EARLY AND LATE NEONATAL DEATH: CHARACTERISTICS OF MOTHERS AND NEWBORN[a]

Maria Aparecida Munhoz GAÍVA[b], Rossana Marchese BITTENCOURT[c], Elizabeth FUJIMORI[d]

ABSTRACT

The aim of the study was to analyze the profile of mothers and newborns who died in the early and late neonatal period. Descriptive, exploratory cross-sectional study that used secondary data obtained from the information systems of mortality, births and hospital records of mothers living in Cuiabá, who gave birth in 2010. We studied 77 deaths, of which 72.7% occurred in the early neonatal period. The early and late neonatal mortality rates were, respectively, 8.2, 6,0 and 2,2/1,000 live births. No difference was found in the profile of mothers and newborns who died in the early or late neonatal period. Characteristics that prevailed among the neonatal deaths were less than 7 prenatal visits, prematurity, low birth weight and Apgar score less than 7 at 1 minute. These results indicate the need for investment, especially in improving the quality of prenatal care in the city.

Descriptors: Infant mortality. Risk factors. Live birth. Information systems. Nursing

RESUMO

O objetivo do estudo foi analisar o perfil das mães e dos recém-nascidos que foram a óbito no período neonatal precoce e tardio. Estudo descritivo-exploratório de corte transversal, que utilizou dados secundários obtidos dos sistemas de informação de mortalidade, de nascidos vivos e prontuários hospitalares de mães residentes em Cuiabá (MT), que deram à luz no ano de 2010. Foram estudados 77 óbitos, sendo que 72,7% ocorreram no período neonatal precoce. Os coeficientes de mortalidade neonatal, precoce e tardio foram, respectivamente, 8,2, 6,0 e 2,2/1.000 nascidos vivos. Não se constatou diferença no perfil materno e dos recém-nascidos que foram a óbito no período neonatal precoce ou tardio. Características que prevaleceram entre os óbitos neonatais foram: realização de menos de 7 consultas pré-natais, prematuridade, baixo peso e Apgar menor que 7 no 1º minuto. Tais resultados indicam a necessidade de investimentos, especialmente na melhoria da qualidade da assistência pré-natal no município.

Descritores: *Mortalidade infantil. Fatores de risco. Nascimento vivo. Sistemas de informação. Enfermagem.*
Título: *Óbito neonatal precoce e tardio: perfil das mães e dos recém-nascidos.*

RESUMEN

El objetivo del estudio fue analizar el perfil de las madres y los recién nacidos que murieron en el período neonatal precoz y tardíamente. Estudio exploratorio descriptivo de corte transversal que utilizó datos secundarios obtenidos de los sistemas de información de mortalidad, nacimientos y los registros hospitalarios de las madres que viven en Cuiabá, que dieron la luz en 2010. Se estudiaron 77 muertes, el 72,7% se produjo en el período neonatal temprano. Las tasas de mortalidad neonatal, precoz y tardía, fueron, respectivamente 8,2, 6,0 y 2,2/1.000 nacidos vivos. No hubo diferencias en el perfil materno y de recién nacidos que murieron en el período neonatal temprano o más tarde. Características que prevalecieron entre las muertes neonatales fueron: se realizaron menos de 7 visitas prenatales, partos prematuros, bajo peso al nacer y la puntuación de Apgar inferior a 7 al 1 minuto. Estos resultados indican la necesidad de inversión, sobre todo en la mejora de la calidad de la atención prenatal en la ciudad.

Descriptores: *Mortalidad infantil. Factores de riesgo. Nacimiento vivo. Sistemas de información. Enfermería.*
Título: *Muerte neonatal temprana y tardía: características de las madres y de los recién nacidos.*

---

a Article originated from a dissertation submitted to the Postgraduate Program in Nursin at the School of Nursing of Universidade Federal de Mato Grosso (UFMT) in 2012.

b PhD in Nursing,Associate Professor 2 at the Schoool of Nursing of UFMT. Cuiabá, MT, Brazil. Leader of the Research Group Project Argos. CNPq Researcher.
c Nurse. Master in Nursing. Professor at University Center UNIRONDON Cuiabá, MT. Brazil..
d PhD in Nursing Associate Professor 3 of the Department of Nursing in Collective Health of the School of Nursing of Universidade de São Paulo. São Paulo. Brazil. CNPq Researcher.

