



Characterization of emergency pre-hospital mobile service: follow up 14 years (2005-2018)

Caracterização de atendimentos do serviço pré-hospitalar móvel de urgência: follow up 14 anos (2005-2018)

Simone Sampaio da Costa¹, Vinicius Gonçalves Boaventura², Anselmo Cordeiro de Souza³, Elias Ferreira Porto^{3,4}

¹ Lutheran University Center of Palmas (CEULP/ULBRA), Palmas TO Brazil.

² Intra-hospital Commission for the Donation of Organs and Tissues for Transplants of the Hospital Geral de Palmas TO Brazil.

³ Centro Universitário Adventista de São Paulo (UNASP), São Paulo SP Brazil.

⁴ Master's Program in Health Promotion UNASP, São Paulo SP Brazil.

*Corresponding author: Elias Ferreira Porto - E-mail: eliasporto@gmail.com

ABSTRACT

Knowing the profile of the assistance provided to a given population can assist in the definition of public health policies for the territory. This study aims to characterize the profile of calls made by the mobile emergency service in the city of Palmas, state of Tocantins, Brazil. It is about a retrospective, descriptive and quantitative research of the occurrences attended by the emergency mobile service of this city between 2005 and 2018. In the surveyed period there were 222,278 regulated attendances, 141,944 occurrences, 30,566 occurrences of hazing and 47,757 orientations (telemedicine). There were 124,575 occurrences with the sending of mobile units, of which 12,746 (10%) served by advanced service units, and 77,750 (62%) served by basic service units. Regarding the nature 72,080 (44.3%) occurrences did not report, 53,795 (33.1%) were records of a clinical nature, 22,710 (13.9%) visits due to external (traumatic) causes, 8,787 (5.4%) cases gynecological-obstetric and 5,119 (3.1%) psychiatric. It is concluded that the attendance profile is of a clinical nature, with an increasing number of regulated attendances and a high number of prank calls.

Keywords: Emergencies. Emergency medical services. Prehospital Care. Telemedicine.

RESUMO

Conhecer o perfil da assistência prestada a determinada população pode auxiliar na definição de políticas públicas de saúde para o território. Este estudo tem o objetivo de caracterizar o perfil de atendimentos realizados pelo serviço de atendimento móvel de urgência no município de Palmas, Estado de Tocantins, Brasil. Trata-se de uma pesquisa retrospectiva, descritiva e quantitativa das ocorrências atendidas pelo serviço móvel de urgência da cidade entre 2005 e 2018. No período analisado, foram 222.278 atendimentos regulados, 141.944 ocorrências, 30.566 trotes e 47.757 orientações (telemedicina). Houve 124.575 ocorrências com envio de unidades móveis, das quais 12.746 (10%) atendidas por unidades de serviços avançados e 77.750 (62%) por unidades de serviços básicos. Quanto à natureza, 72.080 (44,3%) ocorrências não continham tal informação, 53.795 (33,1%) foram registros de natureza clínica, 22.710 (13,9%) atendimentos por causas externas (traumáticas), 8.787 (5,4%) casos ginecológico-obstétricos e 5.119 (3,1%) psiquiátricos. Conclui-se que o perfil dos atendimentos é de natureza clínica, com crescente número de atendimentos regulados e com alto número de trotes.

Palavras-chave: Assistência Emergências. Pré-Hospitalar. Serviços médicos de emergência. Telemedicina.

Received in October 13, 2020
Accepted on December 04, 2020

INTRODUCTION

Worldwide, accidents annually kill about 4.8 million individuals and leave more than 970 thousand injured; the main causes of death are land traffic accidents (TA), suicides, falls and homicides¹⁻³. Among people who suffered injuries, 5.8% (56.2 million) needed to be hospitalized and 38.5% (21.7 million) had fractures¹. It is noteworthy that 23% of the total global disease burden is attributable to disorders in those aged 60 or over; in this case, the main contributors are cardiovascular diseases (30.3% of the total load), malignant neoplasms (15.1%), chronic respiratory diseases (9.5%), musculoskeletal diseases (7.5%) and neurological and mental disorders (6.6%)⁴.

In view of this scenario, it is considered an important consensus in public health that pre-hospital care (PHC) in urgencies and emergencies can reduce suffering, increase the chances of survival and reduce disabling physical and emotional sequelae⁵. The PHC is defined as any assistance performed, directly or indirectly, outside the hospital environment. It may consist of sending the ambulance to the scene of the incident or providing medical advice by telephone; in addition, its objective is to reduce the interval of care for victims of emergencies between the place of occurrence and the hospital units^{6,7}.

