

INFANT MORTALITY SURVEILLANCE SYSTEM, PERNAMBUCO 2013 TO 2022

SISTEMA DE VIGILÂNCIA DA MORTALIDADE INFANTIL, PERNAMBUCO, 2013 A 2022

*SISTEMA DE VIGILANCIA DE LA MORTALIDAD INFANTIL, PERNAMBUCO,
BRASIL, 2013 A 2022*

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ABSTRACT

Infant mortality remains a significant public health challenge, reflecting social inequalities and weaknesses in maternal and child care. **Objective:** To evaluate the Infant Mortality Surveillance System in the state of Pernambuco, Brazil, from 2013 to 2022. **Methods:** This was an evaluative study based on the methodology of the *Centers for Disease Control and Prevention*, published in 2001, which analyzed data quality through completeness and consistency, as well as the representativeness of the system. The study population included all infant deaths under one year of age recorded between 2013 and 2022. Publicly available data from the Mortality Information System were analyzed using TabNet, Microsoft Excel, and EpiInfo. The study complied with the guidelines of Resolution No. 466, issued in 2012 by the Brazilian National Health Council. **Results:** During the period, a total of 17,211 infant deaths were recorded. Mean data completeness was 93.8%, classified as excellent, and mean consistency was 99.2%, also classified as excellent. The representativeness of the system was considered good, showing coherence when compared with regional and national databases. **Conclusions:** The Mortality Information System demonstrated excellent data quality and adequate representativeness. It is recommended that the Ministry of Health promote scientific research on the evaluation of health information systems and that the State Health Secretariat raise awareness among professionals about the importance of accurately completing death certificates, and strengthen Technical Groups and Committees for the Prevention of Infant Deaths.

Keywords: *Mortality records; Infant mortality; Health information systems.*

RESUMO

A mortalidade infantil permanece como um importante desafio de saúde pública, refletindo desigualdades sociais e fragilidades na assistência materno-infantil. **Objetivo:** Avaliar o Sistema de Vigilância da Mortalidade Infantil em Pernambuco no período de 2013 a 2022. **Métodos:** Trata-se de um estudo avaliativo baseado na metodologia do *Centers for Disease Control and Prevention*, publicada em 2001, que analisou a qualidade dos dados por meio da completude e da consistência, além da representatividade do sistema. A população estudada incluiu todos os óbitos infantis em menores de 1 ano de idade registrados entre 2013 e 2022. Foram analisados dados públicos disponibilizados pelo Sistema de Informação sobre Mortalidade, utilizando os programas TabNet, Microsoft Excel e EpiInfo. O estudo respeitou as diretrizes da Resolução nº 466, de 2012, do Conselho Nacional de Saúde. **Resultados:** No período, foram registrados 17.211 óbitos infantis. A completude média foi de 93,8%, classificada como excelente, e a consistência média foi de 99,2%, também classificada como excelente. A representatividade do sistema foi considerada boa, apresentando coesão em comparação às bases regional e nacional. **Considerações Finais:** Conclui-se que o Sistema de Informação sobre Mortalidade apresentou excelente qualidade de dados e adequada representatividade. Ao Ministério da Saúde, recomenda-se estimular a produção científica voltada à avaliação dos sistemas de informação e, à Secretaria Estadual de Saúde, sensibilizar os profissionais sobre a importância do correto preenchimento da Declaração de Óbito e fortalecer os Grupos Técnicos e Comitês de Prevenção do Óbito Infantil.

Descritores: *Registros de mortalidade; Mortalidade infantil; Sistemas de informações em saúde.*

RESUMEN

La mortalidad infantil sigue siendo un importante desafío de salud pública, reflejando desigualdades sociales y fragilidades en la atención materno-infantil. **Objetivo:** Evaluar el Sistema de Vigilancia de la Mortalidad Infantil en el estado de Pernambuco, Brasil, entre 2013 y 2022. **Métodos:** Se trata de un estudio evaluativo basado en la metodología de los *Centers for Disease Control and Prevention*, publicada en 2001, que analizó la calidad de los datos mediante la completitud y la consistencia, además

