RESEARCH

INVESTIGATION OF INFANT AND FOETAL DEATHS IN JEQUITINHONHA VALLEY, MINAS GERAIS, BRAZIL

INVESTIGAÇÃO DOS ÓBITOS INFANTIL E FETAL NO VALE DO JEQUITINHONHA, MINAS GERAIS, BRASIL

INVESTIGACIÓN DE LA MORTALIDAD INFANTIL Y FETAL EN EL VALLE DEL JEQUITINHONHA, MINAS GERAIS, BRASIL

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ABSTRACT

This study aims to analyse aspects related to the lack of investigation of foetal and infant deaths in the Valley of the Jequitinhonha in the state of Minas Gerais. This is an ecological study whose unit of analysis were the 33 municipalities in the Extended Jequitinhonha Health Region. A questionnaire was applied to a member of the Child and Foetal Death Prevention Committee of each municipality. The questions dealt with the committees' structure, mechanisms of infant death investigation, difficulties related to the investigation of deaths, and avoidable criteria between 2007 and 2012. A descriptive analysis with simple frequencies aiming at profiling the studied municipalities was performed. Of the 598 infant and 477 foetal deaths registered, only 22.2% and 18.4%, respectively, were investigated. The researchers detected that infrastructure, technical, operational and policy issues interfered with the investigation. Although required by law, the investigation over child and foetal deaths is deficient. This led to a large number of deaths being left uninvestigated. Such situation may hinder programmes for the reduction of infant and foetal mortality and the quality of childcare.

Keywords: Foetal Mortality; Infant Mortality; Professional Staff Committee.

RESUMO

Objetivo: *analisar os fatores relacionados à não investigação dos óbitos fetal e infantil ocorridos no Vale do Jequitinhonha, Minas Gerais.* ***Métodos:*** *trata-se de estudo ecológico que teve, como unidades de análise, todos os 33 municípios da Região Ampliada de Saúde Jequitinhonha, Minas Gerais. Nesses municípios foi aplicado um questionário a um membro do Comitê de Prevenção do Óbito Infantil e Fetal com questões sobre a composição dos comitês, mecanismos de investigação do óbito infantil, fatores dificultadores para a investigação dos óbitos e critérios de evitabilidade entre os anos 2007 e 2012. Foi feita análise descritiva com frequências simples, com o intuito de descrever o perfil dos municípios estudados.* ***Resultados:*** *dos 598 óbitos infantis e 477 fetais registrados, apenas 22,2 e 18,4% foram investigados, respectivamente. Constatou-se a existência de problemas de infraestrutura, técnico-operacionais e políticos que interferiram na prática de investigação.* ***Conclusão:*** *a operacionalização da investigação do óbito infantil e fetal, apesar de exigido por lei, apresenta deficiências, o que acarreta elevado número de óbitos não investigados no período do estudo, o que poderá comprometer as ações para a redução da mortalidade infantil e fetal e a qualidade da assistência infantil.*

Palavras-chave: *Mortalidade Fetal; Mortalidade Infantil; Comitê de Profissionais.*

RESUMEN

Objetivo: *Evaluar los factores relacionados con la falta de investigación de las muertes fetales y neonatales en el Vale de Jequitinhonha, Minas Gerais.* ***Métodos:*** *Se trata de un estudio ecológico, las unidades de análisis fueron los 33 municipios de la Región de Salud extendido Jequitinhonha, Minas Gerais. En estos municipios se aplicó un cuestionario a un miembro de la Prevención del Niño y el Comité de Muerte Fetal. Como instrumentos de recolección, se utilizó un cuestionario con preguntas sobre la composición de los comités, los mecanismos de investigación de muerte infantil, dificuladores factores para la investigación de las muertes evitables, entre otros criterios, entre los años 2007-2012, elaborado en base a la literatura y con la ayuda de expertos e investigadores en el área. El análisis se realizó mediante estadística descriptiva, con frecuencias simples, con el fin de describir el perfil de los municipios estudiados.* ***Resultados:*** *De los 598 niños y 477 muertes fetales registradas, sólo el 22,2% y 18,4%, respectivamente, fueron investigados. Encontrado la existencia de problemas de infraestructura, técnica-operativa y política interfirió con la práctica de la investigación.* ***Conclusión:*** *la puesta en práctica de la investigación en los niños y la muerte fetal, si bien exige la ley, presenta deficiencias que lleva un gran número de muertes no investigadas en el período de estudio, lo que puede comprometer las acciones para la reducción de la mortalidad infantil y fetal y la calidad del cuidado infantil.*

