno-Infantil e Planejamento Familiar - Brasil 1986 [Internet]. 1986 [cited 2025 Feb 4]. Available from: https://dhsprogram.com/pubs/pdf/FR4/FR4.pdf

8. Joseph G, da Silva IC, Wehrmeister FC, Barros AJ, Victora CG. Inequalities in the coverage of place of delivery and skilled birth attendance: analyses of cross-sectional surveys in 80 low and middle-income countries. Reprod Health. 2016;13(1):77.

9. Pesquisa Nacional de Demografia e Saúde da Criança e da Mulher [Internet]. 2006 [cited 2025 Feb 4]. Available from: https://bvsms.saude.gov.br/bvs/pnds/img/relatorio_final_PNDS2006_04julho2008.pdf

10. Mendoza-Chuctaya G, Montesinos-Segura R, Agramonte-Vilca M. Características y Prevalencia de Partos Domiciliarios en un distrito Rural de la Sierra del Perú, 2015-2016 [Internet]. [cited 2025 Feb 4]. Available from: https://www.scielo.cl/pdf/rchog/v83n4/0717-7526-rchog-83-04-0377.pdf

11. Moliterno ACM, Borghi AC, Orlandi LH de SF, Faustino RC, Serafim D, Carreira L. Processo de gestar e parir entre as mulheres Kaingang. Texto Contexto Enferm. 2013 Jun;22(2):293–301.

12. Cursino TP, Benincasa M. Parto domiciliar planejado no Brasil: uma revisão sistemática nacional. Cien Saude Colet. 2020 Mar 6;25(4):1433–44.

13. La Cruz F. Parteiras, enfermeiras obstétricas e obstetrizes: e a qualificação da atenção ao parto no Brasil desde o século XIX. Fundo de População das Nações Unidas; 2023.

14. Silva ZP da, Almeida MF de, Alencar GP. Parto acidental não-hospitalar como indicador de risco para a mortalidade infantil. Rev Bras Saúde Materno Infant. 2014 Apr;14(2):155–64.

15. Ministério da Saúde. DECLARAÇÃO DE NASCIDO VIVO. Manual de Instruções para Preenchimento. 2022;

16. Boerma T, Campbell OMR, Amouzou A, Blumenberg C, Blencowe H, Moran A, et al. Maternal mortality, stillbirths, and neonatal mortality: a transition model based on analyses of 151 countries. Lancet Glob Health. 2023;11(7):e1024–31.

17. Lopes Garrafa J, Dantas-Silva A, Garanhani Surita F, de Siqueira Guida JP, Bhadra Vale D, de Campos Brandão M, et al. Maternal deaths among Brazilian indigenous women-Analysis from 2015 to 2021. Int J Gynaecol Obstet. 2024 Nov;167(2):612–8.

18. Instituto Brasileiro de Geografia e Estatística. Panorama do Censo 2022. [cited 2025 Mar 11]. Panorama do Censo 2022. Available from: https://censo2022.ibge.gov.br/panorama/indicadores.html?localidade=BR

19. Almeida JR de, Angelin R, Veronese O. Identidade, diferença e reconhecimento: um olhar sobre os movimentos de mulheres indígenas no Brasil e a pauta de enfrentamento à violência de gênero. Rev Direito Práx. 2023 Jun 19;14(2):915–39.

20. Morgan J, M Breau G. Access to maternal health services for Indigenous women in low- and middle-income countries: an updated integrative review of the literature from 2018 to 2023. Rural Remote Health. 2024 May;24(2):8520.

21. Albuquerque MV de, Viana ALD, Lima LD de, Ferreira MP, Fusaro ER, Iozzi FL. Desigualdades regionais na saúde: mudanças observadas no Brasil de 2000 a 2016. Cien Saude Colet. 2017 Apr;22(4):1055–64.

22. Bousquat A, Fausto MCR, Almeida PF de, Lima JG, Seidl H, Sousa ABL, et al. Remoto ou remotos: a saúde e o uso do território nos municípios rurais brasileiros. Rev Saude Publica. 2022 Aug 8;56:73.

23. Lima JG, Giovanella L, Fausto MCR, Mendonça MHM de. Organização da Atenção Primária à Saúde em Municípios Rurais Remotos do Oeste do Pará. Saúde em Debate. 2023 Oct 17;47(139):858–77.

24. Sacks E, Mendez Alvarez M, Bancalari P, Alegre JC. Traditions and trust: a qualitative study of barriers to facility-based obstetric and immediate neonatal care in Chiapas, Mexico. Women Health. 2022 Jul;62(6):522–31.

25. Sacchi A. Mulheres indígenas e participação política: a discussão de gênero nas organizações de mulheres indígenas [Internet]. 2003 [cited 2025 Mar 11]. Available from: https://periodicos.ufpe.br/revistas/index.php/revistaanthropologicas/article/view/23601/19256

26. Dias-Scopel RP, Scopel D. Promoção da saúde da mulher indígena: contribuição da etnografia das práticas de autoatenção entre os Munduruku do Estado do Amazonas, Brasil. Cad Saude Publica. 2019 Aug 19;35Suppl 3(Suppl 3):e00085918.

27. Prates MP. Birthing, corporality and care among the Guarani-Mbyá of southern Brazil. Vibrant (Brasilia) [Internet]. 2021;18. Available from: http://dx.doi.org/10.1590/1809-43412021v18a501

28. Boer L, Haeffner LSB, Boer N, Halberstadt BMK, de Lima Ferreira CL, Backes DS. Políticas assistenciais do ciclo gravídico-puerperal de mulheres indígenas: perspectiva de gestores de serviços da saúde indígena. Cien Saude Colet [Internet]. 2024; Available from: https://cienciaesaudecoletiva.com.br/artigos/politicas-assistenciais-do-ciclo-gravidicopuerperal-de-mulheres-indigenas-perspectiva-de-gestores-de-servicos-da-saude-indigena/19388?id=19388

29. Costa GDF, Pimentel C, Schweickardt JC. Perfil das parteiras tradicionais do Amazonas: relações do partejar entre serviços de saúde e participação política. Physis. 2023 Sep 8;33:e33023.