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de la representatividad del sistema. La población estudiada incluyó todas las muertes infantiles en menores de un año registradas entre 2013 y 2022. Se analizaron datos públicos del Sistema de Información sobre Mortalidad, utilizando los programas TabNet, Microsoft Excel y EpiInfo. El estudio cumplió con las directrices de la Resolución nº 466, de 2012, del Consejo Nacional de Salud de Brasil. **Resultados:** En el período se registraron 17.211 muertes infantiles. La completitud media fue del 93,8%, clasificada como excelente, y la consistencia media fue del 99,2%, también clasificada como excelente. La representatividad del sistema fue considerada buena, mostrando coherencia en comparación con las bases regional y nacional. **Conclusiones:** El Sistema de Información sobre Mortalidad presentó excelente calidad de datos y adecuada representatividad. Se recomienda al Ministerio de Salud fomentar la producción científica sobre la evaluación de los sistemas de información y, a la Secretaría Estatal de Salud, sensibilizar a los profesionales sobre la importancia del correcto llenado de los certificados de defunción y fortalecer los Grupos Técnicos y Comités de Prevención de la Mortalidad Infantil.

Descriptores: Registros de mortalidad; Mortalidad infantil; Sistemas de información sanitaria.

INTRODUCTION

Infant mortality (IM) refers to the number of deaths among live-born children from birth up to, but not including, one year of age (i.e., 364 days). The infant mortality rate (IMR) is calculated using the number of deaths in children under one year of age per live births, multiplied by 1,000. Reducing this indicator is a priority on the global agenda for both developed and developing countries, representing a significant challenge for health systems^{1, 2}.

Information on deaths among children under one year of age can, to some extent, reflect inequities in healthcare for more vulnerable groups, reveal barriers to accessing services, and highlight regions that require greater investments to overcome weaknesses in maternal and child healthcare^{3, 4, 5}.

The Brazilian infant mortality rate (IMR) has shown a decline over the years, decreasing from 52.6 infant deaths in 1990 to 12.95 infant deaths in 2022. However, the country still presents substantial variability in infant mortality rates, which remain higher in the North and Northeast regions. In 2022, the IMR in the state of Pernambuco was 13.28 per 1,000 live births.⁶

In September 2000, the United Nations (UN) established the eight Millennium Development Goals (MDGs), which included the target of reducing the infant mortality rate (IMR) by 66% by 2015. Brazil achieved the MDG target in 2011, surpassing the global average reduction in IMR. Following the conclusion of the MDGs, in 2016 the UN launched the 17 Sustainable Development Goals (SDGs), which aim to eliminate preventable deaths of newborns and children under five years of age by 2030, setting specific targets for neonatal and infant mortality. Brazil's national goal is to reduce the IMR to no more than 5 deaths per 1,000 live births by 2030^{7, 8}.

The government of Pernambuco developed a long-term strategic development plan entitled “*Pernambuco 2035: Vision of the Future*.” The plan is structured around five pillars, including the “quality of life” pillar, which sets specific development goals with a target of reducing infant mortality (IM) to 8 deaths per 1,000 live births by 2035⁹. Most infant deaths result from preventable causes that could be totally or partially avoided through accessible healthcare and effective health services¹⁰. In addition, achieving the targets for reducing infant mortality requires that vital statistics information systems provide accurate and reliable data, making their continuous and systematic evaluation essential¹¹.

Therefore, the present study aims to evaluate the Infant Mortality Surveillance System in Pernambuco, Brazil, from 2013 to 2022, based on an analysis of data quality attributes and representativeness. The relevance of this information lies in its potential to identify preventable deaths and support recommendations for the reorganization of healthcare and health surveillance. The specific objectives include assessing data quality through completeness and consistency, evaluating the system's representativeness, and proposing improvements to the infant mortality surveillance system in Pernambuco.

METHODS

This study evaluated the infant mortality surveillance system in the state of Pernambuco, which has 9,058,931 inhabitants and is composed of 185 municipalities distributed across 12 Health Regions (HRs)¹². Each of these regions presents diverse socioeconomic and geographic characteristics, with varying levels of population density. The state's administrative organization follows the principles of decentralization, hierarchization, and regionalization, as established by Brazilian legislation, with the aim of ensuring effective public health management.

The study population consisted of all deaths among children under one year of age, from birth up to 364 days of life. The notifications were based on records from all municipalities that make up the 12 Health Regions of the state of Pernambuco.

The study covered the period from January 2013 to December 2022. Data and technical information were obtained from the Mortality Information System (SIM), through death certificate (DC) records available in DATASUS, infant mortality surveillance manuals, scientific literature, and consultations with professionals from the Infant and Fetal Mortality Surveillance Unit of the Pernambuco State Health Department (SES-PE).