The PHC is distinguished due to the fact that it is a different service category from the others in the health area, as it involves assistance in various types of trauma in external hospital environments. It is divided into two types of services, fixed and mobile. The first is carried out by the Basic Health Units (UBS), Family Health Units, teams of community health agents, specialized outpatient clinics, Diagnostic and Therapies Services and also non-Hospital Emergency Care Units. The mobile service is characterized by the Mobile Emergency Service (Samu) and associated rescue services, as is the case of the Fire Department⁸⁻¹¹.

In the military Fire Department, the professionals have technical training in health care,

and assistance with “basic life support” is provided. In contrast, the Samu team consists of doctors, nurses and nursing technicians, who work in both basic and advanced support; the service is prevalent in the composition of the National Emergency Care Policy (PNAU)¹²⁻¹³.

In the capital city Palmas, State of Tocantins, Brazil, the regional Samu-192, under municipal management, has, by means of a tripartite agreement¹², established the cities that comprise the territory covered by the Emergency Medical Regulation Center of Samu. In addition to serving the capital, it provides assistance to other nearby municipalities, such as Paraíso do Tocantins, Porto Nacional, Lajeado, Miracema do Tocantins, Miranorte do Tocantins, Novo Acordo and Tocantínia. The Medical Regulation Center is located in Palmas, containing four Basic Support Units (USB) and an Advanced Support Unit (USA); Porto Nacional, Paraíso do Tocantins, Novo Acordo and Lajeado each have a USB team, and Lajeado also serves the cities of Miracema do Tocantins, Miranorte and Tocantínia¹⁵.

It is emphasized that there are several reports that the actions developed by the local Samu have immediate little-known results, with the suggestion of creating a database for the elaboration of a descriptive baseline of the epidemiological profile^{7,16-17}. Although there are data integration initiatives between several capitals in the national scenario, as is the case of the Projeto Vida no Trânsito project, which had the collaboration of Samu of Palmas, the effort undertaken covers only part of the profile of injuries served by this Service¹⁸.

Knowing the epidemiology of acute illnesses that affect a certain population is essential to define their prevention policies, as well as the deaths they cause⁷. This context reinforces the importance of developing studies on the reality of the territory, when seeking subsidies for an evidence-based practice. Thus, the objective of this research is to describe the profile of care provided by Samu in the municipality of Palmas, State of Tocantins, Brazil, from 2005 to 2018.

METHODS

This is a retrospective, descriptive and analytical research with a quantitative approach to the occurrences attended by the mobile emergency service in Palmas, State of Tocantins, Brazil. Samu-192 regional supervision of the city was asked to provide the available data relating to assistance delivered between 2005 and 2018. The information was collected from May to June 2019.

Palmas is strategically located in the center of the state, on the right bank of Tocantins River, and completed 29 years in 2019. It is surrounded by the mountains of Carmo and Lajeado. These topographic features lead the city, unlike others, to the situation of only being able to develop to the south¹⁹. According to data from the Municipal Health Secretariat²⁰, it is located in the northern region of Brazil, with 2,219 km² of territorial extension, and an average altitude of 330 meters above sea level.

Data collection took place after authorization from the institution where the research was carried out and approval from the Ethics Committee of the institution proposing the study, under No. 3,346,131. Descriptive statistics of the data were carried out,

