Epidemiological investigation of perinatal deaths in Recife-Pernambuco: a quality assessment

Isabela de Lucena HeráclioI, Maysa Almeida da SilvaII, Mirella Bezerra Rodrigues VilelaI, Conceição Maria de OliveiraIII, Paulo Germano de FriasIV, Cristine Vieira do BonfimI

I Universidade Federal de Pernambuco. Recife, Pernambuco, Brazil.
II Fundação Joaquim Nabuco, Social Research Directorate. Recife, Pernambuco, Brazil.
III Centro Universitário Maurício de Nassau. Recife, Pernambuco, Brazil.
IV Instituto de Medicina Integral Prof. Fernando Figueira, Study Group on Health Assessment. Recife, Pernambuco, Brazil.

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Abstract
Objective: to evaluate the completeness of perinatal death investigation sheets, stratified by age components. Method: descriptive study carried out in Recife, PE, in 2014. Among 308 perinatal deaths, 46 were excluded from this study due to association with congenital malformations, and 7 due to missing investigation sheets. Analysis included 255 deaths (160 fetal deaths, and 95 preterm neonatal deaths). The degree of completeness of 98 variables was calculated. They were aggregated into six blocks: identification, prenatal care, birth care, family characteristics, occurrence of death and conclusions and recommendations. Results: the median rate of completeness for perinatal death investigation sheets was 85.7% (82.8% for records of fetal deaths and 89.5% for records of preterm neonatal deaths). The best-filled information block was “identification” (96.1%), as well as its components: fetal (94.7%) and preterm neonatal (97.9%). The worst was “prenatal care” (69.8%), along with its components: fetal (73.8%) and preterm neonatal (67.4%). Conclusion: investigation sheets had good completeness; there were differences between variables and components of perinatal death.

Descriptors: Perinatal Mortality; Epidemiological Surveillance; Vital Statistics; Health Information Systems; Public Health.

Resumo
Objetivo: avaliar a completude das variáveis das fichas de investigação dos óbitos perinatais, estratificadas por componentes etários. Método: estudo descritivo realizado no Recife-PE, em 2014. Dos 308 óbitos perinatais, excluíram-se 46 decorrentes de malformação congênita e 7 fichas não localizadas. A análise contou com 255 óbitos (160 fetais e 95 neonatais precoces). Calculou-se o grau de completude de 98 variáveis agregadas em seis blocos: identificação, pré-natal, nascimento, características da família, ocorrência do óbito e conclusões e recomendações. Resultados: a mediana de preenchimento do perinatal foi 85,7% (82,8% fetal e 89,5% neonatal precoce). O bloco de melhor preenchimento foi “identificação” (96,1%) e seus componentes: fetal (94,7%) e preturno neonatal (97,9%). O pior foi “pré-natal” (69,8%), e os de pior foram “pr- pré-natal” (69,8%), acompanhado pelo fetal (73,8%) e neonatal precoce (67,4%). Conclusão: observou-se completude boa das fichas de investigação, existindo diferenças entre as variáveis e os componentes do óbito perinatal.

Descritores: Mortalidade Perinatal; Vigilância Epidemiológica; Estatísticas Vitais; Sistema de Informação em Saúde; Saúde Pública.

Resumen
Objetivo: evaluar la completitud de las variables de las fichas de investigación de las muertes perinatales, estratificadas por componentes de edad. Método: estudio descritivo realizado en Recife-PE, en 2014. De las 308 muertes perinatales, se excluyeron 46 derivadas de malformación congénita y 7 fichas no localizadas. El análisis incluyó 255 muertes (160 fetales y 95 neonatales precoces). Se calculó el grado de completitud de 98 variables agregadas en seis bloques: identificación, prenatal, nacimiento, características de la familia, ocurrencia del óbito, y conclusiones y recomendaciones. Resultados: la mediana de llenado del perinatal fue 85,7% (82,8% fetal y 89,5% neonatal precoz). El bloque de mejor llenado fue “identificación
for the perinatal* (96.1%) and its components, fetal (94.7%) and neonatal (97.9%), and the perinatal was “premature” (95.8%), accompanied by the fetal (73.8%) and neonatal premature (67.4%). Conclusion: se observó una buena completitud de las fichas de investigación, existiendo diferencias entre las variables y los componentes del óbito perinatal.