Data were analyzed based on quality attributes (completeness and consistency) and representativeness, using Tabwin® version 3.6, Microsoft Excel 2016®, and Epi Info®. Descriptive statistical analysis included the calculation of absolute and relative frequencies, with results presented in tables and graphs. Data quality assessment followed the CDC guidelines, classifying results according to completeness and consistency: values equal to or greater than 90% were considered “excellent,” between 70% and 90% “fair,” and below 70% “poor.”

Data completeness was assessed based on the completion of death certificate (DC) fields, in accordance with the *Manual of Instructions for Completing the Death Certificate*¹². For the analysis, an adapted version of the Romero and Cunha (2006)¹⁴ scoring system was applied, excluding fields left blank or marked as “ignored.” The results were classified into five categories: excellent (greater than 95%), good (94.9%–90%), fair (89.9%–80%), poor (79.9%–50%), and very poor (less than 50%).

A total of 20 variables from different sections of the death certificate (Table 1) were analyzed, selected based on three criteria adapted from the study by Abath et al. (2014)¹⁵: mandatory variables (fields that did not allow progression without completion), essential variables (epidemiological in nature and fundamental for assessing the preventability of death, according to the Ministry of Health—BRAZIL, 2022)¹³, and important variables (relevant for the construction of epidemiological

indicators, as defined by the Infant Mortality Surveillance System of Pernambuco). To facilitate visualization of the completeness analysis results, each level of data completion was associated with a color defined by the researcher.

Data consistency refers to the coherence and plausibility of the information and was assessed by the proportion of notifications without missing values or conflicting categories¹⁵. Consistency was classified according to the following criteria: “excellent” (percentage of consistent records $\geq 90\%$), “fair” (70%–89.9%), and “poor” ($< 69.9\%$)¹⁵. For the consistency assessment, relationships between selected death certificate (DC) variables for deaths under one year of age were analyzed, and the expected results for each field were calculated based on the average of valid data recorded for each related field.

- Field 01 (Type of death: non-fetal death) $\times$ Field 34 (Death in relation to delivery: during or after).
- Field 20 (Place of death: hospital and other healthcare facilities) $\times$ Field 38 (Received medical care during the illness that led to death? Yes).
- Field 20 (Place of death: hospital and other healthcare facilities) $\times$ Field 21 (Facility: CNES code).

Representativeness was assessed based on the ability of the infant mortality surveillance system to document the occurrence of deaths over time and their distribution within the population, taking into account factors such as location and demographic characteristics¹⁷. To this end, non-fetal deaths among children under one year of age were analyzed at three territorial levels: Pernambuco, the Northeast region, and Brazil.

Representativeness was assessed through the characterization of cases, as described below:

- a) Person: distribution (%) of deaths among children under one year of age by sex, race/skin color, and age component;
- b) Time: distribution (%) of infant deaths by year of notification;
- c) Place: distribution (%) of infant deaths by place of occurrence.

The prevalence of each category was calculated and compared across territorial levels, considering prevalences with differences of up to 5% as comparable. Representativeness for each category was classified as high (H), moderate (M), or insufficient (I), depending on the comparability of prevalences. Representativeness of the broader blocks (Person, Place, and Time) was classified as good (G), fair (F), or poor (P), based on the prevalence of each category. The overall representativeness classification was determined according to the evaluation of the three blocks: good (G), moderate (M), or poor (P).

As this study used secondary public-domain data available on the DATASUS platform, it was exempt from review by a Research Ethics Committee involving human subjects. Nonetheless, all guidelines established by Resolution No. 466, of December 12, 2012, of the Brazilian National Health Council, as well as Law No. 13,709, of Au-

gust 14, 2018, on Personal Data Protection, were fully observed^{18,19}.

RESULTS

Between January 2013 and December 2022, a total of 17,211 deaths among children under one year of age were recorded in the Mortality Information System. According to age components, infant deaths in Pernambuco occurred predominantly in the early neonatal period (N = 9,321 deaths), followed by the post-neonatal period (N = 5,003 deaths), and finally the late neonatal period (N = 2,887 deaths). It is also noteworthy that this study identified 63 infant deaths associated with mothers aged between 11 and 14 years.