Versão on-line em Português/Inglês: http://www.scielo.br/scielo.php?script=sci_serial&pid=1983-1447&lng=pt&nrm=iso

INTRODUCTION

Infant mortality refers to deaths of children under 1 year of age, subdivided into neonatal mortality (deaths from 0-27 days of age) and post-neonatal mortality (deaths from 28-364 days of age). Neonatal mortality is divided into two periods: early neonatal mortality (0 -6 days) and late neonatal mortality (7-27 days of age)[1].

Since 1983, the percentage of neonatal deaths in Brazil has been oscillating between 54% and 70% of the total infant mortality and accounts for more than 60% of child deaths from the second half of the 1990's. Besides, more than 70% of these deaths occur in the early neonatal period, with greater prevalence in the first 24 hours of age[1].

According to the literature, neonatal deaths are closely related to the living and health conditions of the mother, but are mostly related to the care provided during pregnancy, childbirth, postpartum and also the immediate care given to the newborn[2-4].

In fact, studies show that more than 70% of neonatal deaths are due to preventable causes, especially the lack of adequate care for the pregnant woman and the newborn[5-6]. Some variables such as low weight (< 2.500g) and prematurity (gestational age < 37 weeks) are statistically associated to neonatal mortality, with a risk of death 44 and 50 times greater than the other newborns[7]. Likewise, there is evidence that the risk of death is 54 and 125 times greater when Apgar scores at 1 and 5 minutes after birth are less than 7[7].

The results of the socioeconomic policies and the advances and setbacks of the assistance provided by health care services reflect directly on neonatal mortality rates and their determining factors. To meet the challenge of reducing neonatal deaths related to the care provided to women during the gestational period and of timely accessing proper health care services during delivery and birth, the Ministry of Health created, in 2011, a care network aimed to provide proper assistance during prenatal, delivery and neonatal period (Cegonha Network)[8]. With the introduction of this new model of healthcare, the government intends to improve the high-risk obstetric services, increase the number of hospital beds under Brazil's Unified Public Health System (SUS), as well as ensure better training to healthcare professionals that assist pregnant women and newborns.

Since neonatal mortality in Brazil is not evenly distributed and that several complex factors are associated with deaths in the first month of life, these deaths should be considered according to the period of occurrence (early or late), including identification of the mother and the newborn baby. Therefore, this study aimed to analyze the profile of mothers and of newborns that died in the early and late neonatal period in Cuiabá-MT. Such information provides important indicators that can be used in the monitoring of deaths and the planning of health actions, aiming at reducing neonatal mortality[2,4].

METHOD

This is a descriptive, exploratory cross-sectional study[9] that examined all babies born in Cuiabá, MT, in 2010, to mothers resident in this city and who died in the neonatal period (up to 27 days of life). Thus, the deaths occurred from January 1st , 2010 to January 27, 2011.

The death certificate (DC), the live birth records (LB) and the hospital records of the mother and the newborn were the sources of data collection, which was performed from January to February 2011 using a form designed for the research. First, all deaths of babies born alive in 2010 were identified through analysis of death certificates, and, subsequently, an analysis of the records of live-born children who died within the first month of life was performed. The medical records of all neonates that died within the first month of age in the local hospitals were compared.

Analysis of neonatal deaths considered those occurring in the early neonatal period (up to 6 days of age) and late neonatal period (7 to 27 days of age)[1]. The maternal characteristics analyzed were: age (<20, 20 years or older); education (< 8 and ≥ 8 years or more); marital status (married/stable union and single); number of prenatal consultations (none, 1 to 4, 4 to 6 and 7 or more); parity (primiparous and multiparous); type of pregnancy (single or multiple); and type of delivery (vaginal or c-section). The infant characteristics analyzes were: sex (male and female); gestational age (<37 and 37 or more weeks); birth weight (<2.500 grams and 2.500 grams o more); Apgar score at 1 and 5 minutes (< 7 and 7 or more).

Versão on-line em Português/Inglês: http://www.scielo.br/scielo.php?script=sci_serial&pid=1983-1447&lng=pt&nrm=iso

The software *Statistical Package for the Social Sciences* (SPSS) for Windows, version 15.0 was used for data processing and analysis. Chi-square test was used to investigate a possible association between early neonatal death and maternal and infant characteristics. Fisher test was used when the expected frequency for the variables was less than one or when more than 20% of the expected frequencies were less than five. The level of significance was 5%, that is, the null hypothesis was rejected when p-value was less than 5% (Type I error).

The study was approved by the Research Ethics Committee of Hospital Universitário Júlio Müller, opinion no 968/CEP-HUJM/2010, according to the guidelines of Resolution 196/96 of the National Health Council.