Descriptors: Mortalidad Perinatal; Monitoreo Epidemiológico; Estadísticas Vitales; Sistemas de Información en Salud; Salud Pública.

INTRODUCTION

Deaths in the perinatal period, which range from the 22nd week of gestation to the sixth day of life, are evidence of socioeconomic vulnerabilities and compromised quality of maternal and child healthcare1-8. Worldwide, there is an estimated 4.9 million perinatal deaths per year, with 2 million fetal deaths and 2.9 million preterm neonatal deaths. The perinatal death estimate for Brazil is 53,1709; most deaths were preventable and often remain uncounted4.

Although the World Health Organization (WHO) launched in 2014 a plan of action to significantly reduce preventable deaths and fetal deaths by 203510, the organization’s Sustainable Development Goals did not prioritize the monitoring of perinatal mortality rate, keeping it out of the public’s attention11. However, countries that have vital statistics information systems with good coverage and reliable data can acquire knowledge on their perinatal epidemiological situation, planning interventions in favor of maternal and newborn health12.

Given the absence and insufficiency of vital information and better insight into perinatal deaths, death surveillance by combining maternal sociodemographic data, risk factors, healthcare histories and their nonconformities facilitates the understanding of the circumstances around the occurrence of death12-14. In Brazil, despite the fact that infant and fetal death surveillance became mandatory in the health services that make up the Unified Health System (SUS) only in 2010, there were several successful death surveillance experiences prior to the constitution of this normative base15-16.

Studies evaluating all stages of the death surveillance process and its investigative tools are still meager in the country17-18. Currently available analyzes on the consistency of information and its investigative tools are still meager in the country (10). Currently available analyzes on the consistency of information and its investigative tools are still meager in the country (10). Currently available analyzes on the consistency of information and its investigative tools are still meager in the country (10).

Inclusion and exclusion criteria

In 2014, 308 perinatal deaths were recorded in the Mortality Information System (SIM), including those associated with mothers who resided in Recife. Perinatal deaths due to congenital malformations and those with missing investigation sheets were excluded.

Data source

Mortality Information System (SIM) and perinatal death investigation sheets. This sheet includes all the variables that the Ministry of Health requires to be monitored19, alongside others that are of local interest.

Study protocol, analysis of results and statistics

Structured variables (n = 98) were analyzed in eight blocks: notification and investigation of death; identification; prenatal care; birth care; family characteristics; occurrence of death; and conclusions, recommendations and preventive measures.

Completeness was analyzed by the proportion of filled fields in each variable and each block, and presented according to fetal and preterm neonatal components. Investigation sheet data were coded and typed with double entry, for inconsistency analysis and to minimize errors, using the Epi Info software, version 7.0. In order to classify the filling level of the variables, the scale proposed by Romero and Cunha18 was adopted: excellent (more than 95.0% filled); good (90.1 to 95.0%); regular (80.1 to 90.0%); poor (50.1 to 80.0%) and very poor (50% or less). Descriptive statistics were performed through R software, version 3.2.2.

RESULTS

Among 308 perinatal deaths, 46 (14.9%) were excluded from the study because they were associated with congenital malformations. The perinatal death estimate for Brazil is 53,1709; most deaths were preventable and often remain uncounted4.
malformation, and 7 (2.3%) due to missing investigation sheets. Analysis included 255 deaths (160 fetal deaths, and 95 preterm neonatal deaths).

The variables analyzed presented a median filling level of 85.7%. For fetal and preterm neonatal deaths, the median filling level was 82.8% and 89.5%, respectively. In the perinatal general category, the best-filled block of variables was “identification,” with a median filling level of 96.1%. The worst was “prenatal care,” with 69.8%. In both perinatal components, the “identification” block presented the best completeness (fetal: 94.7%; preterm neonatal: 97.9%). Similarly, the block with the worst completeness among components was prenatal care (73.8% and 67.4%) (Table 1).