30. Dias-Scopel RP, Scopel D. ¿Quiénes son las parteras munduruku? Pluralismo médico y autoatención en el parto domiciliario entre indígenas en Amazonas, Brasil. Desacatos Revista de Ciencias Sociales. 2018 Sep 5;(58):16–33.

31. Garces A, McClure EM, Espinoza L, Saleem S, Figueroa L, Bucher S, et al. Traditional birth attendants and birth outcomes in low-middle income countries: A review. Semin Perinatol. 2019;43(5):247–51.

32. Akter S, Davies K, Rich JL, Inder KJ. Indigenous women's access to maternal healthcare services in lower- and middle-income countries: a systematic integrative review. Int J Public Health. 2019 Apr;64(3):343–53.

33. Portaria GM/MS Nº 5.350, DE 12 de setembro de 2024. *Altera a Portaria de Consolidação GM/MS nº 3, de 28 de setembro de 2017, para dispor sobre a Rede Alyne.* [Internet]. Ministério da Saúde. Available from: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2024/prt5350_13_09_2024.html

34. Szwarcwald CL, Leal M do C, Esteves-Pereira AP, Almeida W da S de, Frias PG de, Damacena GN, et al. Avaliação das informações do Sistema de Informações sobre

Nascidos Vivos (SINASC), Brasil. Cad Saude Publica. 2019 Oct 7;35(10):e00214918.

35. Aplicação da Técnica de Captura-Recaptura: Estimativas desagregadas dos totais de nascidos vivos e óbitos [Internet]. Instituto Brasileiro de Geografia e Estatística; 2022 [cited 2025 Feb 19]. Available from: https://biblioteca.ibge.gov.br/visualizacao/livros/liv101978.pdf

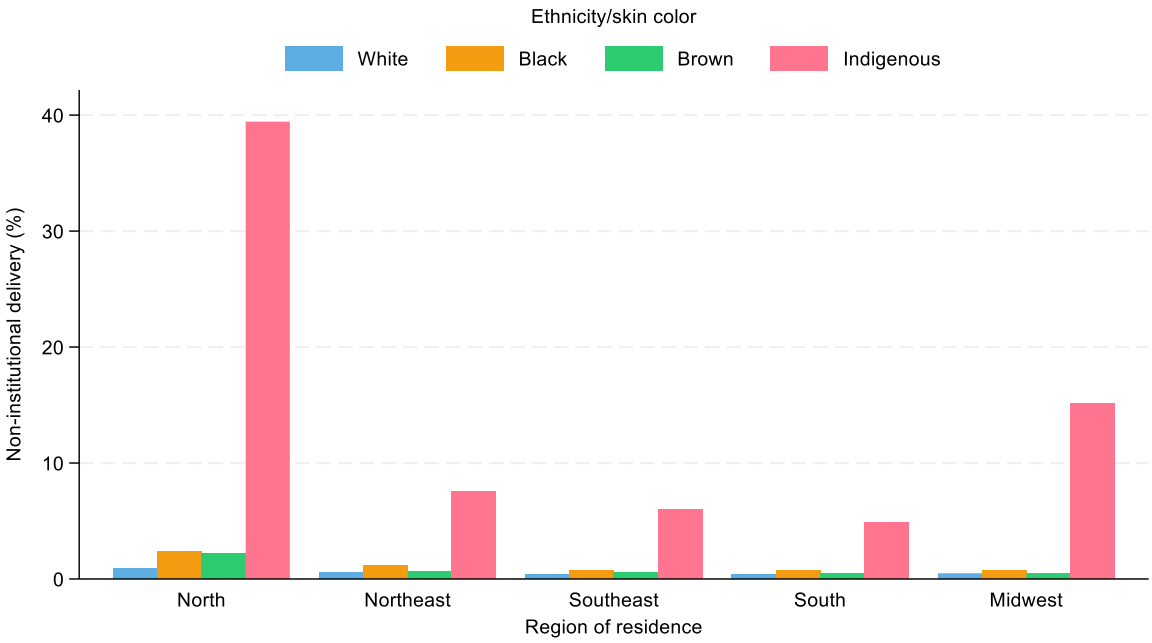


Figure 1 - Prevalence of non-institutional delivery by region of residence and ethnicity/skin color, SINASC Brazil (2018-2022)