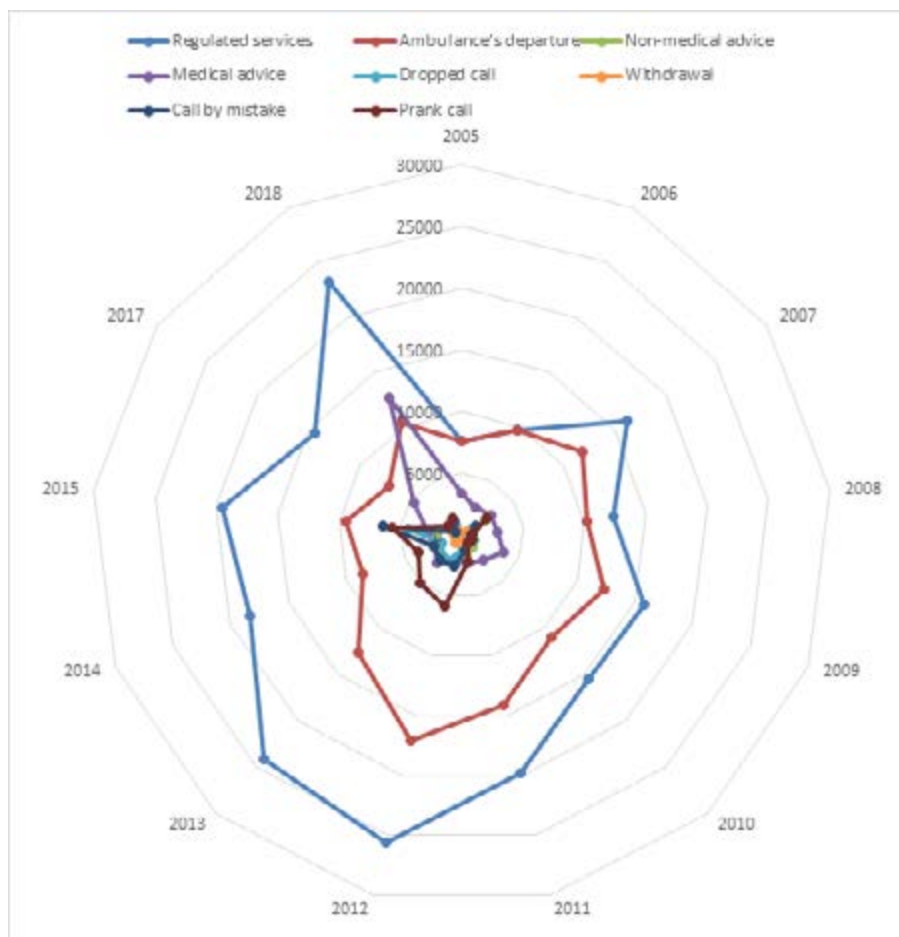
almost entirely categorical, by means of relative and absolute frequency.

RESULTS

The data indicated refer to the time frame from 2005 to 2018; however, those concerning 2016 and the last trimester of 2017 (October to December) are not included in this section, because not all of them were available at the time of this survey.

During this period, 222,278 regular services and 141,944 occurrences were assisted with ambulances from the Samu unit in Palmas. It is noteworthy that there were 30,566 prank calls, 47,757 services with medical guidance, and 16,392 with non-medical guidance.

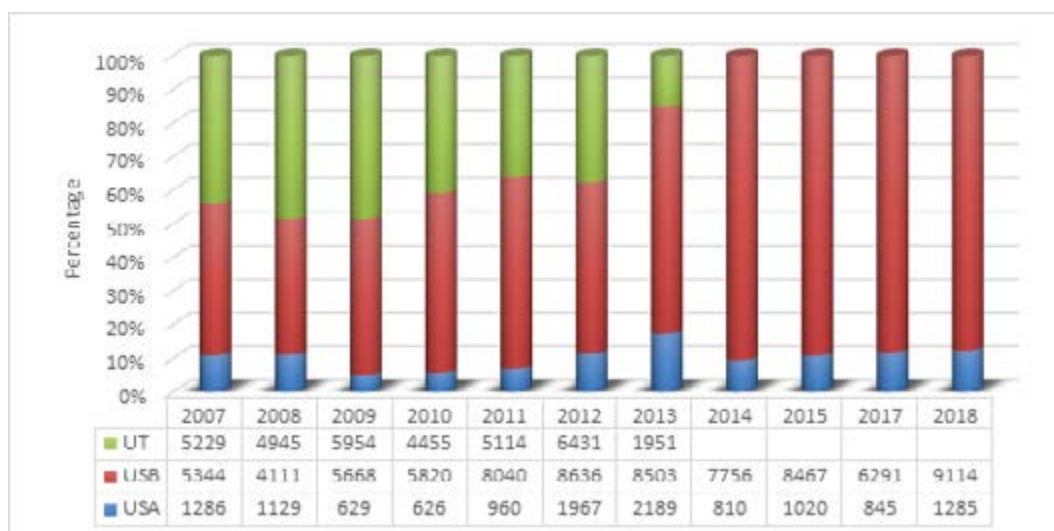
Concerning the temporal aspect analyzed year by year, there was an increasing number of occurrences from 2005, with a considerable peak of calls in 2012. As for prank calls, from 2007 a successive drop occurred until 2010, and in 2011 they returned increasing, with a peak in 2012 that remained on the rise until 2018. Graph 1 illustrates this scenario.