Table 2 presents data on death identification. Among a total of 11 variables, 7 had “excellent” completion. The variable with the lowest completion proportion (40.0% = “very poor”) in perinatal death investigation sheets was “partner occupation.” Among 19 variables related to prenatal care, 4 were classified as having “excellent” completion and 6 were considered as having “very poor” completion.

Among 21 birth-related variables, 9 (42.8%) had “excellent” and 5 had “very poor” (23.8%) filling levels. For the fetal component, the variable with the lowest completeness was “amniotic fluid odor” (7.5%), and for the preterm neonatal it was “caesarean section indication” (13.7%) (Table 3).

In the “family characteristics” block, among 12 variables, 8 were classified as having “regular” completion, and 4 as having “poor” completion. As for the fields related to “occurrence of death,” among 11 variables, 3 had “excellent” completion, and 3 had “very poor” completion (“perinatal” general category). Variables with the best filling levels were “place of occurrence” (99.4%) and “necropsy” (99.4%), in the fetal component. In the preterm neonatal component, “place of occurrence” and “unit type” stood out with 100% completion (Table 4).

In the block of variables related to conclusions and recommendations, 5 (8.9%) were considered to have “excellent” completion. Variables with the best percentage of completeness in the perinatal general category were “avoidability classification,” and whether the investigation changed or corrected the cause of death, with 100% completion for both (Table 5).

Table 1 – Descriptive statistics: completeness of perinatal death investigation sheets, according to variable block, Recife, Pernambuco, Brazil, 2014

| Variable block                      | Perinatal | Fetal | Preterm neonatal |
|-------------------------------------|-----------|-------|------------------|
|                                     | Mean ± SD | Mean ± SD | Mean ± SD       |
|                                     | Median    | Min.  | Max.             | Median    | Min.  | Max.             |
| Identification                      | 82.5 ± 18.05 | 96.1   | 40 100           | 84.4 ± 18.96 | 94.7  | 44.4 100         | 92.2 ± 19.83 | 97.9  | 32.6 100         |
| Prenatal care                       | 67.6 ± 25.9 | 69.8   | 26.7 98.4        | 67.6 ± 25.7 | 73.8  | 26.3 98.1        | 67.6 ± 26.5  | 67.4  | 24.2 100         |
| Birth care                          | 74.1 ± 31.6 | 87.1   | 10.6 100         | 66.2 ± 37  | 81.9  | 7.5 100          | 76 ± 30       | 89.5  | 13.7 100         |
| Family characteristics              | 79.2 ± 6   | 82.4   | 62.4 83.5        | 77.4 ± 5   | 79.4  | 63.1 81.3        | 82.4 ± 7.8    | 86.3  | 61.1 87.4        |
| Occurrence of death                 | 69.7 ± 32.9 | 80     | 15.3 99.6        | 73.2 ± 29.2 | 82.8  | 30 7.4           | 70.3 ± 35.8   | 82.1  | 7.4 100          |
| Conclusions and recommendations     | 78.6 ± 22.9 | 85.7   | 12.2 100         | 80.9 ± 19.8 | 85    | 10.6 100         | 86.1 ± 17.1   | 91.6  | 14.7 100         |

Note: SD: Standard Deviation.

Table 2 – Completeness of variables in the “identification” block of perinatal death investigation sheets, Recife, Pernambuco, Brazil, 2014

| Variables                      | Perinatal | Fetal | Preterm neonatal |
|--------------------------------|-----------|-------|------------------|
|                                 | n %      |       |                  |
| Moment of death                | 255 100.0| E     |                  |
| Sex                            | 255 100.0| E     |                  |
| Age                            | 94 98.9  | E     |                  |
| Race/color                     | 200 78.4 | P     |                  |
| Mother’s age                   | 253 99.2 | E     |                  |
| Mother’s race/color            | 200 78.4 | P     |                  |
| Mother’s level of education    | 244 95.7 | E     |                  |
| Mother’s occupation            | 245 96.1 | E     |                  |
| Marital status                 | 215 84.3 | RE    |                  |
| Partner occupation             | 102 40.0 | VP    |                  |
| Area covered by the FHS        | 250 98.0 | E     |                  |
| Block average                  | 82.5     |       |                  |
|                                 |          |       |                  |
|                                 | n %      |       |                  |
|                                 |          |       |                  |