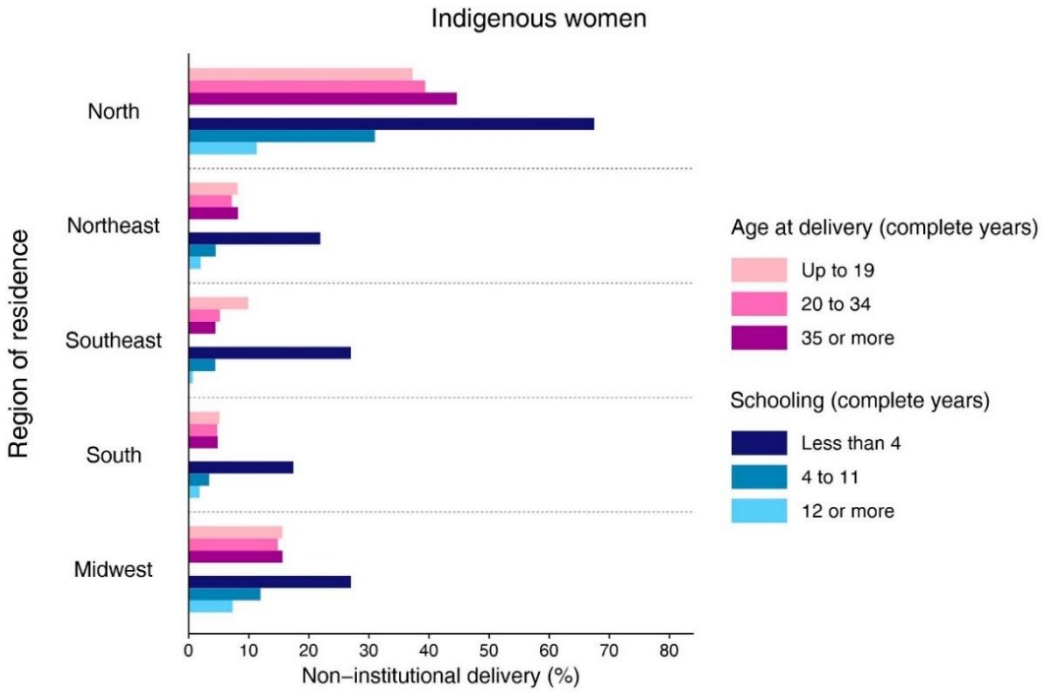


Figure 2 - Prevalence of non-institutional delivery among Indigenous women by region of residence, age at delivery, and schooling, SINASC Brazil (2018-2022)

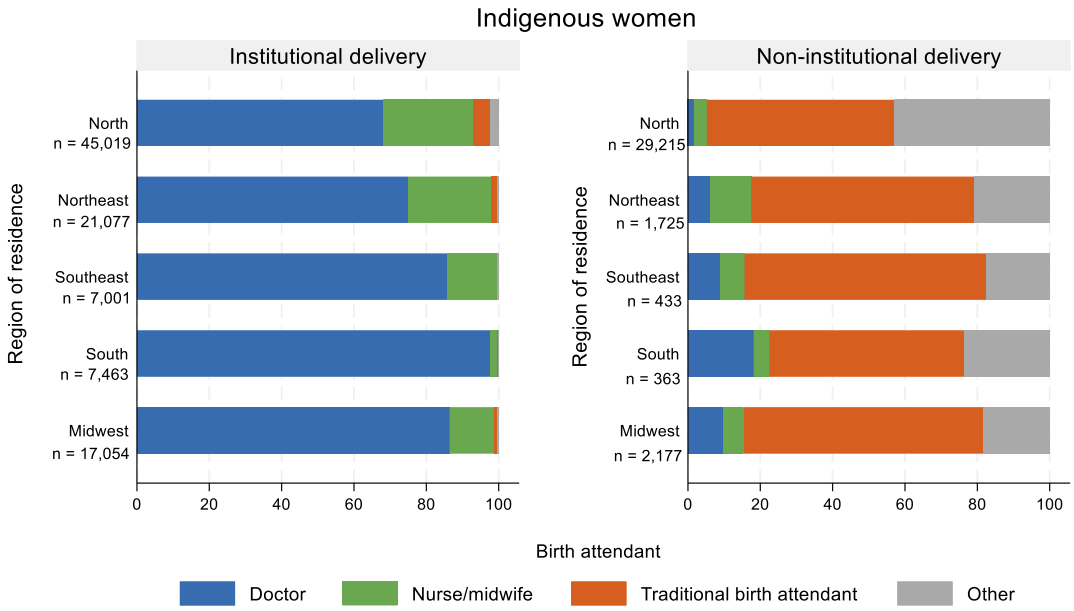


Figure 3 - Proportion of birth attendants among Indigenous women who had institutional and non-institutional deliveries by region of residence, SINASC Brazil (2018-2022).

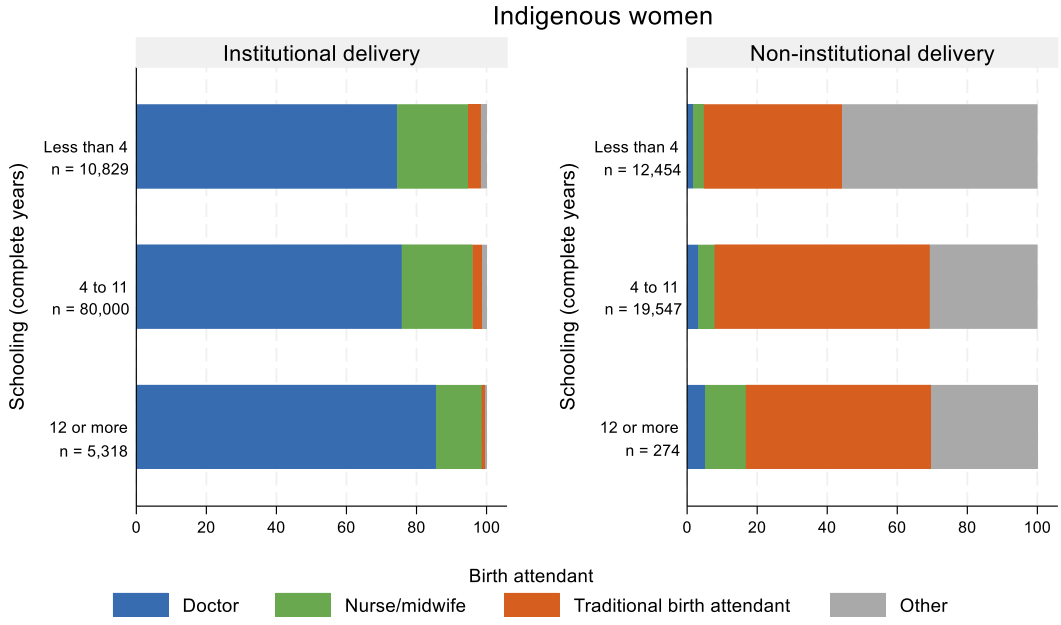


Figure 4 - Proportion of birth attendants among Indigenous women who had institutional and non-institutional deliveries by schooling, SINASC Brazil (2018-2022).

