

RESPONSE TIME IN THE CARE OF OBSTETRIC OCCURRENCES IN A MOBILE EMERGENCY SERVICE

TIEMPO DE RESPUESTA EN LA ATENCIÓN DE EMERGENCIAS OBSTÉTRICAS EN UN SERVICIO DE ATENCIÓN MÓVIL DE URGENCIAS

TEMPO RESPOSTA NO ATENDIMENTO AS OCORRÊNCIAS OBSTÉTRICAS EM UM SERVIÇO DE ATENDIMENTO MÓVEL DE URGÊNCIA

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ABSTRACT

Objective: to analyze the response time in the management of obstetric emergencies by the Mobile Emergency Care Service of the 17th Regional Health Department of Paraná. **Methods:** This is a descriptive, cross-sectional, and quantitative study based on the analysis of 836 Paramedic Care Reports (RAS in Portuguese) between January 2019 and December 2020. Data were organized in Excel spreadsheets and statistically analyzed using simple frequencies and measures of central tendency for continuous variables. The study followed ethical guidelines under approval number 4.350.880. **Results:** Of the 13,324 cases attended during the study period, 836 (6.27%) were obstetric, including cases of hypertensive crisis, bleeding, labor, and preterm labor. Most pregnant women (99.76%) underwent prenatal care and had no comorbidities. Response time analysis revealed a predominance of transfer cases (66.3%), with greater use of the Basic Support Unit (81.6%). **Conclusion:** The study highlighted the importance of response time in the Mobile Emergency Care Service for reducing severe complications and maternal and neonatal mortality. The predominance of inter-hospital transfers underscored the need to optimize transportation and improve response efficiency. It also emphasized the importance of integrating the service with the healthcare network and ensuring continuous training of teams for obstetric emergencies, as well as the urgency of implementing strategies that guarantee efficient, humane, and high-quality pre-hospital care.

Keywords: Emergency Medical Services; Perinatal Care; Reaction Time.

RESUMEN

Objetivo: Analizar el tiempo de respuesta en la atención de urgencias obstétricas por brindada por el Servicio de Atención Médica de Urgencias (SAMU) de la 17^a Regional de Salud de Paraná. **Métodos:** Estudio descriptivo, transversal y cuantitativo, basado en el análisis de 836 Reportes de Atención del Socorrista (RAS) entre enero de 2019 y diciembre de 2020. Los datos fueron organizados en planillas Excel y analizados de forma estadística con frecuencias simples y medidas de tendencia central para variables continuas. El estudio siguió el código de ética n.º 4.350.880. **Resultados:** De los 13.224 atendimientos realizados en ese período, 836 (6,27%) fueron obstétricos, incluyendo casos de crisis hipertensiva, sangrado, trabajo de parto y parto prematuro. La mayoría de las gestantes (99,76%) realizaron el seguimiento prenatal y no presentaron comorbilidades. El tiempo de respuesta indicó predominancia de transferencias (66,3%), con la mayor utilización de la Unidad de Soporte Básico (81,6%). **Conclusión:** El estudio destacó la relevancia del tiempo de respuesta del Servicio de Atención Médica de Urgencias en la reducción de complicaciones graves, de la mortalidad materna y neonatal. La predominancia de transferencias interhospitalarias evidenció la necesidad de optimizar el transporte y la agilidad en la atención. Resaltó la importancia de la integración del Servicio con la red de Salud y de la capacitación continua de los equipos para las emergencias obstétricas, además de la urgencia de implementar estrategias que garanticen una atención prehospitalaria eficiente, humanizada y de calidad.

Palabras clave: Servicios Médicos de Urgencia; Atención Perinatal; Tiempo de Reacción.