Graph 1. Characterization of telephone calls answered by Samu originating in the city of Palmas, State of Tocantins, Brazil, 2005-2018. Source: research data

Regarding calls answered with vehicle sending, between 2007 and 2018, 124,575 calls were made, of which 12,746 (10%) records served by the USA, 77,750 (62%) occurrences served by USB and

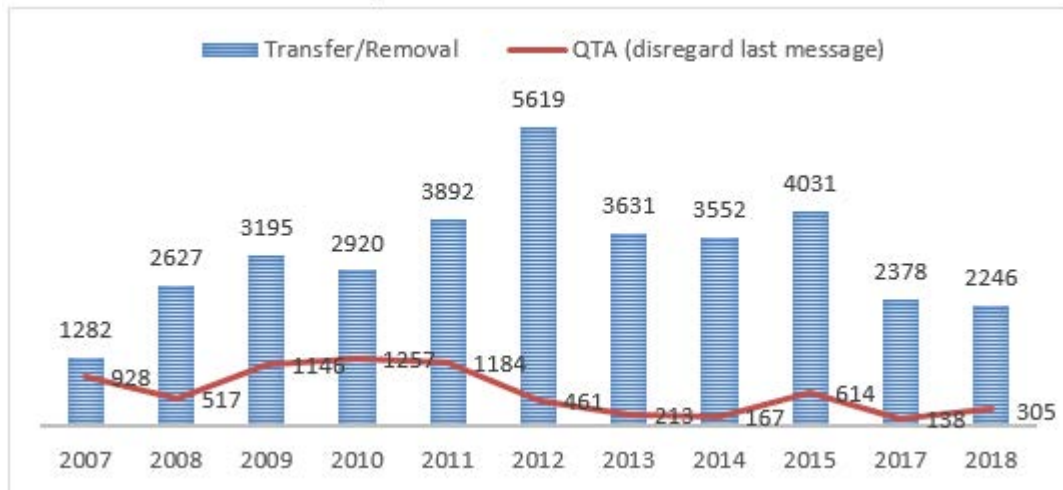
34,079 (27%) calls made by the abolished Transport Unit (UT). The largest number of sending USA was in 2013, followed by 2012. In relation to USB, the largest number was in 2018, as explained in Graph 2.



Graph 2. Occurrences according to type of ambulance sent by Samu originating in the city of Palmas, Tocantins, Brazil, 2007-2018. Source: research data.

Regarding the type of service provided, there were 35,373 removals/transfers and 6,930 occurrences of transport/QTA (disregard last message) between

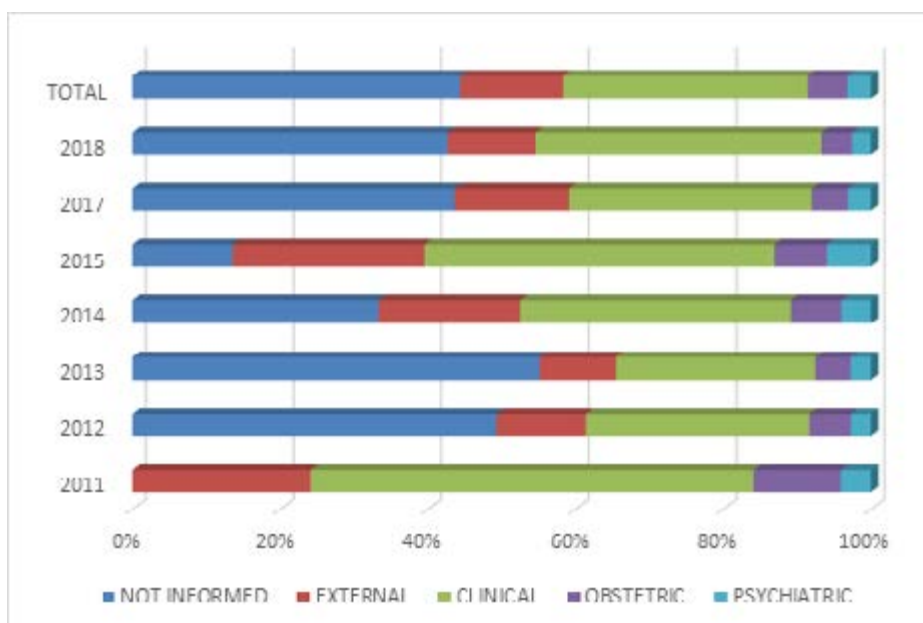
2007 and 2018. As for transport/QTA performed, there was an irregularity of records, with a greater number of services in 2011, as shown in Graph 3.