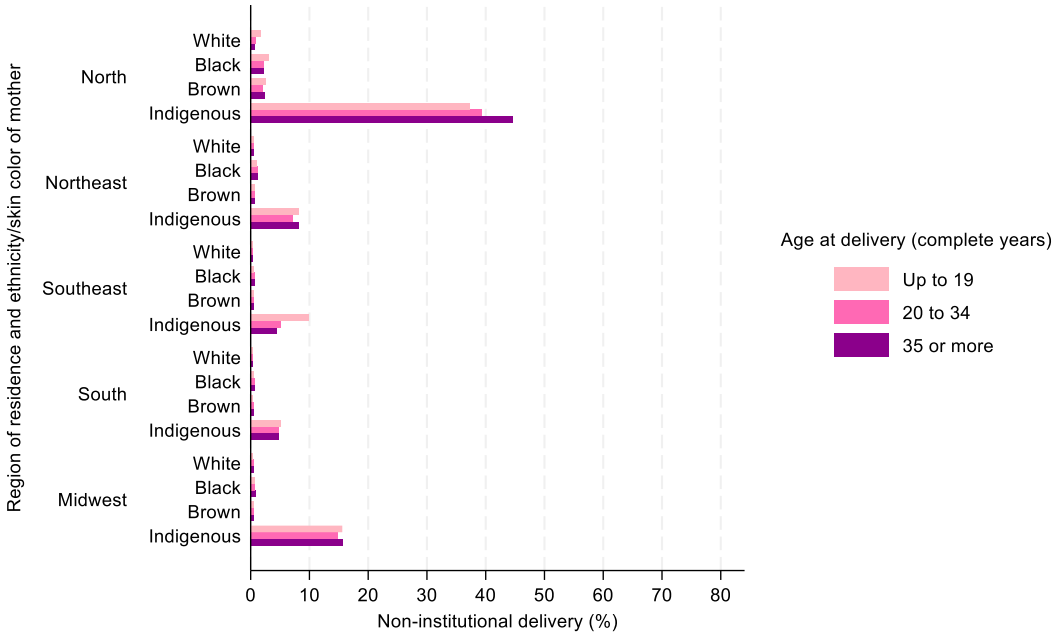
Table 1 - Description and proportion of non-institutional deliveries from 2018 to 2022 by individual and contextual characteristics of mothers, SINASC Brazil.

	Description of the characteristics of parturient		**Non-institutional delivery (N= 135,221)**
Variables	**N**	**%**	**%**
Pooled prevalence (2018-2022)	**13,762,655**	**100.0**	**1.0**
Annual prevalence			
2018	2,944,840	21.4	0.9
2019	2,849,922	20.7	0.9
2020	2,729,972	19.8	1.0
2021	2,677,001	19.5	1.1
2022	2,561,830	18.6	1.0
Region of residence			
Midwest	1,170,819	8.5	0.8
Northeast	3,887,728	28.3	0.7
North	1,532,944	11.1	4.0
Southeast	5,291,621	38.5	0.5
South	1,879,543	13.7	0.5
Ethnicity/skin color*			
White	4,604,621	34.5	0.5
Black	891,679	6.7	0.9
Brown	7,708,716	57.8	0.9
Indigenous	134,617	1.0	26.3
**Age at delivery (complete years) ** **			
Up to 19	1,937,275	14.1	1.4
20 to 34	9,555,331	69.4	0.9
35 or more	2,269,792	16.5	0.8
Schooling * **			
Less than 4 years	257,495	1.9	8.3
4 to 11 years	10,357,578	76.1	0.9
12 years or more	2,988,481	22.0	0.5
Birth attendant** **			
Doctor	12,075,975	88.5	NA
Nurse/midwife	1,406,472	10.3	NA
Traditional birth attendant (TBA)	74,505	0.6	NA
Other	78,102	0.6	NA

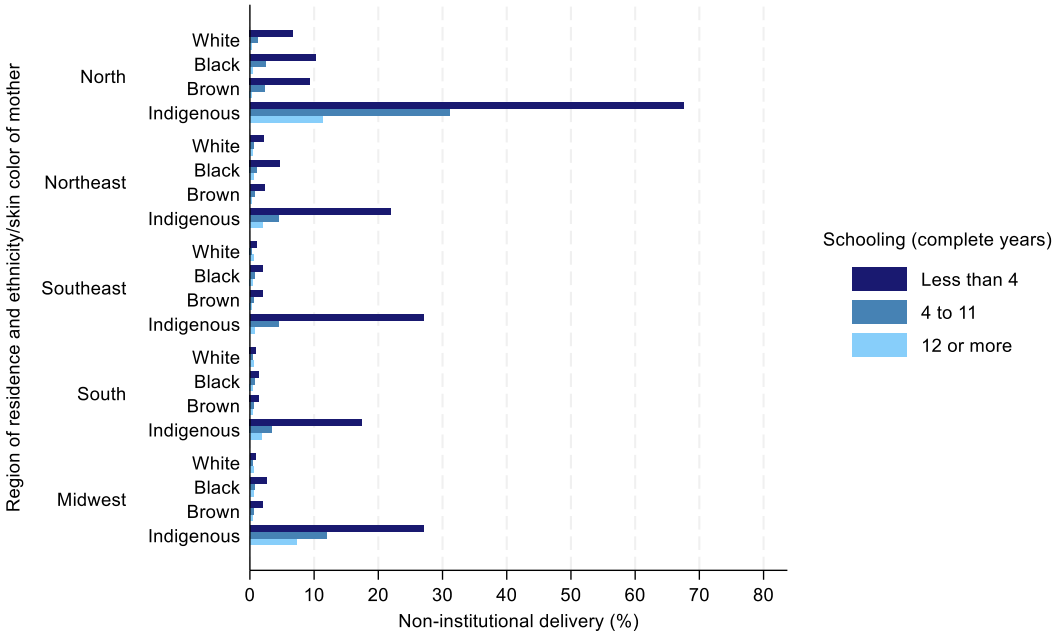
*2.6% of missing values
**<0.01% of missing values
***1.2% of missing values
****0.86% of missing values
NA: Not applicable