Note: *classification; FHS = Family Health Strategy; E = excellent; G = good; RE = regular; P = poor; VP = very poor; NA = not applicable
Table 3 – Completeness of variables in the “prenatal care” and “birth care” blocks of perinatal death investigation sheets, Recife, Pernambuco, Brazil, 2014

| Variables                        | Prenatal | Age components | Fetal | Age components | Preterm neonatal | Age components |
|----------------------------------|----------|----------------|-------|----------------|------------------|----------------|
|                                  | n  | %   | Cl* | n  | %   | Cl* | n  | %   | Cl* |
| Prenatal care                    |    |      |     |    |      |     |    |      |     |
| Prenatal                         | 251| 98.4| E   | 156| 97.5| E   | 95 | 100.0| E   |
| Prenatal unit type               | 204| 80.0| R   | 135| 84.4| RE  | 69 | 72.6 | R   |
| Starting month of prenatal period| 199| 78.0| R   | 123| 76.9| R   | 76 | 80.0 | R   |
| Number of medical consultations  | 205| 80.4| RE  | 129| 80.6| RE  | 76 | 80.0 | R   |
| Familial antecedents             | 149| 58.4| R   | 94 | 58.8| R   | 55 | 57.9 | R   |
| Personal antecedents             | 116| 45.5| MR  | 69 | 43.1| MR  | 47 | 49.5 | MR  |
| Complementary examinations       | 161| 63.1| R   | 104| 65.0| R   | 57 | 60.0 | R   |
| Procedures                       | 178| 69.8| R   | 118| 73.8| R   | 60 | 63.2 | R   |
| Risk factors                     | 120| 47.1| MR  | 74 | 46.3| MR  | 46 | 48.4 | MR  |
| Complications                    | 170| 66.7| R   | 106| 66.3| R   | 64 | 67.4 | R   |
| Treatment                        | 84 | 32.9| MR  | 52 | 32.5| MR  | 32 | 33.7 | MR  |
| Number of previous pregnancies   | 251| 98.4| E   | 157| 98.1| E   | 94 | 98.9 | E   |
| Number of vaginal deliveries     | 233| 91.4| B   | 142| 88.8| RE  | 91 | 95.8 | E   |
| Number of cesarean deliveries    | 232| 91.0| B   | 141| 88.1| RE  | 91 | 95.8 | E   |
| Number of live births            | 250| 98.0| E   | 156| 97.5| E   | 94 | 98.9 | E   |
| Number of fetal losses/abortions | 251| 98.4| E   | 157| 98.1| E   | 94 | 98.9 | E   |
| Interval between the last two pregnancies | 79 | 31.0| MR  | 56 | 35.0| MR  | 23 | 24.2 | MR  |
| Pre-gestational weight           | 74 | 29.0| MR  | 43 | 26.9| MR  | 31 | 32.6 | MR  |
| Maternal height                  | 68 | 26.7| MR  | 42 | 26.3| MR  | 26 | 27.4 | MR  |