RESULTS

In 2010, 9,342 children were born alive to mothers resident in the city of Cuiabá, MT and 123 of them died in the first year of life. The infant mortality rate was 13.1 deaths/1,000 live births (LB). Of these deaths, 46 (37.4%) occurred in the pos- neonatal period (4.9 deaths/1,000 LB) and 77 (62.6%) occurred in the neonatal period (8.2 deaths/ 1.000/LB, 56 (72.7%) in the early neonatal period and 21 (27.2%) in the late neonatal period, which resulted in coefficients of 6.0 deaths/1,000 LB in the early neonatal period and 2.2 deaths/1,000 LB in the late neonatal period). Most deaths were found to occur in the first 24 hours of life (46.9% of the early deaths).

The sociodemographic and gestational profile of the mothers did not differ statistically between the early and late deaths (p>0.05). However, it is important to highlight the prevalence of neonatal deaths among mothers with more than 8 years of education and cesarean delivery. Also, a high percentage of mothers with less than 7 prenatal appointments were observed in both groups (Table 1).

According to Table 2, there is no statistical different in the profile of neonates who died in the early or late neonatal period. However, most neonates who died were male (61.0%) with high percentage of premature births (75.3%) and low weight (72.7%), as well as newborns with Apgar score < 7 in the first minute, particularly among those who died in the early neonatal period.

DISCUSSION

Increase in neonatal deaths and decrease in post-neonatal deaths is observed around the world, accounting, since the 1970's, for more than 50% of infant mortality in Brazil[1]. In Cuiabá, in 2010, neonatal deaths accounted for more than 60% of infant deaths, which is very significant and reproduces the national data from 2009 [10] and is also similar to findings in developed countries such as Canada (58%)[11]. However, in poor countries of Africa, neonatal deaths account for slightly more than 30% of infant mortality, in view of the unfavorable living and health conditions of the population that elevate post-neonatal mortality[11].

Nevertheless, neonatal mortality rate of Cuiabá (8.2 deaths/ 1,000 LB) is considered high compared e.g. to the rates of Spain (2.3 deaths/1,000 LB) and Japan (1.5 deaths/ 1,000 LB), although much lower than rates of countries such as Equatorial Guinea and Afghanistan (44.4 and 56.0 deaths/ 1,000 NV, respectively[12] .

Regarding the period of neonatal mortality, in Cuiabá a high percentage of deaths was found to occur in the early neonatal period, i.e., in the first week of life (72.7%), in the same way as in Brazil, in 2008, when 75% of the deaths in the first month of life occurred in the early neonatal period[1]. Most early neonatal deaths occurred in the first 24 hours (46.9%). In Salvador- BA, neonates less than 24 hours of age accounted for 34.5% of early neonatal deaths in 2008[13].

In fact, relevant studies show that more than 70% of the deaths occur in the early neonatal period due to preventable causes, especially lack of adequate care for the pregnant woman and the newborn and failure in early diagnosis and treatment [14-15]. Moreover, some maternal, infant and health care assistance-related aspects also contribute to these deaths[14-15]. Although this study has not found a statistically significant association between early or late neonatal deaths and the profile of mothers and infants, some characteristics prevailed among neonatal deaths, such as less than seven prenatal visits, prematurity, low birth weight and Apgar score less than 7 at 1 minute[4,7].

Most characteristics are associated to the quality of the care provided to the pregnant woman in the prenatal period and during delivery and to the newborn[3-4].

Table 1 – Sociodemographic and gestational profile of mothers according to the neonatal death period. Cuiabá, MT, 2010.

Variables	Neonatal death		Total N=75* n (%)	p-value
	Early n (%)	Late n (%)		
Age (years)				0.848
< 20	16(29.6)	6(28.6%)	22(29.3)	
≥ 20	38(70.4)	15(71.4%)	53(70.7)	
Marital status†				0.215
Married/stable union	29(54.7)	7(35.0)	36(49.3)	
Single	24(45.3)	13(65.0)	37(50.7)	
Education (years)				0.049
< 8	10(18.5)	9(42.9)	19(25.3)	
≥ 8	44(81.5)	12(57.1)	56(74.7)	
Type of gestation				0.568§
One	50(92.6)	20(95.2)	70(93.3)	
Double	4(7.4)	1(4.8)	5(6.7)	
Type of delivery				0.465
Vaginal	24(44.4)	12(57.1)	36(48.0)	
C-section	30(55.6)	9(42.9)	39(52.0)	
Number of prenatal appointments‡				0.778
None	3(5.7)	1(4.8)	4(5.4)	
1-4	7(13.2)	2(9.5)	9(12.2)	
4-6	27(50.9)	10(47.6)	37(50.0)	
≥ 7	16(30.2)	8(38.1)	24(32.4)	
Parity				0.503
Primiparity	27(50.0)	13(61.9)	40(53.3)	
Multiparity	27(50.0)	8(38.1)	35(46.7)	

*Two mothers had twins; †Two mothers without information ‡ one mother without information; § Fisher test.