Supplementary materials

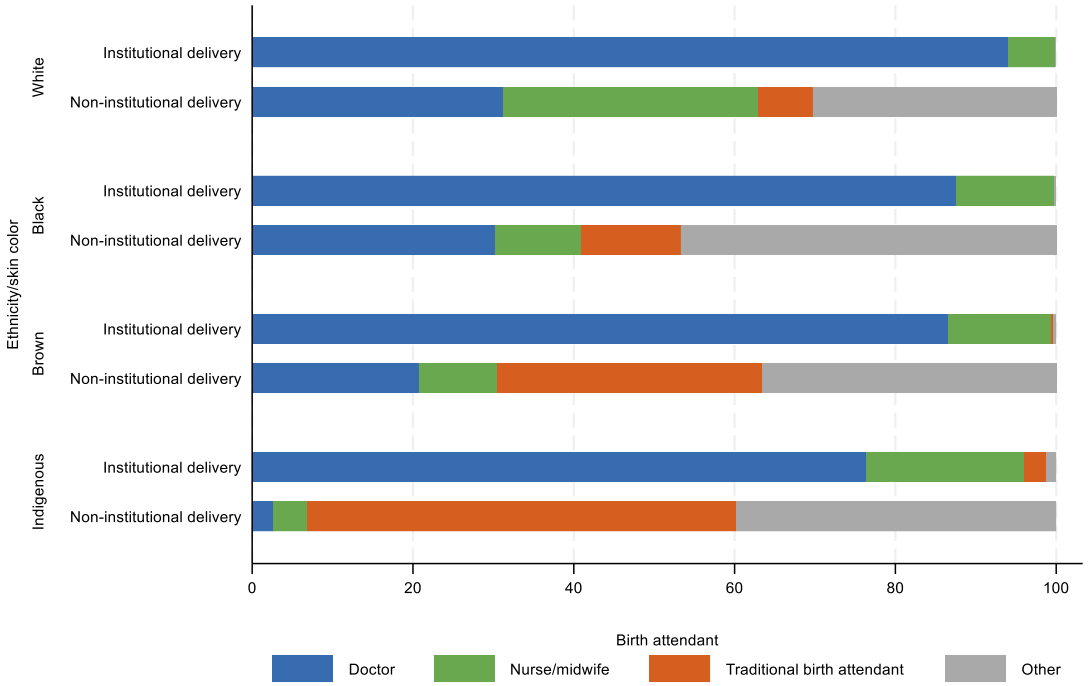
Supplementary Figure 1 - Prevalence of non-institutional delivery by region of residence, ethnicity/skin color, and age at delivery, SINASC Brazil (2018-2022)



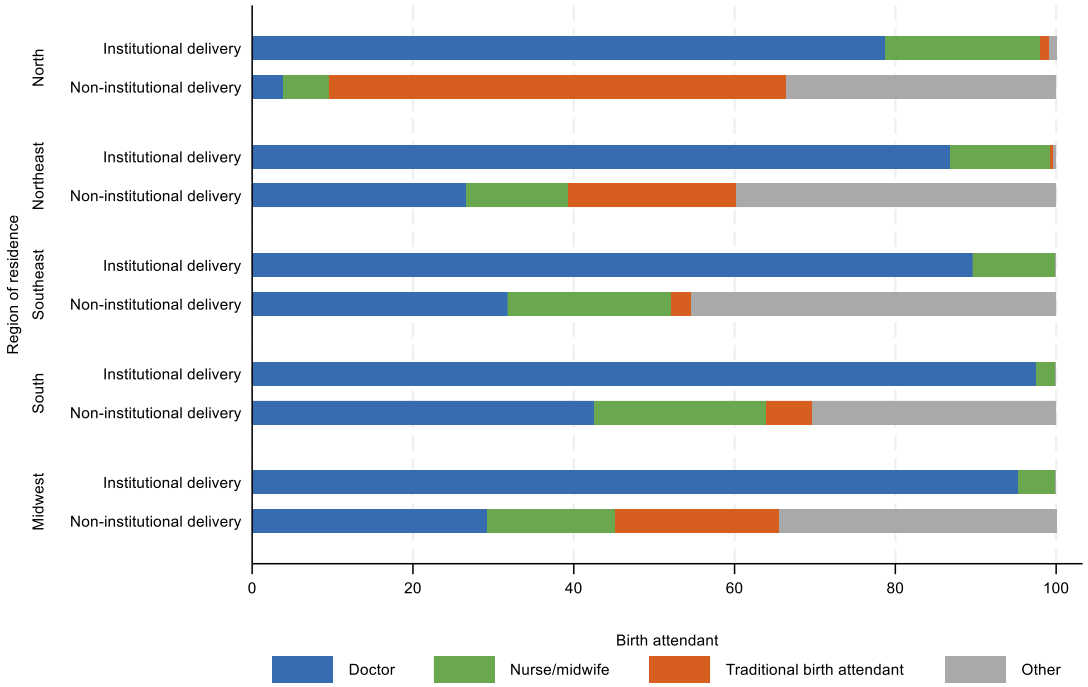
Supplementary Figure 2 - Prevalence of non-institutional delivery by region of residence, ethnicity/skin color, and schooling, SINASC Brazil (2018-2022)