The assessment of the completeness of the 20 death certificate (DC) variables revealed an overall mean completion rate of 93.8%, classified as “GOOD.” Mandatory variables showed a completeness rate of 99.6%, classified as “EXCELLENT,” while essential and important variables had mean values of 93.1% and 91.7%, respectively, both classified as “GOOD.”

Regarding consistency, the overall mean of cross-relations between the variables was 99.5%, classified as “EXCELLENT” (Table 2).

Considering the final averages of completeness (93.8%) and consistency (99.5%), the overall mean for data quality was 96.6%, classified as “EXCELLENT.” The assessment of representativeness of the infant mortality surveillance system in Pernambuco indicated that deaths predominated among males, individuals of mixed race/skin color, and occurred mainly in the early neonatal age component. The “person” block was classified as having “GOOD” representativeness (Table 3).

According to the temporal assessment (2013–2022), the number of infant deaths in Pernambuco showed a similar pattern when compared with the number of infant deaths in the Northeast region and in Brazil. Therefore, the classification of the “time” block indicates “GOOD” representativeness, as shown in Table 4.

Regarding the representativeness of the “place” block, the frequency of deaths, predominantly occurring in hospitals, showed a similar trend across the territorial levels analyzed (Table 5). These results indicate “GOOD” representativeness for this block.

Table 1 - Completeness of death certificate fields for deaths under one year of age, by variable, Pernambuco, Brazil, 2013–2022.

Block / Variables	Year of death										Change	Mean (dp)	Category
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022			
	N= 1.999	N= 1.892	N=1.886	N= 1.821	N= 1.648	N=1.714	N=1.633	N=1.493	N=1.567	N=1.558			
	%	%	%	%	%	%	%	%	%	%			
Block I – Identification*	97,6	97,6	97,5	98,0	97,5	97,5	97,4	97,8	98,4	98,5	1,0%	97,8(±0,4)	Excellent
Date of death	100,	100	100	100	100	100	100	100	100	100	0,0%	100,0	Excellent
Date of birth	99,1	99,2	98,8	99,8	99,6	99,4	98,8	99,0	99,4	99,5	0,4%	99,3	Excellent
Age (newborn)	100	100	100	100	100	100	100	100	100	100	0,0%	100,0	Excellent
Sex	99,3	99,2	98,5	99,2	98,7	98,5	98,6	98,6	99,0	99,2	-0,1%	98,9	Excellent
Race/skin color	92,8	92,8	93,2	93,6	91,9	91,9	91,5	92,7	94,8	95,9	3,3%	93,1	Good
Time	94,1	94,6	94,7	95,3	94,5	94,9	95,4	96,2	97,0	96,4	2,4%	95,3	Excellent
Block II – Residence	100	100	100	100	100	100	100	100	100	100	0	100 (±0,0)	Excellent
Municipality of residence	100	100	100	100	100	100	100	100	100	100	0	100,0	Excellent
Block III – Occurrence	95,5	98,4	98,3	98,1	98,5	97,9	97,8	98,4	98,7	98,3	2,9%	97,9(±0,9)	Excellent
Place of occurrence	99,9	99,9	100	100	100	99,9	99,9	100	100	100	0,1%	99,9	Excellent
Facility	92,4	95,3	94,8	94,3	95,5	93,9	93,7	95,1	96,2	94,9	2,7%	93,6	Good
Municipality of occurrence	100	100	100	100	100	100	100	100	100	100	0,0%	100,0	Excellent
Block IV * <01 year*	90,1	89,8	88,7	89,0	89,3	89,3	91,0	91,1	91,8	91,2	101,2%	90,2 (±1,1)	Good
Mother's age	91,4	91,5	90,6	91,2	91,2	91,5	92,4	92,8	93,0	93,0	1,8%	92,2	Good
Schooling	91,8	89,8	87,9	88,7	88,6	88,5	89,9	89,0	89,7	90,3	-1,6%	91,0	Good
Number of previous children	89,6	89,3	89,0	88,3	89,5	89,5	91,1	91,6	92,8	92,1	2,8%	90,8	Good
Gestational age	80,5	82,1	79,1	79,6	81,5	82,0	86,3	86,4	87,7	86,7	7,7%	83,6	Fair
Type of pregnancy	93,3	92,6	91,9	92,2	92,5	92,4	93,9	94,0	94,4	93,4	0,1%	93,3	Good
Type of delivery	92,2	91,7	91,1	91,4	91,5	91,2	93,2	93,1	93,7	92,6	0,4%	92,4	Good
Neonatal death during delivery	91,9	91,3	90,1	91,1	90,4	90,3	90,1	91,2	92,0	91,0	-1,0%	91,4	Good
Birth weight	90,2	90,6	90,2	89,8	89,4	89,4	91,6	91,1	91,4	90,5	0,3%	90,3	Good
Block V – Causes	64,9	65,4	65,8	69,2	69,5	69,6	68,6	69,7	69,8	69,3	6,9%	38,4(±2,9)	Poor
Medical care	70,6	70,4	71,4	82,9	83,9	84,0	80,4	83,7	83,0	80,7	14,3%	75,6	Poor
Block VI * Physician*	94,0	95,3	95,4	96,6	96,5	96,8	96,7	97,1	97,5	97,7	3,9%	95,8(±1,1)	Excellent
Death certified	94,0	95,3	95,4	96,6	96,5	96,8	96,7	97,1	97,5	97,7	3,9%	95,8	Excellent