Graph 3. Occurrences according to type of service provided Samu originated in the city of Palmas, Tocantins, Brazil, 2007-2018. Source: research data.

The data available for the nature of care provided by USB and USA ambulances from 2011 to 2018 total 162,491 records; of these, 72,080 (44.3%) were not informed, 53,795 (33.1%) are records of a clinical nature, 22,710 (13.9%) assistance due to external (traumatic) causes and 8,787 (5.4%) and

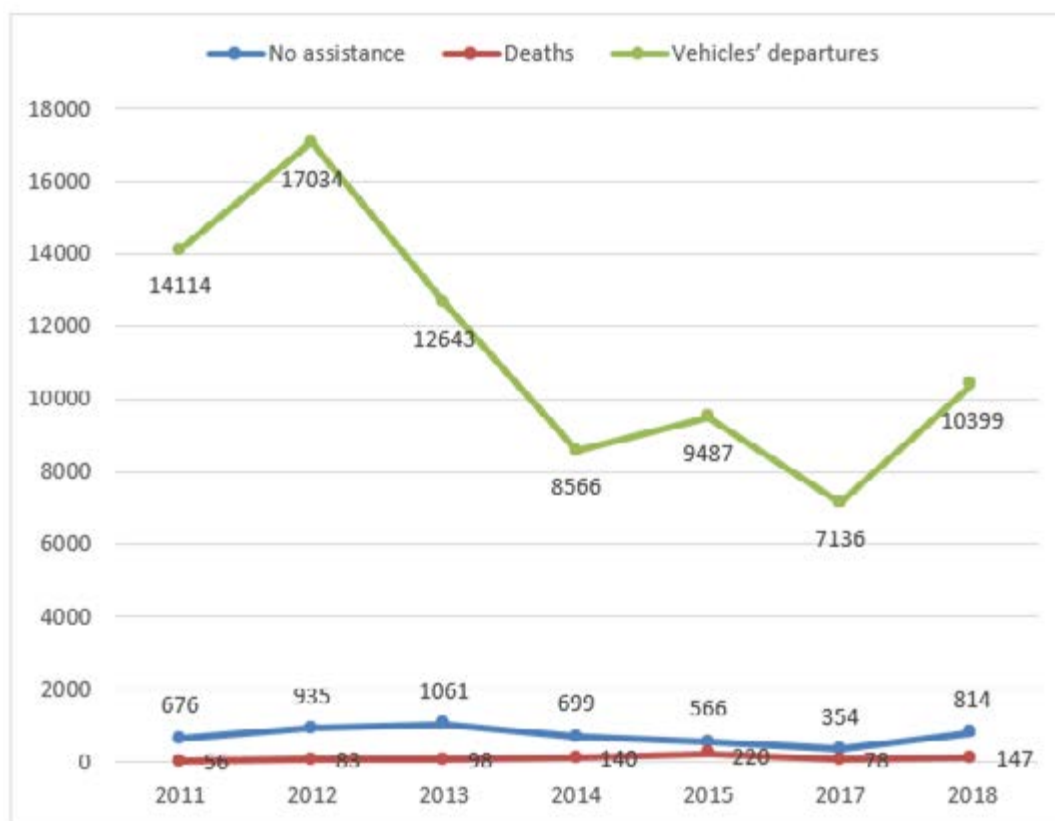
5,119 (3.1%) gynecological-obstetric and psychiatric cases, respectively. With some exceptions, in general, the absolute numbers of clinical and external causes have been decreasing year after year since 2013; the number of calls increased again in 2018 compared to 2017, according to what is shown in Graph 4.



Graph 4. Assistance according to nature of occurrence provided by Samu originating in the city of Palmas, Tocantins, Brazil, 2011-2018. Source: research data.

The number of occurrence records with ambulance's movement without assistance at the site (refusal, evaded, removed by others) from 2011 to 2018 totaled 4,429 cases, with 766 deaths verified on arrival, during transport or during assistance to the victim. With regard to the time frame, there was an increase in records of non-attendances from 2011 to

2013 and a decrease in occurrences between 2013 and 2017, with a new increase in 2018. The notification of deaths experienced continuous growth since 2011, with a peak of cases in 2015 (220 deaths), with a slight decrease in 2016 (78 deaths) and a further rise in 2018 (147 deaths). The data are illustrated in Graph 5.