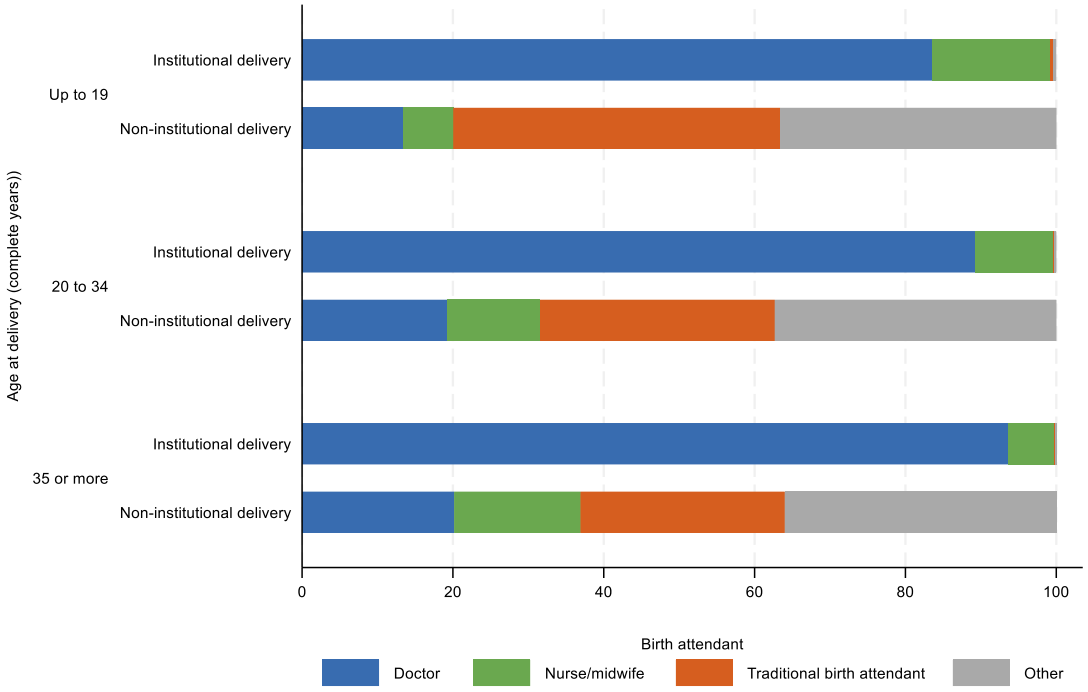
Supplementary Figure 3 - Proportion of birth attendants among women who had institutional and non-institutional deliveries by region of residence, SINASC Brazil (2018-2022).



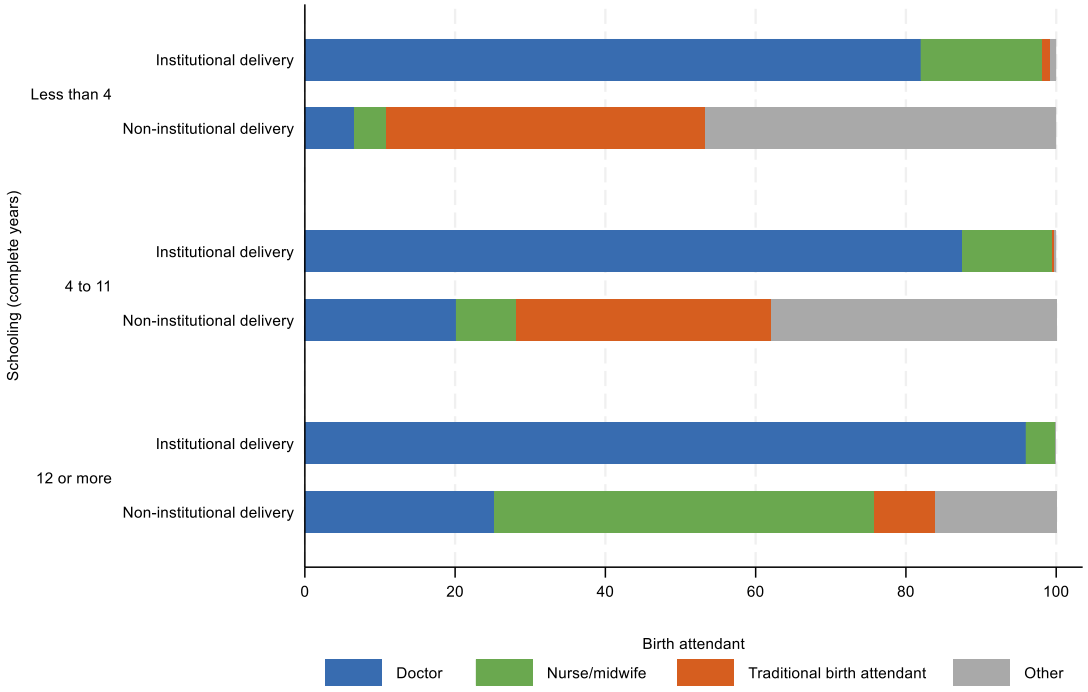
Supplementary Figure 4- Proportion of birth attendants among women who had institutional and non-institutional deliveries by ethnicity/skin color, SINASC Brazil (2018-2022).



Supplementary Figure 5 - Proportion of birth attendants among women who had institutional and non-institutional deliveries by age at delivery, SINASC Brazil (2018-2022).



Supplementary Figure 6 - Proportion of birth attendants among women who had institutional and non-institutional deliveries by schooling, SINASC Brazil (2018-2022).