Source: DATASUS*data retrieved in September 2024. -Author's own elaboration.

Table 2 - Percentage of consistencies between related variables in infant death notifications and consistency classification, Pernambuco, Brazil, 2013–2022.

Variables	Total N= (17.211)			Category
	N*	C**	%	
Type of death × timing of death in relation to delivery	15.802	15.692	99,3	EXCELLENT
Place of death × received medical care during the illness that caused death	12.946	12.845	98,3	EXCELLENT
Place of death × CNES code	16.278	16.278	100,0	EXCELLENT

*except blank fields. ** valid/correct responses. Source: DATASUS. Author's own elaboration.

Table 3 - Assessment of the representativeness attribute by person, based on deaths reported in the Mortality Information System (SIM) in Pernambuco, the Northeast region, and Brazil, 2013–2022.

Block	Variables	Category	Pernambuco (N=17.211)		Northeast (N=111.040)		Brazil (N=354.181)		RV	RB
			N	%	n	%	n	%		
PERSON	Sex	Male	9360	54,4	61806	55,7	195294	55,4	A	B
		Female	7663	44,5	49196	44,3	156899	44,5	A	
	Race/skin color	White	3685	22,8	19021	19,6	138949	42,9	R	
		Black	226	1,4	2252	2,3	8738	2,7	R	
		Asian	11	0,07	161	0,1	602	0,2	A	
		Brown	11963	74,0	74558	77,0	169052	52,1	R	
	Age component	Indigenous	141	0,9	853	0,9	6771	2,0	R	
		Early neonatal	9321	54,2	62101	55,4	186303	52,7	A	
		Late neonatal	2887	16,8	17506	15,6	60799	17,1	A	
		Post-neonatal	5003	29,0	32433	28,9	107079	30,2	A	

N = total reported deaths under 1 year of age; RB = block representativeness; RV = variable representativeness; “A” = high variable representativeness; “R” = fair variable representativeness; “B” = good representativeness of the variable block. Source: DATASUS. Author's own elaboration.

Table 4 — Assessment of the representativeness of the variable “Year of Notification” in the “Time” block of the infant mortality surveillance system, based on deaths reported in the Mortality Information System in Pernambuco, the Northeast region, and Brazil, 2013–2022.

Block	Variable	Category	Pernambuco (N=17.211)		Northeast (N=111.040)		Brazil (N=354.181)		RV	RB
			n	%	n	%	n	%		
TIME	Year of notificati	2013	1.999	11,6	12.717	11,3	38.966	11,0	A	
		2014	1.892	10,9	12.112	10,8	38.432	10,8	A	
		2015	1.886	10,9	11.825	10,5	37.501	10,6	A	

on of death in <1 year	2016	1.821	10,6	11.505	10,2	36.350	10,2	A	B
	2017	1.648	9,6	11.490	10,2	36.223	10,2	A	
	2018	1.714	9,9	11.314	10,0	35.864	10,1	A	
	2019	1.633	9,5	11.035	9,8	35.293	9,9	A	
	2020	1.493	8,7	9.997	8,9	31.439	8,8	A	
	2021	1.567	9,1	10.053	9,0	31.856	8,9	A	
	2022	1.558	9,0	9.992	8,9	32.257	9,1	A	

N = total reported deaths under 1 year of age; RB = block representativeness; RV = variable representativeness; “A” = high variable representativeness; “R” = fair variable representativeness; “B” = good representativeness of the variable block. Source: DATASUS. Author’s own elaboration.