Graph 5. Vehicles' departures, occurrences in which there was no care and deaths registered by Samu originating in the city of Palmas, Tocantins, Brazil, 2011-2018.

Source: research data.

DISCUSSION

The main aim of this investigation was to describe the profile of care provided by Samu from the city of Palmas, Tocantins, Brazil, from 2005 to 2018. The calls (regulated care, medical and non-medical advice) were characterized in absolute numbers, dropped calls, withdrawal, prank calls and by mistake), type of vehicle sent (USB and UBS), nature of care (transfer, clinical, traumatic, obstetric and psychiatric) and number of deaths reported.

This study generates an overview of how the distribution of occurrences attended by this service has been performing year by year. In this sense, Dias et al.²¹ reinforces the findings of this research about the need for periodic studies of the epidemiological and health profile related to the care provided by Samu, which can be seen as an observatory for the whole Health Care Network.

In this study, there was a tendency for growth in practically the entire surveyed period in relation to

the absolute number of regulated services; this may be related to the growing coverage and adherence of the population due to the consolidation of Samu reflected over the years²². However, there are reports in Brazil, as well as in countries such as the United States and England, that sometimes citizens use this service improperly, as a way to access the health system. Such conduct brings an unnecessary burden, in addition to increasing the response time in cases in which emergency care is truly essential, decreasing the chances of mitigating the sequelae and even maintaining the lives of injured victims^{21,23}.

In this work, another potential factor preventing the practice of shorter response time by Samu was evidenced, the high number of prank calls: there were 30,566 cases, with median and annual average of 2,184 and 2,788 \pm 1,891 occurrences, respectively. As Peixoto, Sousa and Odon²⁴ point out, there is an impropriety in the treatment of prank calls in the criminal sphere, since the Penal Code offers limited possibilities of punishment. The authors refer to article 340 of this legal provision, according to which it is possible to punish those who “provoke the action of authority by informing them of the occurrence of a crime or misdemeanor that they know has not occurred”; however, the law does not cover the false communication of emergency situations, which generate action of Samu.

According to Law No. 12,737, issued on November 30, 2012, which is about the criminal classification of computer-related crimes and also changes Article 266 of Decree-Law No. 2,848, of December 7, 1940 - Penal Code, which deals with the interruption or disturbance of telegraphic, telephone, computer, telematic or information services of public utility, for those who commit such an offense the penalty is one to three years of imprisonment and a fine²⁵. However, its value is not determined.

For Manoel and Arduin²⁶, “a rule without a declared sanction is unlikely to be fulfilled”. Thus, some Brazilian states, such as São Paulo, Santa Catarina, Paraná and Rio Grande do Sul, have enacted

laws that provide for fines for those who are caught hoaxing agencies with emergency telephone numbers, without prejudice to the criminal sanctions in force in the country²⁷.

The Penal Contravention Law encourages the application of criminal sanctions to the person who commits the act of hoax aiming to disturb the tranquility/work of the server receiving the call, and that the latter must make a police report reporting the fact and presenting oneself as a victim of the action²⁷. Most of the time, this is not feasible for Samu’s professionals.

It is emphasized that from 2011 to 2018 the nature of the occurrence was not informed in 44.3% of the services provided, which may show an operational gap in its correct record. This is similar to the research carried out by Almeida et al.²⁸, which presents a high percentage of records without information from the service sector.

In this study, there was a prevalence of clinical events, followed by calls for external causes. A high frequency of clinical assistance has also been reported in other studies^{7,28-29}, a fact that shows that the profile of Samu’s provided services was more focused on complications of some chronic conditions.

For Dias et al.²¹ (2016), the expressive number of clinical assistance can denote social factors, such as difficulties and obstacles in the use of the health care network related to the vulnerability of citizens who need care repeatedly, making Samu the gateway to the health system. This research also infers that the increase in the number of individuals with chronic non-communicable diseases, as well as the number of elderly people, may be related to this clinical profile of the assistance provided by this service.

Among the limitations of this study, it is noteworthy that it was not possible to outline the complete profile of calls in the proposed time frame. This was because the data was no longer accessible, due to a technical accident in the Samu Palmas region, making it impossible even to cross the information in the reports accessed, with a digital record. Another

important limitation is in relation to the missing data regarding the nature of services, in a proportion that can mask the reality regarding the profile of the prevalent injuries.