Palabras clave*: Mortalidad Fetal; Mortalidad Infantil; Comités de Profesionales.*

INTRODUCTION

Infant mortality (IM) is a global public health issue for managers, health professionals and society.[1] In Brazil the subject is in the spotlight after the country's engagement with the United Nations Millennium Development Goals (MDG), specially with goal number 4 (Reduce Child Mortality). This encouraged the Brazilian government to launch programmes such as the Pact to Reduce Maternal and Neonatal Mortality, the Pact for Life and, recently, the More Health Program.[2]

According to the MDGs National Monitoring Report[3], Brazil already achieved the goal of reducing infant mortality from 47.1 to 15.3 deaths per 1,000 live births. This rate exceeds the target of 15.7 estimated deaths for 2015 and puts the country ahead of other nation.[3,4] However, discrepancies in the rates of the Brazilian regions still persist. Such is the case of the Jequitinhonha Extended Health Region in Minas Gerais, which presents a high mortality rate, especially when compared to other states[I], as documented by the Informatics Department of the Unified Health System (DATASUS).[5]

Such state of affairs is worrying: on average, 60% of deaths of new-borns weighing more than 1,500 grams are preventable.[2,6] Preventable infant death is a "sentinel event alert" on the quality of the healthcare system and one of the cornerstones of health surveillance.[7,8]

Infant Mortality investigation is a key strategy for reducing infant mortality, given that it provides more visibility to the real situation of municipalities and guide local governments in the implementation of preventive and control measures.[9] Its use is highly recommended in the intervention planning and monitoring process. In 2004 the Department of Health launched the National Pact to Reduce Maternal and Neonatal Mortality and proposed the creation of the Infant and Foetal Death Prevention Committees in order to support epidemiological surveillance of deceases.[2,9] However, only in 2010 surveillance of infant and foetal death became mandatory within health services (public and private) part of the SUS.[10] The committee is supposed to investigate deaths, assess the conditions that favour their incidence, analyse preventability of death and define guidelines for interventions.[2,11,12]

The Jequitinhonha Extended Health Region encompasses 33 municipalities. Data from the Mortality Information System (MIS) demonstrated a low rate of investigations over infant and foetal deaths (20.5%) from 2007 to 2012.[5] The reasons behind the non-investigation are not known yet. It is, therefore, necessary to identify the factors that lead to poor investigation of infant and foetal deaths in such region. This study results are expected to contribute at improving the analysis of deaths within this age group.

METHODOLOGY

This is an ecological study that uses the 33 municipalities belonging to the Jequitinhonha Extended Health Region as analysis units. These are small sized municipalities with 3,661 to 47,803 inhabitants and a Human Development Index (HDI) averaging 0.707. The number of deaths from 2006 to 2012 was 477 of foetal deaths and 598 of infant deaths; out of these only 88 and 135, respectively, were investigated. The researchers evaluated information about the investigations on infant and foetal deaths through a questionnaire answered by a member of the Infant and Foetal Death Prevention Committee in each of the municipalities. When no committee was active in the municipality the authors interviewed those professionals indicated by the Local Health Department and/or by the Basic Health Care Coordinator to investigate the deaths.