Birth care

| Variables                        | Perinatal | Age components | Fetal | Age components | Preterm neonatal | Age components |
|----------------------------------|-----------|----------------|-------|----------------|------------------|----------------|
|                                  | n  | %   | Cl* | n  | %   | Cl* | n  | %   | Cl* |
| Place of birth                   | 255| 100.0| E   | 160| 100.0| E   | 95 | 100.0| E   |
| Birth unit type                  | 252| 98.8| E   | 158| 98.8| E   | 94 | 98.9| E   |
| Partogram                        | 49 | 51.6| R   | NA | 51.6| R   | 49 | 51.6| R   |
| Induction of childbirth          | 211| 82.7| RE  | 134| 83.8| RE  | 77 | 81.1| RE  |
| Rapid syphilis test              | 222| 87.1| RE  | 137| 85.6| RE  | 85 | 89.3| RE  |
| HIV rapid test                   | 198| 77.6| R   | 126| 78.8| R   | 72 | 75.8| R   |
| Gestational age                  | 253| 99.2| E   | 158| 98.8| E   | 95 | 100.0| E   |
| Type of pregnancy                | 255| 100.0| E   | 160| 100.0| E   | 95 | 100.0| E   |
| Type of birth                    | 255| 100.0| E   | 160| 100.0| E   | 95 | 100.0| E   |
| Caesarean section indication     | 53 | 20.8| MR  | 40 | 25.0| MR  | 13 | 13.7| MR  |
| Pre-delivery intervention        | 36 | 14.1| MR  | 15 | 9.4 | MR  | 21 | 22.1| MR  |
| Sac rupture time                 | 76 | 29.8| MR  | 34 | 21.3| MR  | 42 | 44.2| MR  |
| Amniotic fluid odor              | 27 | 10.6| MR  | 12 | 7.5 | MR  | 15 | 15.8| MR  |
| Appearance of amniotic fluid     | 111| 43.5| MR  | 60 | 37.5| MR  | 51 | 53.7| R   |
| Birth weight                     | 255| 100.0| E   | 160| 100.0| E   | 95 | 100.0| E   |
| Assisted birth                   | 219| 85.9| RE  | 128| 80.0| R   | 91 | 95.8| E   |
| Apgar score 1-min                | 91 | 95.8| E   | NA | 91  | E   |
| Apgar score 5-min                | 92 | 96.8| E   | NA | 92  | E   |
| NB with issues                   | 84 | 88.4| RE  | NA | 84  | RE  |
| NB length of stay in maternity ward | 94 | 98.9| E   | NA | 94  | E   |
| Reason for permanence            | 70 | 73.7| R   | NA | 70  | R   |

Note: *classification; NB = Newborn; E = excellent; G = good; RE = regular; P = poor; VP = very poor, NA = not applicable

Table 4 – Completeness of variables related to “family characteristics” and “occurrence of death” in perinatal death investigation sheets, Recife, Pernambuco, Brazil, 2014

| Variables                        | Perinatal | Age components | Fetal | Age components | Preterm neonatal | Age components |
|----------------------------------|-----------|----------------|-------|----------------|------------------|----------------|
|                                  | n  | %   | Cl* | n  | %   | Cl* | n  | %   | Cl* |
| Family characteristics           |    |      |     |    |      |     |    |      |     |
| Private health plan              | 194| 76.1| P   | 120| 75.0| P   | 74 | 77.9| P   |
| Family income                    | 196| 76.9| P   | 122| 76.3| P   | 74 | 77.9| P   |
| Number of inhabitants in the residence | 210| 82.4| RE  | 127| 79.4| P   | 83 | 87.4| RE  |

Note: *classification; NB = Newborn; E = excellent; G = good; RE = regular; P = poor; VP = very poor, NA = not applicable

To be continued
Table 4 (concluded)

| Variables                                                                 | Perinatal                      | Fetal                        | Preterm neonatal               |
|                                                                         | n   | %   | CI* | n   | %   | CI* | n   | %   | CI* |
| Number of ≤ 5 years old children                                      | 159 | 62.4 | P   | 101 | 63.1 | P   | 58  | 61.1 | P   |
| Number of dormitory rooms                                             | 210 | 82.4 | RE  | 127 | 79.4 | P   | 83  | 87.4 | RE  |
| Dwelling type                                                          | 210 | 82.4 | RE  | 128 | 80.0 | P   | 82  | 86.3 | RE  |
| House construction material                                           | 211 | 82.7 | RE  | 129 | 80.6 | RE  | 82  | 86.3 | RE  |
| Water supply                                                          | 213 | 83.5 | RE  | 130 | 81.3 | RE  | 83  | 87.4 | RE  |
| Destination of bodily waste                                           | 212 | 83.1 | RE  | 129 | 80.6 | RE  | 83  | 87.4 | RE  |
| Destination of trash                                                  | 210 | 82.4 | RE  | 127 | 79.4 | P   | 83  | 87.4 | RE  |
| Access to health services                                             | 205 | 80.4 | RE  | 126 | 78.8 | P   | 79  | 83.2 | RE  |
| Availability of medical consultations                                  | 195 | 76.5 | P   | 120 | 75.0 | P   | 75  | 78.9 | P   |