Low birth weight and prematurity are the most important characteristics because they aggravate the health of newborns and contribute to early death[7,14]. This situation was reported in the present study, because most infants were premature and with low birth weight.

The incidence of newborns with low weight and preterm births is related to antenatal maternal health conditions and to the quality of prenatal care. The neonatal mortality of infants under such conditions, however, depends on the immediate neonatal care in the delivery room and in neonatal intensive care units, particularly in the first week of life, the period of greatest vulnerability[2]. Besides, it is known that the appropriate use of corticosteroids and surfactant administration reduces early neonatal mortality, indicating adequate neonate attention.[16].

An Apgar score of less than 7 at 1 and 5 minutes is one of the risk factors most strongly associated with neonatal death[2,15]. Proposed by Virginia Apgar, this is a parameter used to determine whether a newborn suffers from asphyxia and requires resuscitation. A low Apgar score (less than 7) indicates that the newborn requires immediate assistance to minimize the consequences of lack

Table 2 – Profile of neonates according to the neonatal death period. Cuiabá, MT, 2010.

Variables	Neonatal death		Total N=77 n(%)	p-value
	Early n(%)	Late n(%)		
Sex				
Male	35(62.5)	12(57,1)	47(61.0)	0.867
Female	21(37.5)	9(42.9)	30(39.0)	
Duration of gestation				
< 37 weeks	42(75.0)	16(76.2)	58(75.3)	0.850
≥ 37 weeks	14(25.0)	5(23.8)	19(24.7)	
Birth weight				
< 2500g	42(75.0)	14(66.7)	56(72.7)	0.657
≥ 2500g	14(25.0)	7(33.3)	21(27.3)	
Apgar 1min				
< 7	44(78,6)	12(57.1)	56(72.7)	0.111
≥ 7	12(21.4)	9(42.9)	21(27.3)	
Apgar 5 min				
< 7	29(51.8)	7(33.3)	36(46.8)	0.234
≥ 7	27(48.2)	14(66.7)	41(53.2)	

of oxygen in the brain. In the present study, this was one of the most important variables for early neonatal deaths.

The increased risk of neonatal death by asphyxia/hypoxia may be related to the quality of care provided during the prenatal period and delivery. Most of these deaths are preventable and their reduction remains a major challenge, especially in developing countries that lack well-trained staff and technology for appropriate care.[17]. Mortality rates caused by asphyxia are therefore a sensitive indicator of the quality of the care provided during delivery and birth[17].

Although prenatal and hospital care to the mother and the newborn are key determinants, biological characteristics and aspects related to the social status of the mother have been associated to neonatal mortality, as follows: low educational level, absence of a partner, very high maternal ages, high parity and pregnancy disorders[7]. Despite the evidence in the literature, this study found no association between neonatal mortality and maternal profile.

However, a survey that analyzed the risk factors for infant mortality in the city of Cuiabá, MT, in 2005, found an association between neonatal death with the following maternal variables: less than 4 prenatal visits, vaginal delivery, pregnant women younger than 20 years of age and multiple births[18].

Maternal education is an indirect factor of the socioeconomic conditions of the family and a risk predictor of neonatal mortality[10]. One study demonstrates that the higher the education level of the mother, the lower the risk of neonatal death[13]. Nevertheless, this association was not observed in Cuiabá, possibly because most mothers had at least 8 years or of schooling or more, i.e., had at least elementary education.

Another significant variable associated to neonatal death is the type of delivery. Some Brazilian studies have shown a greater percentage of deaths in infants whose mothers had vaginal delivery [4,7], while cesarean section has been considered a protective factor for mortality[4], especially for premature and low-weight neonates[19]. However, this relationship was not observed in the present study.

The high number of cesarean sections performed in Brazil is a matter of concern. In 2007, this percentage was 47%, well beyond the maximum limit of 15% recommended by the World Health

Organization[20]. In Cuiabá, more than half of the newborns that died in the first week of life (55,6%) were born by cesarean section, which, is known to be a risk factor for the mother and the infant when done indiscriminately, for it increases the change of premature deliveries and low birth weight, increasing the risk of neonatal death [10].