RESUMO

Objetivo: Analisar o tempo resposta no atendimento a ocorrências obstétricas pelo Serviço de Atendimento Móvel de Urgência da 17^a Regional de Saúde do Paraná. **Métodos:** Estudo descritivo, transversal e quantitativo, baseado na análise de 836 Relatórios de Atendimento do Socorrista (RAS) entre janeiro de 2019 e dezembro de 2020. Os dados foram organizados em planilhas Excel e analisados estatisticamente com frequências simples e medidas de tendência central para variáveis contínuas. O estudo seguiu normas éticas sob parecer n.º 4.350.880. **Resultados:** Dos 13.324 atendimentos realizados no período, 836 (6,27%) foram obstétricos, incluindo casos de crise hipertensiva, sangramento, trabalho de parto e trabalho de parto prematuro. A maioria das gestantes (99,76%) realizou acompanhamento pré-natal e não apresentava comorbidades. O tempo resposta revelou predominância de transferências (66,3%), com maior utilização da Unidade de Suporte Básico (81,6%). **Conclusão:** O estudo destacou a relevância do tempo resposta do Serviço de Atendimento Móvel de Urgência na redução de complicações graves e da mortalidade materna e neonatal. A predominância de transferências inter-hospitalares evidenciou a necessidade de otimização do transporte e agilidade no atendimento. Ressaltou-se a importância da integração do Serviço com a rede de saúde e da capacitação contínua das equipes para emergências obstétricas, além da urgência em implementar estratégias que garantam atendimento pré-hospitalar eficiente, humanizado e de qualidade.

Palavras-chave: Atendimento de Emergência Pré-Hospitalar; Assistência Perinatal; Tempo de Resposta.



INTRODUCTION

Since 2010, the Unified Health System (SUS in Portuguese) has adopted the Health Care Networks (*Redes de Atenção à Saúde* in Portuguese) as an organizational model to ensure greater effectiveness in health care in Brazil. These networks are structured as a polycentric system composed of different points of care, interconnected through coordination mechanisms that promote the continuity and comprehensiveness of care. This approach aims not only to improve the population's health indicators but also to ensure more comprehensive and effective care⁽¹⁾.

Among the priorities of this policy, thematic networks that address specific areas of care are highlighted, such as the Stork Network (*Rede Cegonha* in Portuguese), the Urgency and Emergency Care Network, the Psychosocial Care Network, the Care Network for People with Disabilities (RCPD in Portuguese), and the Chronic Disease Care Network. Each of these networks contributes to transforming the model of care by promoting more integrated actions focused on the needs of SUS users⁽¹⁾.

The Urgency and Emergency Care Network was created with the purpose of articulating and integrating various health services, aiming to expand and improve access for users in situations of urgency and emergency in a rapid and efficient way. The components that take part in this network include actions of health promotion, prevention, and surveillance;

primary care; the Mobile Emergency Care Service (SAMU in Portuguese); stabilization rooms; the National Health Force; Emergency Care Units (UPAs in Portuguese); hospitals; and home care⁽¹⁾.

The Mobile Emergency Care Service is the mobile component of the national urgency and emergency policy. Its operation is coordinated by the Emergency Regulation Centers, which play a strategic role as observatories of the health system. These centers are staffed by professionals trained to manage service requests, performing triage and classification of calls based on the severity and priority of each situation. This process allows organizing care flows in an efficient way, ensuring an appropriate and prompt response to emergency demands⁽²⁾.

In the context of obstetric demands, during pregnancy, women experience specific health conditions resulting from the gestational state itself. However, in some circumstances, clinical or obstetric complications may arise, posing risks to maternal and/or fetal health. In such situations, it is essential that the pregnant woman be responsibly and promptly referred to specialized reference services. This referral must ensure effective integration among the different levels of health care, ensuring that access and transit between services occur in a coordinated and facilitated way⁽³⁾.

Thus, the work of the Mobile Emergency Care Service becomes fundamental for providing care and rapid transport for these patients. In

other words, it serves as an important tool to reduce the number of deaths due to delayed access to care, as well as to minimize complications⁽⁴⁾.