Occurrence of death

| Variables                                                                 | n   | %   | CI* | n   | %   | CI* | n   | %   | CI* |
| Place of occurrence                                                     | 254 | 99.61 | E   | 159 | 99.4 | E   | 95  | 100.0 | E   |
| Unit type                                                               | 253 | 99.22 | E   | 158 | 98.8 | E   | 95  | 100.0 | E   |
| Hospital length of stay                                                | 89  | 93.68 | G   | NA  | 89   | 93.7 | G   |
| Sector of occurrence                                                    | 76  | 80.00 | P   | NA  | 76   | 80.0 | P   |
| Child/mother transferred from another unit                               | 204 | 80.00 | P   | 113 | 70.6 | P   | 91  | 95.8 | E   |
| General condition at admission                                          | 39  | 15.29 | VP  | NA  | 35   | 36.8 | VP  |
| Diagnostic hypothesis at admission                                      | 165 | 64.71 | P   | 87  | 54.4 | P   | 78  | 82.1 | RE  |
| Final diagnosis                                                         | 228 | 89.41 | RE  | 152 | 95.0 | G   | 76  | 80.0 | P   |
| Necropsy                                                                | 247 | 96.86 | E   | 159 | 99.4 | E   | 88  | 92.6 | G   |
| Necropsy site                                                           | 68  | 26.67 | VP  | 61  | 38.1 | VP  | 7   | 7.4  | P   |
| Necroscopic report                                                      | 55  | 21.57 | VP  | 48  | 30.0 | VP  | 7   | 7.4  | P   |

Note: *classification; E = excellent; G = good; RE = regular; P = poor; VP = very poor; NA = not applicable.

Table 5 – Completeness of variables in the conclusions and recommendations block of perinatal death investigation sheets, Recife, Pernambuco, Brazil, 2014

| Variables                                                                 | Perinatal                      | Fetal                        | Preterm neonatal               |
|                                                                         | n   | %   | CI* | n   | %   | CI* | n   | %   | CI* |
| Investigation changed/corrected cause of death                          | 255 | 100.0 | E   | 160 | 100.0 | E   | 95  | 100.0 | E   |
| Investigation changed another field of the death declaration            | 254 | 99.6 | E   | 160 | 100.0 | E   | 94  | 98.9 | E   |
| Investigation changed another field of the live birth declaration       | 87  | 96.1 | E   | NA  | 87   | 91.6 | P   |
| Issues identified after investigation                                   | 249 | 97.6 | E   | 155 | 96.9 | E   | 94  | 98.9 | E   |

Access failure

| Variables                                                                 | n   | %   | CI* | n   | %   | CI* | n   | %   | CI* |
| To family planning                                                      | 231 | 90.6 | G   | 142 | 88.8 | RE  | 89  | 93.7 | G   |
| To prenatal care                                                        | 235 | 92.2 | G   | 144 | 90.0 | G   | 91  | 95.8 | E   |
| To childbirth assistance                                                | 223 | 87.5 | RE  | 136 | 85.0 | RE  | 87  | 91.6 | G   |
| To maternity ward newborn assistance                                    | 69  | 72.6 | P   | NA  | 69   | 72.6 | P   |
| Due to family difficulties                                              | 212 | 83.1 | RE  | 127 | 79.4 | P   | 85  | 89.5 | RE  |