Among the strengths, it is worth mentioning the fact that the information in the present investigation is scarce in the territory, so they can assist in directing strategies in partnership with Primary Health Care, as well as potentialize the reduction of the main causes for triggering the occurrences or even guide Samu's best and most effective operating practices.

The interdisciplinary and interprofessional effort has been proposed on themes analogous to trauma, to overcome the exaggerated challenges set in the surrounding reality in the territory, as a means of promoting individual and collective health in an intersectoral confluence^{2-3,17}. It is inferred that the extrapolation of the referred approach to epidemiological assistance and surveillance in the practice of Samu can generate potential gains in the effectiveness of its actions. Thus, programs are desirable to implement best practices for professionals in this service with regard to the notification of the assistance provided, as well as the incorporation of digital systems that include a more complete picture of important sociodemographic and epidemiological variables, which do not yet exist for quick verification.

CONCLUSION

It is characterized by a prevalent profile of care provided by basic support units, of a clinical nature, with an increasing number of regulated occurrences and with a high amount of prank calls from 2005 to 2018. Such panorama reflects, as an observatory, the most frequent clinical-epidemiological cases assisted at Samu.

It is urgent that this data be considered in the formulation of institutional and social management policies for the sustainable development of the territory, as well as to guide better practices to avoid and mitigate recurrent injuries, in a confluence of intersectoral efforts.

REFERENCES

1. Malta DC, Minayo MCDS, Soares AM Filho, Silva MMAD, Montenegro MDMS, Ladeira RM, et al. Mortality and years of life lost by interpersonal violence and self-harm: in Brazil and Brazilian states: analysis of the estimates of the Global Burden of Disease Study, 1990 and 2015. *Rev Bras Epidemiol.* 2017; 20(Suppl 01):142-156.
2. Souza AC, Moraes MCL, Martins LT, Fróes MBC, Salzano ES, Moura MRJ. Traffic as an interdisciplinary theme in health promotion. *Revista Interdisciplinar de Estudos em Saúde.* 2018; 7(1):187-203.
3. Viana APM, Souza AC, Moraes MCL, Porto EF, Abdala GA, Salgueiro MMHAO. Factors related to accidents by falls between elderly residents in a long permanence institution: integrative review. *Revista Brasileira de Saúde Funcional.* 2017; 1(2):32-32.
4. Prince MJ, Wu F, Guo Y, Robledo LMG, O'Donnell M, Sullivan R, et al. The burden of disease in older people and implications for health policy and practice. *The Lancet*, 2015; 385(9967):549-562.
5. Mota LL, Andrade SR. Educational topics for school from the perspective of professionals in the Mobile Emergency Service. *Rev Esc Enferm. USP.* 2016; 50(SPE):114-121.
6. Chassot MD. Riscos ocupacionais da equipe de saúde no atendimento pré-hospitalar: uma revisão integrativa [monografia]. Porto Alegre: Universidade Federal do Rio Grande do Sul, Escola de Enfermagem; 2010.
7. Gonsaga RAT, Brugugnolli ID, Zanutto TA, Gilioli JP, Silva LFCD, Fraga GP. Characteristics of care provided by the Emergency Mobile Care Service in the municipality of Catanduva, São Paulo state, Brazil, 2006-2012. *Epidemiol Serv Saúde.* 2013; 22(2):317-324.
8. Costa IKF, Liberato SMD, Costa IKF, Melo MDM, Simpson CA, Farias GM. Occupational hazards in a mobile emergency care. *Rev. Pesq. (Univ. Fed. Estado Rio J., Online).* 2013; 6(3):938-947.