There is a global consensus on the importance of reducing maternal and infant mortality rates, once they serve as indicators regarding the quality of health services provided to women and children. Both the United Nations and the World Health Organization have made worldwide efforts to reduce these rates, establishing global targets such as the Millennium Development Goals (MDGs), between 1990 and 2015, and currently, the Sustainable Development Goals (SDGs), which aim to reduce preventable deaths by 2030⁽⁵⁾.

The COVID-19 pandemic significantly impacted prenatal care, compromising comprehensive care for both mother and baby. The health crisis hindered the achievement of the Sustainable Development Goals established by the United Nations, such as reducing maternal mortality to fewer than 70 deaths per 100,000 live births by 2030. The increase in maternal mortality was attributed both to infections caused by the virus and to difficulties in accessing prenatal care, as well as a reduction in births conducted by qualified professionals. This situation highlighted the fragility of the health system in the face of global emergencies, while it underscored the vulnerability of health services during sanitary crises, emphasizing the need to strengthen care during critical periods⁽⁶⁾.

In 2020, Brazil recorded 71.97 maternal deaths per 100,000 live births. In the following

year, 2021, this went up to 107.53 per 100,000, representing a 77% increase compared to the previous period. Since 2022, the rates have declined, returning to levels to the pre-pandemic period ones, registering 50.65 deaths per 100,000 live births in 2022, and 49.08 in 2023. Despite this decrease, the situation remains concerning, as the country remains far from the goals established by the SDGs⁽⁷⁾.

METHODS

This is a descriptive⁽⁸⁾, cross-sectional study with a quantitative approach. The study was conducted at the Mobile Emergency Care Service (192) of the Regulatory Complex, linked to a Health Regional Office in the State of Paraná. The service was regulated by Ordinance No. 2,137/GM/MS on October 7, 2004. In 2012, Ordinance No. 1,010 implemented the regionalization of the Center, transforming it into the Urgency Regulatory Complex. This complex covers the care of 21 cities in the region, serving approximately 970,000 inhabitants.

For the organization of care, SAMU was divided into two service hubs, named A and B. Hub A encompassed seven cities, serving 696,030 people, and had three advanced life support units (ALS), one rotor-wing air medical unit, and six basic life support units (BLS). Hub B, on the other hand, covered 14 cities, serving 273,970 people, and included one advanced life support unit and five basic life support units⁽¹⁰⁾.

The subject of this study consisted of the Paramedic Care Reports related to obstetric care conducted from January 1, 2019, to

December 31, 2020. In total, 13,324 reports were analyzed, of which 836 (6.27%) were of an obstetric nature, constituting the sample of this research.

For data collection, a database was created using Microsoft Excel for Windows®. This database was later divided into two parts: 1) information regarding the characterization of obstetric occurrences and personal data, including age and the presence of comorbidities; and 2) care details, encompassing the origin and nature of the service, the reason for the request, the type of resource used, as well as the response time indicator, which was categorized according to the SAMU service stages, as described below.:

- Time 01 (**T1**): Time between 192 call and ambulance dispatch;
- Time 02 (**T2**): Time between ambulance dispatch and departure;
- Time 03 (**T3**): Time between departure and arrival at the scene;
- Time 04 (**T4**): Time spent providing care at the scene;
- Time 05 (**T5**): Time from leaving the scene and arriving at the destination.

The data were inserted into Excel 365® version 2019 spreadsheets, where they were coded and categorized for subsequent descriptive statistical analysis. Simple frequency descriptive analyses were used for nominal or categorical variables. Mean or median values were used for continuous variables depending on the data distribution.

The study was conducted in accordance with national and international research ethics standards, under approval number 4,350,880.

RESULTS

In this study, 836 Paramedic Care Reports related to obstetric care were investigated, representing 6.27% of the total 13,324 calls attended by the Mobile Emergency Care Service during the study period. Table 1 shows these occurrences profile according to age group, comorbidities, origin of the call, nature of the occurrence, and type of resource used.