Care failure

| Variables                                                                 | n   | %   | CI* | n   | %   | CI* | n   | %   | CI* |
| Family planning                                                         | 229 | 89.8 | RE  | 141 | 88.1 | RE  | 88  | 92.6 | G   |
| Prenatal care                                                           | 234 | 91.8 | G   | 145 | 90.6 | G   | 89  | 93.7 | G   |
| Delivery                                                                | 224 | 87.8 | RE  | 135 | 84.4 | RE  | 89  | 93.7 | G   |
| Maternity ward newborn assistance                                      | 68  | 71.6 | P   | NA  | 68   | 71.6 | P   |
| External causes                                                         | 214 | 83.9 | RE  | 127 | 79.4 | P   | 87  | 91.6 | G   |
| In primary care coverage                                                | 227 | 89.0 | RE  | 138 | 86.3 | RE  | 89  | 93.7 | G   |
| In reference and counter-reference                                      | 198 | 77.6 | P   | 117 | 73.1 | P   | 81  | 85.3 | RE  |
| In high-risk prenatal care                                              | 196 | 76.9 | P   | 116 | 72.5 | P   | 80  | 84.2 | RE  |
| In a bed in the high-risk pregnancy intensive care unit                 | 192 | 75.3 | P   | 113 | 70.6 | P   | 79  | 83.2 | RE  |
| In a bed in the neonatal intensive care unit                            | 80  | 31.4 | VP  | NA  | 80   | 84.2 | RE  |
| In the control center                                                   | 192 | 75.3 | P   | 113 | 70.6 | P   | 79  | 83.2 | RE  |
| In inter-hospital transport                                             | 191 | 74.9 | P   | 113 | 70.6 | P   | 78  | 82.1 | RE  |
| In blood banks                                                          | 77  | 30.2 | VP  | NA  | 77   | 81.1 | RE  |
| Avoidability classification                                             | 255 | 100.0 | E   | 160 | 100.0 | E   | 95  | 100.0 | E   |

Note: *classification; E = excellent; G = good; RE = regular; P = poor; VP = very poor; NA = not applicable.
DISCUSSION

The completeness of the research records was classified as “good,” and the comparison between components showed that almost all of the analyzed data blocks had better completeness in the perterm neonatal component. Data on stillbirths are usually deficient and of inferior quality, mainly in respect to sociodemographic and care-related information. The low quality of data on stillbirths limits its use for the proposition of actions directed at its confrontation.

The importance (or lack thereof) given to filling information on fetal mortality is one of the main factors associated with incompleteness of data. In Brazil, despite the declining trend of the stillbirth rate, it is still almost twice as high the one found in developed countries. In addition, mortality differentials between states are significant.

Most “identification” block data were rated as “excellent” in both components, similar to what was found by recent assessments of vital statistics information systems, which demonstrated improved data quality. After the implementation of infant and fetal death surveillance in Recife, confirmation of provided information became a requirement, and the proportion of blank and ignored fields was significantly reduced.

Regarding variables in the “prenatal care” block, “risk factors,” “personal antecedents,” “interval between the last two pregnancies,” “pre-gestational weight” and “maternal height” presented “very poor” completeness. Admittedly, data on pre-existing maternal conditions are poorly reported. While an interview with the mother is considered the gold standard for obtaining information on maternal behaviors, the inadequate completion of this information makes it difficult to understand the circumstances of death, the evaluation of the assistance offered to the pregnant woman and to the fetus or newborn, and the evaluation of socioeconomic conditions. This data could assist in interventions to reduce the occurrence of avoidable deaths.

A study carried out in Alagoas showed that the filling level of variables related to prenatal care was poor, and a study carried out in Pernambuco also pointed out a greater inadequacy of the prenatal care block in investigation sheets of a group of children who did not receive medical discharge after birth. Inadequate completion of information on prenatal care makes it difficult to assess maternal and child care, and perpetuates deficiencies mainly in primary care and in the prevention of avoidable deaths. In this sense, a study showed that mothers with inadequate prenatal care have a higher chance of death, and a recent evaluation of quality of prenatal care provided in the basic health network throughout Brazil revealed that only 15% of respondents received quality care according to the following parameters: number of visits, vaccination status, prescription of ferrous sulfate, physical examination, medical advice and complementary examinations.

Birth information obtained a classification of “good.” A systematic review study found that procedures and conditions that occur close to birth have more reliable records, probably due to better access to clinical records that make it possible to complete the information. At the national level, the Information System on Live Births (Sinasc) was evaluated as good quality and as having high completeness.

A hospital investigation of perinatal deaths in Ethiopia showed their avoidability, and that factors related to the health worker were the most commonly identified, followed by those referring to the patient and administrative factors. Measures to improve the quality of care are linked to the improvement of information quality and completeness, in order to allow the recognition of each health service’s current situation, allowing for the planning of adequate interventions.

Variables related to family characteristics were classified as “good.” The evaluation of the socioeconomic context in which death occurred contributes to the planning and implementation of intersectoral actions.