The formulation of the questionnaire was based on the literature.[2,7,9] Three professionals were asked to validate the questionnaire. The modifications suggested by them were eventually accepted. Later the questionnaire was assessed by five experts for clarity, objectivity and relevance of assessment elements in their respective specialties. Representation and relevance regarding area of interest were also evaluated. Suggestions were accepted, respecting a minimum ratio of agreement of 80% for each question. The questionnaire included questions on the composition of committees, mechanisms for investigating infant deaths, as well as factors hindering investigations and avoidable criteria, among others.

Double data entry and subsequent pairing in Excel version 2010 was performed in order to identify errors, inconsistencies and missing data. The researchers used Statistical Package for Social Sciences (SPSS) version 21.0 to analyse data. Descriptive statistics with simple frequencies were performed in order to describe the profile of the studied municipalities. The project was approved by the Ethics Committee of the Federal University of Minas Gerais (COEP/UFMG) under protocol No 555,059.

RESULTS

Amongst the 33 municipalities studied, 19 had an Infant and Foetal Death Prevention Committee; of those 14 were not active. In such cases and in those with no committee, investigation and analysis of infant and foetal deaths were conducted by a Family Health Strategy (FHS) nurse (n = 24) not participating in the committee (Table 1).

The same was observed regarding hospital committees, found in 12 municipalities; the remaining 21 had no maternity unit or hospital to perform deliveries. Even though there was a committee, the investigation was conducted mostly by FHS nurses, employees at the hospital where death occurred or a member of the hospital committee (Table 1).

There was an overall lack of knowledge about the duties of the Infant and Foetal Death Prevention Committee. In most cases (n = 21) targets agreed with by the State Government (mainly related to the minimum percentage of investigation)

were incorrectly emphasized. The majority of municipalities did not take into consideration investigation and analysis of deaths, prevention of further incidences, professional's encouragement and attentiveness as to the importance of keeping a proper record of cases (Table 2).

Table 1 - Operationalization of the Infant and Foetal Mortality Prevention Committee – Jequitinhonha Extended Health Region, Minas Gerais, 2014 (n = 33)

Variables	N	%
Is there a local committee?		
No	14	42.4
Yes	19	57.6
Is the committee active? n=19		
No	14	73.6
Yes	5	26.4
Professional performing investigation*		
Committee member	9	27.7
FHS nurses	24	72.3
Is there a committee or hospital employee to carry out investigation?*		
No	21	63.6
Yes	12	36.4
Reasons for the non-existence of either committee or hospital investigation*; a; d; n= 21		
No deliveries are made in the municipality	20	95.0
Unknown reasons	1	5.0
Professional responsible for the hospital investigation*; a; d		
FHS nurse	26	78.8
Employee at the hospital where death took place	23	67.7
Committee member	11	33.3
SRS (Regional Health Inspectorate) employee	3	9.1
Professional responsible for domiciliary investigations*		
Committee member	5	15.2
FHS nurse	28	84.8
Professional responsible for outpatient unit investigations*		
Committee member	5	15.2
FHS nurse	28	84.8

*Research in infant and foetal deaths; amore than one answer by individual; d other less frequent options were not inserted in the table.

Several obstacles were identified during the research, namely: lack of financial support and human resources; missing hospital data; lack of staff training. It is very difficult to get hold of documents needed to complete the investigation, for instance, hospital records and DCs (Table 2). The latter is of great importance because it notifies and triggers the investigation process. Most of the cities studied did not receive the DC in the faster printed form. Sometimes the DC was inserted into the WEB SIM module, but data entry in the information system was generally too slow. This hindered the cities compliance with the maximum period of 120 days imposed by the state government to carry out investigations.