Table 1 – Profile of obstetric occurrences attended by the Mobile Emergency Care Service, according to age group, comorbidities, origin of the call, nature of the occurrence, and type of resource used. Londrina, 2024. (n=836)

Variables	Total (n)	Total (%)
Age		
11 to 17	78	9.3
18 to 35	651	77.9
Above 35	84	10
Not filled in the report	23	2.8
Comorbidities		
No	590	70.6
Yes	237	28.3
Not filled in the report	9	1.1
Origin of the call		
Psychosocial Care Center II	1	0.1
Specialties Center	1	0.1
Police Station	1	0.1
High-Complexity General Hospital	1	0.1
Medium-Complexity General Hospital	466	55.7
Municipal Maternity Hospital	7	0.8
Residence	275	32.9
Primary Health Care Unit	47	5.6
Emergency Care Unit	30	3.6
Public Streets	2	0.2
Not filled in the report	5	0.6
Nature of Occurrence		
Emergency Care	281	33.6
Transfer	554	66.3
Not filled in the report	1	0.1
Resources		
BLS	682	81.6
ALS	154	18.4

Source: the author, 2024.

A total of 86 reasons for obstetric care requests were identified in the service analyzed.

Among them, hypertensive crisis/spike, bleeding, labor, and preterm labor were the most

frequent. It should be noted that 160 women presented more than one reason for requesting

emergency care or transfer as Table 2 evidences.

Table 2 – Reasons for service requests for obstetric occurrences. Paraná, Brazil, 2024.

Reason	Total (n)	Total (%)
Abortion	13	1.55
Assault	3	0.35
Seizure	8	0.95
Hypertensive crisis/spike	166	19.87
Decreased fetal movement	5	0.59
Lower back pain	27	3.22
Emesis	12	1.43
High-risk pregnancy	24	2.87
Ectopic pregnancy	15	3.22
Twin pregnancy	14	1.67
Hypotension	9	1.07
Bleeding	82	9.80
Labor (ruptured membranes, fluid loss, contractions, and loss of mucus plug)	451	53.94
Preterm labor	56	6.69
Drug and alcohol use	6	0.71
Other	135	16.14

Source: the author, 2024.

As stated in Table 3 below, the analysis of response time indicators, by type of occurrence and resource, showed that the mean time between the call to the Mobile Emergency Care Service and ambulance dispatch was higher for transfer cases (64 minutes) and basic life support units (46 minutes). The mean time between departure and arrival at the scene was higher for emergency care cases (10 minutes) and advanced life support units (13 minutes). The mean time between departure and arrival at the scene was 32 minutes for transfer cases and 57 minutes for advanced life support units. Regarding the time from leaving the scene to arrival at the destination, the mean was higher

for transfer cases (41 minutes) and advanced life support units (57 minutes).

Table 3 – Response time indicators of care provided by the Service, by type of occurrence and resource.
Paraná, Brazil, 2024. (n=827)

	Occurrence		Resource	
	Emergency Care	Transfer	ALS	BLS
T1				
Mean	27	64	46	53
Standard Deviation	0.039	0.065	0.046	0.062
Median	14	33	21	24
Range	0 – 819	0 – 1297	0 – 437	0 – 1297
T2				
Mean	10	06	13	6
Standard Deviation	0.064	0.026	0.040	0.043
Median	01	00	3	0
Range	0 – 1431	0 – 606	0 – 606	0 – 1431
T3				
Mean	19	25	45	18
Standard Deviation	0.059	0.079	0.101	0.064
Median	12	11	21	11
Range	0 – 1401	0 – 1430	0 – 1430	0 – 1391
T4				
Mean	10	32	19	26
Standard Deviation	0.009	0.085	0.011	0.078
Median	07	16	18	12
Range	0 – 130	0 – 1435	0 – 116	0 – 1435
T5				
Mean	31	41	57	34
Standard Deviation	0.090	0.063	0.089	0.071
Median	09	30	31	23
Range	0 – 1242	0 – 910	0 – 910	0 – 1242

T1 - Time between the 192 call and ambulance dispatch; **T2** - Time between ambulance dispatch and departure; **T3** - Time between departure and arrival at the scene; **T4** - Time spent providing care at the scene; **T5** - Time from leaving the scene to arrival at the destination.