In turn, prenatal care, represents the most important protection for neonatal and infant survival, a situation confirmed by this study and by another study that reported an association between insufficient number of prenatal visits and increased neonatal deaths by up to 11.6 times[13]. In the present study, although most mothers made less than 7 prenatal clinic appointments, there was no association between this variable and neonatal deaths. However, it should be noted that this may have happened because more than 70% of the neonates were born prematurely.

Most characteristics associated with the profile of the studied population could be prevented with the adoption of measures that successfully fight neonatal mortality. Low birth weight, for example, can be understood as a sentinel event for healthcare services, which indicates the low quality of prenatal care and the need for training the staff in order to improve the identification of and the care provided to these group of patients. Besides, other actions such as increased access to prenatal care, compliance with protocols, use of the proper criteria for high risk pregnancies, suggested by the Ministry of Health, could directly reduce low birth weight and low Apgar scores.

Finally, it should be noted that the nurse, who is involved in several areas of care and management of health services, is able to promote actions that contribute to the reduction of health inequalities, favoring greater neonatal survival.

CONCLUSIONS

Although no statistically significant difference was found between the profile of the mothers and of the infants who died in the early or late neonatal period, the results showed that less than 7 prenatal visits was one of the most important characteristics of the mothers of infants who died in the study period. Prematurity, low birth weight and Apgar score less than 7 at the 1st minute of life were the most significant characteristics of the neonates. These findings indicate the need for investments, especially in the improvement of prenatal care in the city.

Despite its limitations, due to the use of secondary data, the present study helped understand the behavior of neonatal mortality and the profile of the mothers and infants who died in the study period, aimed to support the planning of nursing care during the prenatal period and delivery in the context of primary and hospital care. Furthermore, the results point to the need for monitoring neonatal mortality in the city, and can be used to assess the quality of health services.

REFERENCES

1 Ministério da Saúde (BR). Manual de vigilância do óbito infantil e fetal e do comitê de prevenção do óbito infantil e fetal. Brasília (DF): Ministério da Saúde; 2009.

2 Fréu CM, Mottin LM, Migotti MD, Martinelli IB, Nunes ML, Geib LTC. Determinantes da mortalidade neonatal de uma coorte de nascidos vivos em Passo Fundo – RS, 2003-2004. Rev AMRIGS. 2008;52(2):97-102.

3 França E, Lansky S. Mortalidade infantil neonatal no Brasil: situação, tendências e perspectivas. In: Organização Panamericana de Saúde (OPAS), Rede Interagencial de Informações para Saúde. Demografia e saúde. contribuição para análise de situação e tendências. Brasília (DF): OPAS; 2009. p. 83-112.

4 Soares ES, Menezes GMS. Fatores associados à mortalidade neonatal precoce: análise de situação no nível local. Epidemiol Serv Saúde [Internet]. 2010 [citado 2012 Out 20];19(1):51-60. Disponível em: http://scielo.iec.pa.gov.br/pdf/ess/v19n1/v19n1a07.pdf.

5 Rocha R, Oliveira C, Silva DKF, Bonfim C. Mortalidade neonatal e evitabilidade: uma análise do perfil epidemiológico. Rev Enferm UERJ. 2011;19(1):114-20.

6 Gorgot LRMR, Santos I, Valle N, Matisajevich A, Barros AJD, Albernaz E. Óbitos evitáveis até 48 meses de idade entre as crianças da Coorte de Nascimentos de Pelotas de 2004. Rev Saúde Pública [Internet]. 2011 [citado 2012 Out 04];45(2):334-342. Disponível em: http://www.scielo.br/pdf/rsp/v45n2/2018.pdf.

7 Maran E, Uchimura TT. Mortalidade neonatal: fatores de risco em um município no sul do Brasil.

Rev Eletr Enferm [Internet]. 2008 [citado 2012 Out 04];10(1):29-38. Disponível em: http://www.fen.ufg.br/revista/v10/n1/v10n1a03.htm.

8 Ministério da Saúde (BR). Portaria n. 1.459, de 24 de junho de 2011: institui no âmbito do Sistema Único de Saúde –SUS- a Rede Cegonha. Brasília (DF): MS; 2011.

9 Bittencourt RM. Análise dos fatores de risco para a mortalidade neonatal em Cuiabá-MT, 2010 [dissertação]. Cuiabá (MT): Programa de Pós-Graduação em Enfermagem, Universidade Federal de Mato Grosso; 2012.