Table 2 - Difficulties faced by the Infant and Foetal Mortality Prevention Committee – Jequitinhonha Extended Health Region, Minas Gerais, 2014 (n = 33)

Variables	N	%
Committee Assignments a; d		
Investigation	3	9,1
Survey problems and proposed solutions	5	15,2
Do not know – achievement of goals	21	63,6
Obstacles during investigations*; a; d		
No obstacles	5	15,1
Lack of SRS support	24	77,4
Incomplete hospital records	19	61,3
Lack of staff training	18	58,1
Difficulty to access hospital data	18	58,1
Lack of supervision by local and state management	18	58,1
Lack of support on the part of working professionals	17	54,8
Lack of human resources	17	54,8
Doubts on how to fill out domiciliary investigation forms*		
No	9	27,3
Yes, but cannot define it	18	54,6
Depends on the case being investigated	6	18,1
Doubts on how to fill out the form for ambulatory investigation*		
No	16	48,5
Yes, but cannot define it	11	33,4
Depends on the case being investigated	6	18,2
Doubts on how to fill out form for hospital investigation*		
No	5	15,2
Yes	25	75,7
Depends on the case being investigated	3	9,1
Difficulty to access documents a; d		
Access to hospital records	26	89,7
Death Certificate (DC) filled out properly	23	79,3
Access to hospital records properly completed	21	72,4
Access to Death Certificate (DC)	14	48,3

* Investigation of infant and foetal deaths; a more than one response per interviewee; d less frequent options were not inserted in the table.

Investigation into infant and foetal deaths depends on a survey of household, outpatient and inpatient data. However,

filling out the forms, especially those related to a hospital investigation, was quite difficult (Table 2). Despite being a reference to the municipalities, the Regional Health District could not always address the participants' doubts which resulted in a high number of blank forms or in making it impossible to carry out the investigation.

Given this scenario, local management should help and insist on carrying out the investigation processes by offering training courses for professionals working on the area, as well as better structure and coordination from the Regional Health Department. It is important to point out that local management support (that is, local government) on human, physical and material resources was observed in only one municipality, although all the municipalities involved were well aware of its importance (Table 3).

Table 3 - Local government actions respecting the practices of Infant and Foetal Mortality Prevention Committees and hospital committees – Jequitinhonha Extended Health Region, Minas Gerais, 2014 (n = 33)

Variables	N	%
Local governments encouraging investigations*		
No	32	97,0
Yes	1	3,0
Local governments favouring investigations* [a; d]		
No need	5	15,2
Training of professionals involved	19	67,9
Insist on better structure	19	67,9
Request help and advice	18	64,3
Insist on investigations of deaths*	16	57,1
Improvement of collection of wrong/incomplete hospital data	15	53,6

* Investigation on foetal and infant deaths; [a] more than one answer per participant; d less frequent options were not included in the table.

Difficulties in the classification of deceases according to preventability were observed. In general, the professionals who carried out the investigation in the municipalities did not know how to do it (n = 24). In seven municipalities, criteria were employed only after a 2013 training course promoted by the Regional Department of Health. After that, professionals started to recognize its importance. All municipalities using preventability criterion (n = 9) followed the classification recommended by the National Department of Health (Table 4).

The researchers found out that 28 municipalities had trouble entering and/or correcting data in the Infant Mortality Information System based on the Infant and Foetal Death Investigation Form. People were not trained to carry out this stage of the investigation and there was no support from medical staff in order to include or correct data in the DC after investigation (only such professional is allowed to change data).

Table 4 - Preventability criterion applied to infant and foetal deaths – Jequitinhonha Extended Health Region, Minas Gerais, 2014 (n = 33)

Variables	N	%
Preventability criterion		
No	24	72,7
Yes	1	3,0
Partially	1	3,0
Only in recent deceases	7	21,2
Reason for applicability in recent deceases [a; n= 7]		
Training	7	100,0
Its importance was only recently recognised	6	85,7
Pressure to carry it out	4	57,1
Just recently found out of its use being mandatory	3	42,9
Applied criteria [a; n= 9]		
Brazilian listing	9	100,0
Seade	7	77,8
Wiggleswoth	2	22,2
Debate amongst members over the use of preventability criterion [n= 9]		
No	3	33,3
Yes	6	66,7
Reason for lack of debate amongst members over use of preventability criterion [a; d; n= 3]		
Criterion as an individual choice	1	33,4
Not all members know how to use it	2	66,6

* Investigation on infant and foetal death; [a] more than one answer per participant; d less frequent options were not included in the table.