Supplementary Table 1 – Description of the total sample and of the prevalence of non-institutional delivery by region of residence and ethnicity/skin color, SINASC Brazil (2018-2022)

	Total N and % non-institutional deliveries			
	Ethnicity/skin color			
Region of residence	**White**	**Black**	**Brown**	**Indigenous**
North	117,805 (0.9)	40,788 (2.4)	1,276,393 (2.2)	74,940 (39.4)
Northeast	426,290 (0.5)	229,049 (1.2)	2,984,984 (0.7)	23,239 (7.5)
Southeast	2,297,506 (0.4)	468,682 (0.7)	2,429,394 (0.5)	7,456 (6.0)
South	1,452,182 (0.4)	91,126 (0.7)	308,954 (0.5)	7,868 (4.9)
Midwest	310,838 (0.5)	62,034 (0.8)	708,991 (0.5)	21,114 (15.2)

Supplementary Table 2 – Description of the total sample and of the prevalence of non-institutional delivery by region of residence, ethnicity/skin color, and age at delivery, SINASC Brazil (2018-2022)

		Total N and % non-institutional deliveries		
		Age at delivery (complete years)		
Region of residence	**Ethnicity/skin color**	**Up to 19**	**20 to 34**	**35 or more**
North	White	16,515 (1.7)	82,167 (0.8)	19,123 (0.7)
	Black	7,215 (3.0)	28,312 (2.2)	5,261 (2.2)
	Brown	279,658 (2.6)	862,952 (2.1)	133,781 (2.4)
	Indigenous	22,198 (37.2)	44,555 (39.4)	8,008 (44.6)
Northeast	White	50,775 (0.6)	291,289 (0.5)	84,226 (1.1)
	Black	34,542 (1.1)	157,483 (1.2)	37,024 (1.2)
	Brown	540,141 (0.7)	2,047,193 (0.7)	397,649 (0.7)
	Indigenous	6,160 (8.1)	14,553 (7.2)	2,525 (8.1)
Southeast	White	191,045 (0.3)	1,579,372 (0.4)	527,087 (0.4)
	Black	56,516 (0.6)	333,093 (0.8)	79,073 (0.7)
	Brown	325,969 (0.5)	1,715,542 (0.6)	387,880 (0.5)
	Indigenous	1,363 (9.9)	5,080 (5.2)	1,013 (4.4)
South	White	142,062 (0.4)	1,029,508 (0.4)	280,610 (0.4)
	Black	9,409 (0.5)	66,189 (0.8)	15,528 (0.8)
	Brown	45,506 (0.4)	220,411 (0.5)	43,037 (0.6)
	Indigenous	2,146 (5.1)	4,914 (4.8)	808 (4.8)
Midwest	White	29,218 (0.4)	217,623 (0.5)	63,993 (0.6)
	Black	7,833 (0.8)	44,566 (0.7)	9,635 (0.9)
	Brown	106,816 (0.5)	505,961 (0.5)	96,212 (0.5)
	Indigenous	6,631 (15.6)	12,557 (14.8)	1,922 (15.6)

Supplementary Table 3 – Description of the total sample and of the prevalence of non-institutional delivery by region of residence, ethnicity/skin color, and schooling, SINASC Brazil (2018-2022)

		Total N and % non-institutional deliveries		
		Schooling (complete years)		
Region of residence	**Ethnicity/skin color**	**Less than 4**	**4 to 11**	**12 or more**
North	White	1,625 (6.7)	69,075 (1.2)	46,123 (0.3)
	Black	1,510 (10.3)	31,907 (2.4)	6,953 (0.4)
	Brown	44,256 (9.4)	1,045,155 (2.2)	160,469 (0.3)
	Indigenous	16,629 (67.6)	55,079 (31.0)	1,932 (11.3)
Northeast	White	6,943 (2.1)	263,671 (0.5)	151,785 (0.5)
	Black	7,299 (4.7)	187,218 (1.1)	31,687 (0.6)
	Brown	94,903 (2.2)	2,476,927 (0.7)	355,370 (0.3)
	Indigenous	2,995 (21.9)	17,923 (4.5)	1,558 (0.3)
Southeast	White	10,143 (1.0)	1,406,058 (0.3)	873,862 (0.5)
	Black	6,018 (1.9)	388,442 (0.8)	71,922 (0.5)
	Brown	24,741 (1.9)	2,033,313 (0.6)	356,213 (0.3)
	Indigenous	600 (27.0)	5,869 (4.4)	901 (0.7)
South	White	10,379 (0.9)	973,986 (0.4)	462,430 (0.5)
	Black	2,026 (1.3)	77,193 (0.7)	11,221 (0.5)
	Brown	5,270 (1.4)	264,587 (0.5)	38,044 (0.5)
	Indigenous	705 (17.4)	6,624 (3.4)	442 (1.8)
Midwest	White	1,499 (0.9)	158,083 (0.4)	150,377 (0.6)
	Black	908 (2.6)	47,835 (0.7)	13,027 (0.5)
	Brown	7,633 (2.0)	549,482 (0.5)	149,410 (0.3)
	Indigenous	3,379 (27.0)	15,871 (12.0)	1,079 (7.3)

Supplementary Table 4 – Description of the sample size and proportion of birth attendants among Indigenous women who had institutional and non-institutional deliveries by region of residence, SINASC Brazil (2018-2022).

	Birth attendant N (%)			
Place of delivery and region of residence	**Doctor**	**Nurse/midwife**	**TBA**	**Other**
Institutional delivery				
North	30,695 (68.2)	11,154 (24.8)	2,165 (4.8)	996 (2.2)
Northeast	15,794 (74.9)	4,837 (22.9)	366 (1.7)	80 (0.4)
Southeast	6,001 (85.7)	971 (13.9)	7 (0.1)	22 (0.3)
South	7,291 (97.7)	155 (2.1)	4 (0.1)	13 (0.2)
Midwest	14,748 (86.5)	2,091 (12.3)	154 (0.9)	61 (0.4)
Non-institutional delivery				
North	485 (1.7)	1,048 (3.6)	15,129 (51.8)	12,553 (43.0)
Northeast	106 (6.1)	196 (11.4)	1,063 (61.6)	360 (20.9)

Southeast	39 (9.0)	29 (6.7)	289 (66.7)	76 (17.6)
South	66 (18.2)	16 (4.4)	195 (53.7)	86 (23.7)
Midwest	214 (9.8)	120 (5.5)	1,444 (66.3)	399 (18.3)

TBA: traditional birth attendant

Supplementary Table 5 – Description of the sample size and proportion of birth attendants among Indigenous women who had institutional and non-institutional deliveries by schooling, SINASC Brazil (2018-2022).