Source: the author.

DISCUSSION

The analysis of the results evidenced a predominance of care provided through transfers, with a mean time of 64 minutes, particularly involving basic life support units, which had a mean time of 46 minutes. This suggests that

most cases involved inter-hospital transfers, that is, from facilities with lower levels of support, such as secondary hospitals, to medium- or high-complexity hospitals.

In situations classified as urgent or emergency, time, along with the type of service provided, plays a crucial role in patient care. The



activation of the Mobile Emergency Care Service contributes significantly to improving patient prognosis by enabling rapid and effective access to a reference service. This pre-hospital care proves to be an essential tool for reducing mortality associated with delayed access to health care and for minimizing the risk of complications that could arise from late intervention⁽⁴⁾.

In Brazil, the main public pre-hospital emergency service is the Mobile Emergency Care Service, regulated by the Ministry of Health through Ordinance No. 2048/GM, from November 5, 2002. In urgent situations, this ordinance establishes safe transport and specialized care for individuals experiencing health complications, including clinical and obstetric emergencies⁽³⁾.

The occurrence of health complications related to pregnancy requires early risk identification. It implies the need for specialized care, including examinations, assessments, and additional monitoring. To ensure equity and adequate access to care in urgent situations, it becomes essential that pre-hospital services adopt triage based on severity criteria⁽³⁾.

A study conducted by Cyrino⁽²⁾ highlights that, in recent years, there has been a significant increase in pre-hospital care requests that do not qualify as urgent or pertinent cases. This categorization can impose challenges both for service management and for the patients themselves, directly impacting the quality of care provided. It may lead to dissatisfaction among health professionals and result in significant

consequences, such as longer waiting times for patients, increased mortality rates, and higher costs for the health system⁽²⁾.

Additionally, a significant number of relevant details for obstetric care are not properly recorded in patients' medical records. However, it is important to highlight the role of the knowledge that pregnant women acquire throughout gestation, particularly through prenatal consultations. A study conducted by Freitas⁽³⁾ reports that 58% of pregnant women stated they had not received adequate guidance regarding risk signs and labor during this follow-up⁽³⁾.

This informational gap underscores the need to implement health education strategies across different contexts and institutions. These strategies should provide opportunities for exchanging experiences, consolidating knowledge, and clarifying doubts⁽³⁾.

Prenatal care conducted by nurses plays a fundamental role in promoting a healthy pregnancy and proper fetal development, by enabling the prevention and early detection of potential pathological complications. Through a comprehensive and systematic approach, nurses provide attentive care and qualified follow-up, establishing a trusting relationship with the pregnant woman⁽¹¹⁾.

This relationship is essential for ensuring humanized care, promoting not only the woman's physical health but also her emotional well-being throughout the gestational period. During prenatal care, nurses conduct regular consultations, perform procedures and

examinations, and carry out educational activities aimed at informing the pregnant woman about the necessary care during this period, such as recognizing risk signs, breastfeeding, and maintaining healthy habits. These actions directly contribute to the promotion and quality of maternal and fetal health, reinforcing the nurse's role as a key agent in primary health care⁽¹¹⁾.

In this study, the most recurrent comorbidities were hypertensive crisis/spike, vaginal bleeding, labor, and preterm labor.

Arterial Hypertension and Hypertensive Disorders of Pregnancy are prevalent conditions, affecting approximately 10% of pregnant women and representing one of the leading causes of maternal mortality worldwide. The diagnosis of these disorders is established when systolic blood pressure is ≥ 140 mmHg and/or diastolic blood pressure is ≥ 90 mmHg, measured twice at intervals of 4 hours⁽¹²⁾.

These disorders include five categories: chronic hypertension (prior pregnancy), gestational hypertension (onset after the 20th week), preeclampsia (hypertension with proteinuria ≥ 300 mg/24h), eclampsia (seizures associated with preeclampsia), and preeclampsia superimposed on chronic hypertension (exacerbation of pre-existing hypertension with signs such as proteinuria or hepatic dysfunction/thrombocytopenia after the 20th week)⁽¹²⁾.