As part of infant and foetal death surveillance, analysis of collected data and its results should be forwarded to health managers. Twenty-six municipalities in the studied region did not disclose data collected and evaluated to health services, managers and the general public.

DISCUSSION

The study results enabled the researchers to evaluate the factors that influence and determine the investigation into infant and foetal deaths. The implementation of committees to investigate the deaths is of great importance for the understanding of the circumstances of their occurrence, risk factors and for the definition of health policies aimed at reducing maternal and infant mortality.[2]

The study results found that there were some cities that did not have a committee and that when they existed most of them were not active. This reflects the low rate of investigations carried out or that such investigations are conducted by professionals outside the Epidemiological Surveillance Team or the Hospital Centre for Epidemiology (HCE). According to the National

Department of Health, Ordinance No 72/201010, the committee, along with the surveillance team and the (HCE) in the case of hospital investigation, is responsible for the analysis, discussion and conclusion of the deaths under investigation.[2,13-15]

Such interventions aim at assessing problems, optimizing work processes and organizing services in order to prevent recurrence, promote the immediate correction of the potential causes of death, as well as raise awareness amongst those directly involved with the caring and the recording of the occurrences.[16-20] In order to carry out these activities, whatever the formation of the investigation team, these must be the result of a coordination between public and private sectors. It should be carried out preferably by a group of professionals not directly involved with the caring and death processes [2,10] and not by only one individual, as it happened in the cities studied. [21-25]

In these municipalities, the investigation process was centred mainly on the ESF nurses, even when there was a committee. It is possible that the team in charge of the investigations was unaware of the operational changes that trust the Epidemiological Surveillance team of Infant and Foetal Death to coordinate the investigation process.[10] Such team was not established in any of the municipalities.

The lack of knowledge about the committee's functions might be because the Department of Health Resolution No. 5/2013[13] rules over the agreement over guidelines, goals, targets and indicators for years 2013-2015. It establishes a minimum percentage of investigations that, in the case of the study area, is 35%.

Such results demonstrated the need for professional awareness about the concept and the importance of the investigation of infant and foetal deaths, the role of the Infant and Foetal Death Prevention Committee and investigation team. Surveillance over infant death gives visibility to actual mortality rates and is an important strategy to reduce death within that group. It contributes to the improvement of the registration of deaths and enables the adoption of measures for the prevention of avoidable deceases. These actions go far beyond compliance with government targets. Despite the focus on the achievement of goals in the municipalities studied, the investigated deceases fall short of the minimum target set by the Department of Health. The same state of affairs is to be found in other cities, for example, in the state of Paraná.[14]

Obstacles to the investigations – e.g. lack of SRS support (financial and human resources) – highlight that structural and health care actions should also be constantly revised. The regional health district plays an important role in assessing local indicators, targeting goals, aiming at a participatory management, defining co-responsibilities in health and implementing health promotion activities. Therefore, the SRS should be receptive to social changes and fulfil its role as a health promotion agent; it should consider the social contexts and the construction of health co-management, with the participation of different players (workers, users, and local managers of the health system) in the health system management.

Problems with the filling out of documents, chiefly death certificates and medical records, are a constant hindrance to the process. It is a recurrent problem in other cities as well. [2,13,17,18,20,21] Access to medical records, and illegibility and non-filling or incomplete filling out of the various fields, limit the analysis of the quality of care.[22]

The incorrect filling out of DC is, according to other studies,[22,23] due to the fact that the Department of Health divided its variables in *indispensable*, *essential* and *secondary*, which may have contributed to downplay the importance of secondary variables what may explain it not being reported. Another reason may reside in the curricula of medical schools that do not emphasize the importance of adequate filling of vital records. There is little appreciation of the CD as an epidemiologically relevant document.[21,23] Its record is generally considered a purely bureaucratic and administrative act.[18] According to Decree No. 11,976 from 2009[24], doctors must certify the death using the CD form. Errors, inaccuracies or omissions are punishable in accordance with the Penal Code and the Medical Council regulations.[25] The quality improvement of DC and medical records is imperative.