The completeness of data related to conclusions and recommendations was good, an indication that the completion of the investigation steps was satisfactory and provided an assessment of problems, as well as the suggestion of measures to prevent avoidable perinatal deaths. The change or correction of the cause of death can be considered indicative of the adequacy of infant death surveillance actions.

Limitations of this study

The study is limited by its use of a non-specific completeness score to evaluate perinatal death investigation sheets. However, the small number of studies analyzing the investigation sheet and its contribution to death surveillance attests this study’s relevance.

Contributions to the area of nursing, health or public policy

Complete epidemiological investigation optimizes the targeting of public resources and actions to reduce perinatal mortality. Analysis of completeness allows the evaluation of the information and contributes to its qualification. For the death investigation to be fully successful, it is essential for it to have reliable information, so that it can properly intervene on the identified gaps and propose effective measures for the prevention and reduction of perinatal mortality.

CONCLUSION

This assessment of the completeness of perinatal death investigation sheets ranked overall completion level as “good.” However, there are considerable differences in completeness between variables and components. In order for death surveillance to play its role of providing information on deficiencies in the maternal and child healthcare process and help direct interventions to the issue of avoidable deaths, it is crucial to ensure the proper filling out of the investigation sheet.

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Epidemiological investigation of perinatal deaths in Recife-Pernambuco: a quality assessment
Heráclio IL, Silva MA, Vilela MBR, Oliveira CM, Frias PG, Bonfim CV.

from research on infant mortality in Recife, Pernambuco, Brazil. Ciênc Saúde Colet[Internet]. 2018[cited 2018 Apr 12];23(3):701-14. Available from: http://www.scielo.br/pdf/csc/v23n3/en_1413-8123-csc-23-03-0701.pdf

21. Santos SLD, Santos LB, Campelo V, Silva ARV. Factors associated with infant mortality in a northeastern Brazilian capital. Rev Bras Ginecol Obstet[Internet]. 2016[cited 2017 Aug 20];38(10):482-91. Available from: http://www.scielo.br/pdf/rbgo/v38n10/0100-7203-rbgo-38-10-00482.pdf

22. Tomasi E, Fernandes PAA, Fischer T, Siqueira FCV, Silveira DS, Thumé E. Quality of prenatal services in primary healthcare in Brazil: indicators and social inequalities. Cad Saúde Pública[Internet]. 2017[cited 2018 Apr 12];33(3):e00195815. Available from: http://www.scielo.br/pdf/csp/v33n3/1678-4464-csp-33-03-e00195815.pdf

23. Correia LOS, Padilha BM, Vasconcelos SML. Methods for assessing the completeness of data in health information systems in Brazil: a systematic review. Ciênc Saúde Colet[Internet]. 2014[cited 2017 Aug 20];19(11):4467-78. Available from: http://www.scielo.br/pdf/csc/v19n11/1413-8123-csc-19-11-4467.pdf

24. Oliveira MM, Andrade SSCA, Dimech GS, Oliveira JCG, Malta DC, Rabelo Neto DL, et al. Evaluation of the National Information System on Live Births in Brazil, 2006-2010. Epidemiol Serv Saúde[Internet]. 2015[cited 2017 Aug 20];24(4):629-40. Available from: http://www.scielo.br/pdf/resv/v24n4/2237-9622-rev-24-04-00629.pdf

25. Delnord K. Linking databases on perinatal health: a review of the literature and current practices in Europe M. and the Euro-Peristat Scientific Committee. Eur J Public Health[Internet]. 2016[cited 2017 Sept 20];26(3):422-30. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4884328/pdf/ckv231.pdf

26. Marques LJP, Pimentel DDR, Oliveira CMD, Vilela MBR, Frias PG, Bonfim CVD. Agreement between underlying cause and preventability of infant deaths before and after the investigation in Recife, Pernambuco State, Brazil, 2014. Epidemiol Serv Saúde[Internet]. 2018[cited 2018 Apr 12];27(1):e20170557. Available from: http://www.scielo.br/pdf/resv/v27n1/en_2237-9622-rev-27-01-e20170557.pdf