9. Mafra DAL, Fonseca IC, Viana JX, Santana JCB, Silva MP. Perception of Nurses on the importance of the use of Individual Protection Equipment for Biological Risks in a Service of Mobile Urgency Care. *Mundo Saúde*. 2008; 32(1):31-38.
10. Lúcio MG, Torres MC, Gusmão CMP. Riscos ocupacionais do atendimento pré-hospitalar: uma revisão bibliográfica. *Interfaces Científicas – Saúde e Ambiente*. 2013; 1(3):69-77.
11. Maia ER, Gonçalves J Júnior, Lima EP, Campos W, Jovino EM, Fernandes FF, et al. Medical freshmen's knowledge of pre-Hospital care and basic Life support. *Rev Bras Educ Med*. 2014; 38(1):59-64.
12. Guimarães EPA, Silva RF, Santos JBF. Hope Drivers: working conditions of SAMU ambulance drivers. *O público e o privado*. 2015; 13:55-75.
13. Tipple AFV, Silva EAC, Teles SA, Mendonça KM, Souza ACS, Melo DS. Accident with biological material at the prehospital mobile care: reality for health and non-healthcare workers. *Rev Bras Enferm*. 2013; 66(3):378-384.
14. Brasil. Ministério da Saúde. Portaria nº 424, de 12 de março de 2012. Destina recursos financeiros para aquisição de materiais para o Serviço de Atendimento Móvel de Urgência. Brasília, 2012.
15. SEMUS. Secretaria Municipal de Saúde. SAMU comemora 12 anos de instalação em Palmas. [Internet]. 2018. [citado em 28 nov 2018]. Disponível em: http://www.palmas.to.gov.br/blog_noticias/samu/samu-comemora-12-anos-de-instalacao-em-palmas/1504265/.
16. Almeida PMV, Dell'acqua MCQ, Cyrino CMS, Julian CMC, Palhares VC, Pavelqueires S. Analysis of services provided by SAMU 192: Mobile component of the urgency and emergency care network. *Esc Anna Nery*. 2016; 20(2):1-15.
17. Silva AMA, Shama SFMS. Trauma epidemiology in the samu of Novo Hamburgo during the first three month of 2015. *Saúde e Pesq*. 2017; 10(3):539-548.
18. Abulatif LI. Data Integation Process: an information management model for multiple databases on traffic accidents in Brazil. *Epidemiol Serv Saúde*. 2018; 27:e2017160.
19. Pitteri JSM, Monteiro PS. Characterization of the Assistance of the Mobile Emergency Health Care Service – SAMU - Palmas – State of Tocantins, Brazil, 2009. *Comun Ciênc Saúde*. 2010; 21(3):227-236.
20. Palmas. Secretaria Municipal de Saúde. Dados geográficos de Palmas [Internet]. [S.d.]. [citado em 31 maio 2018]. Disponível em: <http://www.palmas.to.gov.br/>.
21. Dias JM, Lima MSM, Dantas RAN, Costa IKF, Leite JEL, Dantas DV. Profile of state prehospital mobile emergency care service. *Cogitare enferm*. 2016; 21(1):1-9.
22. O'Dwyer G, Konder MT, Reciputti LP, Macedo C, Lopes MGM. Implementation of the Mobile Emergency Medical Service in Brazil: action strategies and structural dimension. *Cad Saúde Pública (Online)*. 2017; 33(7):e00043716.
23. Coster JE, Turner JK, Bradbury D, Cantrell A. Why do people choose emergency and urgent care services? A rapid review utilizing a systematic literature search and narrative synthesis. *Acad Emerg Med*. 2017; 24(9):1137-1149.
24. Peixoto M, Sousa RAF, Odon TI. Núcleo de Estudos e Pesquisas (CONLEG). Senado Federal. Boletim Legislativo nº 36, de 2015. Combate ao Trote Telefônico: uma questão de emergência. Brasília; 2015.
25. Brasil. Gabinete do Ministro. Portaria nº 1.010, de 21 de maio de 2012. Redefine as diretrizes para a implantação do Serviço de Atendimento Móvel de Urgência (SAMU 192) e sua Central de Regulação das Urgências, componentes da Rede de Atenção às Urgências. *Diário Oficial da República Federativa do Brasil*, Brasília, DF, 21 maio 2012.
26. Manoel EO, Arduin EAA. Direito Disciplinar Militar, teoria, prática e doutrina. Curitiba: Associação da Vila Militar; 2004.
27. Santos EM. Trote telefônico: um problema que afeta todo o país. *Âmbito Jurídico*. 2013.

Disponível em: http://www.ambito-juridico.com.br/site/?n_link=revista_artigos_leitura&artigo_id=13365. Acesso em 20/09/2020.

28. Tibães HBB, Silva DM, Alves M, Penna CMM, Brito MJM. Service Profile of the Mobile Emergency Care Service in The North of Minas Gerais State. Rev Pesq. (Univ. Fed. Estado Rio J., Online). 2018; 10(3):675-682.
29. Seyboth MDP, Assada VK, Danielli VR. Delineation of epidemiological profile of calls from mobile emergency medical services—mems, Maringá-PR. Revista Uningá. 2016; 48(1):51-55.