Data inclusion and correction in the Mortality Information System is another complication. As a result, completion of forms is not done correctly or, even more significant, the investigation is not carried out. Training of the staff involved in investigation and the insertion of a doctor in the team (the single professional able to make such changes) would certainly fill many gaps of knowledge on the circumstances of infant and foetal death.

The results found here do not match the standards of the Department of Health, which states that those responsible for surveillance and investigation should be given appropriate training, especially as regards to surveillance tools, investigation records, summary records and municipal spreadsheet.[19] Proper training means that a proper investigation process can be carried out and this could influence the reduction of the infant mortality rate. Therefore, the municipalities need to be more aware of the need of training those involved in the investigation process, so they can gather more reliable, and simple data on the target areas for prevention.

Knowledge of aspects relating to infant and foetal mortality in the cities, states and especially in the country as a whole is essential, especially in the realm of public health. It is also undeniable that incorrect or incomplete data can cause disruptions to a greater or lesser extent. Lack of information can also influence the number of deaths from poorly defined causes and its reducibility.[21-23]

The period between the date of death and the investigator's access to information about the event was excessively long. Deadline for survey data completion, i.e. debate, analysis, conclusion of the case and remittance of Infant and Foetal Death Investigation Form to the local Health Department is 120 days at most from the date of the occurrence.[2] Other studies demonstrate that the quality of information is related to a higher speed for data retrieval, which reduces inconsistencies and distortions of the time lag between the occurrence and the correction and updating of data, and possibly helps to reduce new cases.[19] This problem could be solved through the implementation of epidemiological surveillance teams and hospital epidemiology centres, not present in the assessed region.

Upon completion of the investigation, the death surveillance team or committee should hold discussions with all professionals involved, in order to analyse comprehensively and thoroughly each case and debate about preventability of death. The use of death preventability criteria regulated for more than 10 years by Ordinance No. 1121 from 2002 that establishes the Pact of Primary Care Indicators is extremely important. [16] The investigation can help to identify risk factors, to evaluate critically the case and to promote a shared reflection on death prevention through health services programmes in order to prevent future deceases from similar causes.[2,15] The research data indicated, however, the municipalities' low adherence to criteria, justified by the lack of knowledge and training, which differs from the experience of other states.[13,16]

In order to reduce infant and foetal deaths, the authors recommend such events should be referred to all-levels health managers, as part of the surveillance process, as well as the dissemination of information on the findings of the investigations. Preventive measures should be specified so as to prevent the recurrence of potentially avoidable deaths and intervention procedures should be established for the reorganization of care. Such was not the reality found in the municipalities studied, perhaps due to the limited number of professionals able to carry out investigations.

CONCLUSION

The present study demonstrated that the epidemiological surveillance teams of Infant and Foetal Death are not implemented in most municipalities. Committees and Hospital Epidemiology Centres operate only partially. This scenario prevents the collection, analysis and dissemination of information.

Furthermore, the results reveal the need for coordinated actions between health professionals, managers and society in order to reinforce the practice of investigations. Difficulties on the surveillance of deaths and organization of investigative efforts were observed. It is imperative that such obstacles should be immediately overcome if child mortality is to be reduced.

The lack of equipment and administrative structure, as well as isolated and individual actions carried out by the FHS nurses or small groups without support from higher levels of hierarchy, show fragile investigative capacity in the Jequitinhonha Extended Health Region. Investigations require qualified professionals with clear responsibilities and adequate infrastructure; the professionals should have their actions or recommendations backed by local, regional and state management. This would enable the assessment of structure, processes and outcomes and allow for necessary adjustments.

The limitation of the study was the use of a questionnaire as a single data collection instrument. The use of printed material and other data provided by the municipalities in relation to the individuality of each inquiry process could have added value to the study. This was due to the significant number of cities to be visited, the geographical distance between them and the deadline for data collection.

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