Thus, the infant mortality surveillance system of Pernambuco was classified as having “GOOD” representativeness. This classification was due to obtaining “B” scores for the “time” “person” and “place” blocks.

DISCUSSION

The analysis of the historical series of the infant mortality surveillance system in Pernambuco revealed that the system is representative and demonstrates excellent data quality. The quality of a database is determined by its completeness and reliability, and inconsistency can affect the accuracy of the information, leading to incorrect diagnoses²⁰.

The completeness of the variables was a central point of the evaluation, and it was observed that mandatory variables consistently maintained an excellent level of completeness over time, facilitated by the system itself, which does not allow progression without filling in this information. However, completeness does not assess the quality of the information provided, and, for each variable, there is a standard for data entry, as defined in the *Manual of Instructions for Completing the Death Certificate (DC)* of the Ministry of Health¹³. Studies indicate that inadequate completion of variables may be related to insufficient professional training, the limited importance given to completing the death certificate (DC) in medical schools, and the lack of recognition of the DC as an instrument for epidemiological analysis^{4,14}.

When comparing the results of the present study with those of Ramalho et al. (2015)⁴, an improvement in the completeness of variable completion over time was observed. Variables such as “sex” and “place of death” considered mandatory, maintained high levels of completeness, while non-mandatory variables such as “race/skin color” and “birth weight” showed improvement, progressing from poor to good levels of completeness. However, some variables, such as “gestational weeks” and “medical care,” still present completion issues, which is consistent with other studies that also highlight shortcomings in the completion of these variables¹⁴.

It is still necessary to consider that categorizing variables as “mandatory”, “essential,” and “important” may give the false impression that some variables are less relevant, which can influence the attention given to their completion²¹.

With regard to data consistency, the study revealed a high degree of coherence in cross-checked information, although the variables assessed for consistency are

limited and may not reflect all inconsistencies in the surveillance system. Lack of knowledge of the completion manual by physicians and other health professionals may also affect the accuracy of the information²².

The study also demonstrated that the infant mortality surveillance system in Pernambuco has good representativeness, with the distribution of deaths across time, place, and person being comparable to that of the Northeast region and Brazil. The profile of infant deaths shows that most occur among neonates, in males, and in children identified as mixed race/skin color (pardo). Early neonatal deaths, often associated with maternal/obstetric factors such as pregnancy complications and prematurity, indicate critical areas for health investments^{11,23}. The present study also revealed that, between 2013 and 2022, 63 infant deaths were recorded among mothers aged 11 to 14 years. Pregnancy in this age group, under any circumstances, constitutes presumed sexual violence regardless of consent. Adolescent pregnancy, in addition to its social repercussions and impacts on maternal health, may also be associated with serious harm to newborns²⁴.

CONCLUSION

The study identified improvements in the quality of death certificate (DC) data and highlighted the representativeness of the infant mortality surveillance system, which is essential for public policy formulation. However, greater government engagement is needed to ensure the continuous improvement of Mortality Information System (SIM) data and the full use of the system's potential. Therefore, the study recommends several strategies to strengthen the system, such as:

To the Ministry of Health:

- Encourage research that evaluates Information Systems at all levels;
- Disseminate the *Manual of Instructions for Completing the Death Certificate (DC)*;
- Promote data review and cross-linkage of databases in health surveillance.

To the Pernambuco State Health Department:

- Train professionals on the correct completion of the Death Certificate (DC) and the importance of data quality;
- Strengthen training on Mortality Information System (SIM) standards and procedures;
- Reinforce Technical Groups and Infant Death Prevention Committees;
- Provide training to municipalities to improve information quality and data correction.

To health professionals:

In cases of confirmed or even suspected adolescent pregnancy (<14 years), verify whether notification has been made within 24 hours, in accordance with Ordinance MS/GM No. 1271/2014²⁵, as such cases are classified as violence. It is also mandatory to report to the Guardianship Council and law enforcement authorities²⁶.

This study, however, has some limitations, such as the use of secondary data from the Mortality Information System (SIM), which may hinder a more up-to-date

analysis due to the time lag between the occurrence of death and the publication of the data. In addition, the COVID-19 pandemic may have influenced death records from 2020 onward.

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