Vaginal bleeding during pregnancy can be caused by several conditions, such as miscarriage, ectopic pregnancy, cervical or

vaginal lesions, uterine infection, and trophoblastic disease. In the first trimester, it affects between 20% and 40% of pregnant women, while after the 20th week it occurs in about 4% to 5% of pregnancies. Among the most common causes in the second and third trimesters are placenta previa (20% of cases) and placental abruption (30%). Rarer causes include uterine rupture and vasa previa, although in many cases the etiology remains undefined⁽¹³⁾.

Labor is a natural process divided into three stages: the first, the second, and the third. The first stage begins with regular and strong contractions, which may occur spontaneously or be induced, and is subdivided into the latent phase (0 to 6 cm of dilation) and the active phase (from 6 cm to full dilation of 10 cm). The second stage starts with full dilation and ends with the birth of the newborn, being influenced by factors such as fetal position and the intensity of expulsive efforts. The third stage begins with the birth of the newborn and ends with the expulsion of the placenta⁽¹⁴⁾.

Preterm labor is one of the main pregnancy complications, associated with high rates of neonatal morbidity and mortality. It is characterized by the spontaneous onset of labor between the 22nd and 36th weeks of gestation, with regular uterine contractions that cause cervical effacement (80% or more) and dilation of at least 1 cm, indicating the progression of labor before the ideal time, posing risks for both mother and fetus. Risk factors for preterm labor include maternal age, smoking, parity, and

pregnancy complications such as urinary tract infections⁽¹⁵⁾.

Finally, it is worth noting that the limitations of this study are related to the difficulty in data collection due to the incomplete recording of some variables, as well as the lack of standardization of information. However, the results may serve as a valuable tool for managers and healthcare professionals in attending obstetric emergencies, especially in cases of inter-hospital transfers and in the use of basic life support units, which showed longer ambulance activation times. Ultimately, these findings highlight the need to optimize response times during transfers and to ensure adequate infrastructure to meet obstetric demands, thereby reducing risks and complications.

CONCLUSION

The response time of the Mobile Emergency Care Service (SAMU) is a critical factor in ensuring the effectiveness of emergency assistance, particularly in obstetric cases, which often involve high risk for both the mother and the fetus. This study demonstrates that most of the services provided by SAMU consisted of inter-hospital transfers, with an average time of 64 minutes, while calls handled by the basic life support units had an average of 46 minutes. These intervals highlight the need for continuous optimization of triage and dispatch processes, considering that time represents a key determinant for positive outcomes in emergency situations.

In the obstetric context, conditions such as hypertensive disorders of pregnancy, preterm labor, vaginal bleeding, and other severe complications require a rapid and well-structured response. Delays in care may significantly increase the risks of maternal and perinatal morbidity and mortality. Despite the challenges faced, SAMU remains an indispensable resource, providing vital support in critical moments and ensuring the safe transport of patients to higher-complexity healthcare facilities.

To improve response time indicators, it becomes essential investing in strategies that include staff training, the adoption of technologies to optimize routes, the reduction of unnecessary calls, and the strengthening of integration across healthcare services. In the field of obstetric emergencies, such measures can help minimize complications and save lives, reinforcing the role of the Mobile Emergency Care Service as a prime component of pre-hospital care.

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Authorship Criteria (Author Contributions)

Lima, G. C. O. de. contributed substantially to the study design; data analysis and interpretation; drafting, critical review, and final approval of the published version.

Ludwig, E. F. S. B. contributed substantially to the study design and planning; data collection, analysis, and interpretation; drafting, critical review, and final approval of the published version.

Melo, E. C. contributed substantially to the study design; drafting, critical review, and final approval of the published version.

Haddad, M. C. F. L. contributed substantially to the study design; data analysis and interpretation;



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Declaration of Conflict of Interest

Nothing to declare.

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