10 Organização Panamericana de Saúde (OPAS), Rede Interagencial de Informações para Saúde. Demografia e saúde. contribuição para análise de situação e tendências. Brasília (DF): Ministério da Saúde; 2009. p.26-29.

11 Waldemar CA, Shivaprasad SG, Imtiaz FCPS, Elwyn C, Antoinette T, Garces A, et al. Newborn-care training and perinatal mortality in developing countries. N Engl J Med [Internet]. 2010 [cited 2012 May 20];362(7):614-23. Available from: http://www.nejm.org/doi/pdf/10.1056/NEJMsa0806033.

12 Rajaratnam JK, Marcus JR, Flaxman AD, Wang H, Levin-rector A, Dwyer L, et al. Neonatal, postneonatal, childhood, and under-5 mortality for 187 countries, 1970–2010: a systematic analysis of progress towards Millennium Development Goal 4. The Lancet [Internet]. 2010 [cited 2011 Jul 20];375(9730):1998-2008. Available from: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)60703-9/abstract

13 Nascimento EMR, Costa MCN, Mota ELA, Paim JS. Estudo de fatores de risco para óbitos de menores de um ano mediante compartilhamento de banco de dados. Cad Saúde Pública. 2008;24(11):2593-602.

14 Ministério da Saúde (BR). Pacto pela redução da mortalidade infantil Nordeste- Amazônia Legal. Manaus, Ago 2009 [Internet]. 2010 [citado 2011 Set 20]. Disponível em: http://portal.saude.gov.br/portal/arquivos/pdf/pacto_reducao_mortalidade_infantil.pdf.

15 Ministério da Saúde (BR), Secretaria de Atenção à Saúde, Departamento de Ações Programáticas e Estratégicas. Atenção a saúde do recém-nascido: guia prático para os profissionais de saúde. Brasília (DF): Ministério da Saúde; 2011.

16 Barría-Pailaquilén RM, Mendoza-Maldonado Y, Urrutia-Toro Y, Castro-Mora C, Santander-Manríquez G.Trends in Infant mortality rate and mortality for neonates born at less than 32 weeks and with very low birth weight. Rev Latinoam. Enferm [Internet]. 2011 [citado 2012 Ago 12];19(4):977-984. Disponível em: http://www.scielo.br/pdf/rlae/v19n4/17.pdf.

17 Lozano R, Wang H, Foreman KJ, Rajaratnam JK, Naghavi M, Marcus JR, et al. Progress towards millennium development goals 4 and 5 on maternal and child mortality: an updated systematic analysis. Lancet [Internet]. 2011 [cited 2012 Dec 20];378:1139-65. Available from:http://globalhealthcenter.umn.edu/documents/progress-mdgoals45--Lancet092411.pdf.

18 Morais CAM. Fatores de risco para a mortalidade infantil no município de Cuiabá, Mato Grosso, Brasil: linkage entre bancos de dados de nascidos vivos e óbitos infantis [dissertação]. Cuiabá (MT): Instituto de Saúde Coletiva, Universidade Federal de Mato Grosso; 2009.

19 Almeida MF, G. P. Alencar GP, Schoeps D, Novaes HMD, Campbell O, Rodrigues LC. Sobrevida e fatores de risco para mortalidade neonatal em uma coorte de nascidos vivos de muito baixo peso ao nascer, na Região Sul do Município de São Paulo, Brasil. Cad Saúde Pública [Internet]. 2011 [citado 2012 Dez 20];27(6):1088-1098. Disponível em: http://www.scielosp.org/pdf/csp/v27n6/06.pdf

20 Victora CG, Aquino EML, Leal MC, Monteiro CA, Barros FC, Szwacwald CL. Saúde de mães e crianças no Brasil: progressos e desafios. Lancet [Internet]. 2011 [citado 2012 Maio 20];(2). Disponível em: http://download.thelancet.com/flatcontentassets/pdfs/brazil/brazilpor2.pdf.

Author's address / *Endereço do autor* / *Dirección del autor*
Maria Aparecida Munhoz Gaiva
Rua General Valle, 431, ap. 1304, Bandeirantes
78010-000, Cuiabá, MG
E-mail: mamgaiva@yahoo.com.br

Received: 16.05.2013
Approved: 04.10.2013

Versão on-line em Português/Inglês: http://www.scielo.br/scielo.php?script=sci_serial&pid=1983-1447&lng=pt&nrm=iso