	Birth attendant N (%)			
Place of delivery and schooling	**Doctor**	**Nurse/midwife**	**TBA**	**Other**
Institutional delivery				
Less than 4	8,068 (74.5)	2,195 (20.3)	392 (3.6)	174 (1.6)
4 to 11	60,651 (75.8)	16,185 (20.2)	2,209 (2.8)	955 (1.2)
12 or more	4,551 (85.6)	693 (13.0)	56 (1.1)	18 (0.3)
Non-institutional delivery				
Less than 4	230 (1.8)	367 (2.9)	4,917 (39.5)	6,940 (55.7)
4 to 11	636 (3.3)	903 (4.6)	12,010 (61.4)	5,998 (30.7)
12 or more	14 (5.1)	32 (11.7)	145 (52.9)	83 (30.3)

TBA: traditional birth attendant

Supplementary Table 6 – Description of the sample size and proportion of birth attendants among Indigenous women who had institutional and non-institutional deliveries by age at delivery, SINASC Brazil (2018-2022).

	Birth attendant N (%)			
Place of delivery and age	**Doctor**	**Nurse/midwife**	**TBA**	**Other**
Institutional delivery				
Up to 19	20,824 (74.7)	5,853 (21.0)	844 (3.0)	370 (1.3)
20 to 34	45,830 (76.7)	11,612 (19.4)	1,638 (2.7)	682 (1.1)
35 or more	7,875 (79.1)	1,742 (17.5)	214 (2.1)	120 (1.2)
Non-institutional delivery				
Up to 19	256 (2.7)	413 (4.3)	5,157 (53.9)	3,736 (39.1)
20 to 34	552 (2.7)	826 (4.1)	10,879 (54.0)	7,896 (39.2)
35 or more	98 (2.4)	159 (4.0)	2,017 (50.1)	1,748 (43.5)

TBA: traditional birth attendant

Supplementary Table 7 - Description of the proportion of birth attendants among women who had institutional and non-institutional deliveries by region of residence, ethnicity/skin color, age at delivery and schooling, SINASC Brazil (2018-2022).

Birth attendant	Institutional delivery				Non-institutional delivery			
	Doctor	Nurse /midwife	TBA	Other	Doctor	Nurse /midwife	TBA	Other
	%							
Region of residence								
North	78.7	19.3	1.1	0.9	3.9	5.7	56.9	33.5
Northeast	86.8	12.5	0.4	0.3	26.6	12.7	20.9	39.7
Southeast	89.6	10.3	0.01	0.07	31.8	20.4	2.5	45.4
South	97.5	2.4	0.03	0.05	42.6	21.4	5.7	30.3
Midwest	95.3	4.6	0.04	0.07	29.2	16.0	20.3	34.5
Ethnicity/ skin color								
White	94.1	5.8	0.06	0.07	31.3	31.6	6.8	30.3
Black	87.6	12.2	0.08	0.2	30.3	10.6	12.4	46.7
Brown	86.6	12.7	0.3	0.3	20.8	9.7	33.0	36.6
Indigenous	76.4	19.7	2.8	1.2	2.7	4.2	53.4	39.7
Age at delivery (complete years)								
Up to 19	83.6	15.5	0.5	0.4	13.4	6.7	43.3	36.6
20 to 34	89.3	10.2	0.2	0.2	19.3	12.2	31.1	37.3
35 or more	93.6	6.1	0.1	0.1	20.2	16.8	27.1	36.0
Schooling								
Less than 4 years	82.0	16.2	1.7	0.8	6.6	4.2	42.5	46.6
4 to 11 years	87.5	12.0	0.3	0.3	20.1	8.0	33.9	37.9
12 years or more	95.9	3.9	0.05	0.06	25.2	50.6	8.1	16.1

TBA: traditional birth attendant

This preprint was submitted under the following conditions:

- The authors declare that they are aware that they are solely responsible for the content of the preprint and that the deposit in SciELO Preprints does not mean any commitment on the part of SciELO, except its preservation and dissemination.
- The authors declare that the necessary Terms of Free and Informed Consent of participants or patients in the research were obtained and are described in the manuscript, when applicable.
- The authors declare that the preparation of the manuscript followed the ethical norms of scientific communication.
- The authors declare that the data, applications, and other content underlying the manuscript are referenced.
- The deposited manuscript is in PDF format.
- The authors declare that the research that originated the manuscript followed good ethical practices and that the necessary approvals from research ethics committees, when applicable, are described in the manuscript.
- The authors declare that once a manuscript is posted on the SciELO Preprints server, it can only be taken down on request to the SciELO Preprints server Editorial Secretariat, who will post a retraction notice in its place.
- The authors agree that the approved manuscript will be made available under a Creative Commons CC-BY license.
- The submitting author declares that the contributions of all authors and conflict of interest statement are included explicitly and in specific sections of the manuscript.
- The authors declare that the manuscript was not deposited and/or previously made available on another preprint server or published by a journal.
- If the manuscript is being reviewed or being prepared for publishing but not yet published by a journal, the authors declare that they have received authorization from the journal to make this deposit.
- The submitting author declares that all authors of the manuscript agree with the submission to SciELO Preprints.