

Mobile prehospital emergency care: an analysis of implementation in the State of Rio de Janeiro, Brazil

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Abstract *Mobile prehospital care is a key component of emergency care. The aim of this study was to analyze the implementation of the State of Rio de Janeiro's Mobile Emergency Medical Service (SAMU, acronym in Portuguese). The methodology employed included document analysis, visits to six SAMU emergency call centers, and semistructured interviews conducted with 12 local and state emergency care coordinators. The study's conceptual framework was based on Giddens' theory of structuration. Intergovernmental conflicts were observed between the state and municipal governments, and between municipal governments. Despite the shortage of hospital beds, the SAMUs in periphery regions were better integrated with the emergency care network than the metropolitan SAMUs. The steering committees were not very active and weaknesses were observed relating to the limited role played by the state government in funding, management, and monitoring. It was concluded that the SAMU implementation process in the state was marked by political tensions and management and coordination weaknesses. As a result, serious drawbacks remain in the coordination of the SAMU with the other health services and the regionalization of emergency care in the state.*

Key words *Emergencies, Mobile emergency units, Public health policy*

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Introduction

Emergency care, a fundamental part of health systems, has been a priority in Brazil since 2003¹, as provided in the National Emergency Care Policy (*Política Nacional de Atenção às Urgências – PNAU*)².

The implementation of Brazil's National Emergency Care Policy can be divided into three main stages: 2000 to 2003 – initial regulation; 2004 to 2008 – expansion of the Mobile Emergency Medical Service (*Serviço de Atendimento Móvel de Urgência -SAMU*), the mobile component of prehospital emergency care; and 2009 – implementation of the fixed component of prehospital care, 24-hour Emergency Care Units (*Unidades de Pronto Atendimento – UPA*)³.

International literature shows that prehospital care^{4,5}, that became a policy priority in Brazil in 2004 through the expansion of the SAMU, yields important results. The decision to begin the implementation of the National Emergency Care Policy through this service was justified based on its importance for assuring reduced response time and regular delivery of emergency care. The SAMU is a nationally-standardized care model, geared towards delivering 24-hour emergency care to homes, the workplace, and thoroughfares. It is aimed at guaranteeing care delivery, appropriate transport, and patient referral to the Unified Health System (*Sistema Único de Saúde - SUS*). Aid can be free requested by telephone from any location in the country by dialing the number 192. The call is answered by an emergency call center (*Central de Regulação Médica*) that determines the most adequate response, be it specific orientations or sending a basic life support or advanced life support ambulance, the latter of which includes a doctor in the medical team. Official documents highlight the potential of the SAMU for organizing the care network^{6,7}.

In 2011, the Health Ministry reformulated its emergency care policy⁸. The new guidelines propose the formation of an Urgent and Emergency Care Network (*Rede de Urgência e Emergência*) comprising of prehospital care (primary care, the SAMU and UPAs), hospital care, and home care.

In 2013, the SAMU 192 was present in all Brazilian states, with 175 emergency call centers covering 1,955 municipalities, which are home to 65% of the Brazilian population⁹. The Health Ministry expected that the SAMU would reach 100% coverage of the Brazilian population by 2018.

The national literature regarding SAMU highlights the following: lack of professional training, the weak structure of care system, lack of coordination between the care units involved in providing emergency care, and the impact of external causes on care delivery^{3,10-17}.

One of the main challenges facing prehospital emergency care is its integration with primary care, the regulatory 'gateway' of the system, and hospitals, the system's 'exit door'¹⁴.

It is also important to highlight the importance of intergovernmental negotiation, given that national regulations provide that the SAMU funding shall be divided between federal (50%), state (25%), and municipal (25%) governments. Coordination between different levels of government is even more important in the case of regional SAMUs. The few studies regarding regional SAMUs reveal the importance of steering committees in relation to the establishment of federative agreements between municipalities^{12,15}.

Since 1986, Rio de Janeiro, the country's second most populous state, which has a high degree of urbanization, has been a pioneer in mobile prehospital emergency care in thoroughfares through the Emergency Aid Group (*Grupamento de Socorro de Emergência - GSE*) of the Military Firefighters Corps (*Corpo de Bombeiros Militar do State of Rio de Janeiro - CBMERJ*). The GSE was responsible for responding to medical or traumatic emergencies in thoroughfares and other public places up to 2004. However, a more wide-ranging emergency service that encompassed emergencies at household level was only implemented after the state government's adherence to the national SAMU strategy.

This study is guided by the following questions: what were the main characteristics of and conditioning factors in the implementation the SAMU in the State of Rio de Janeiro? What is its place within the emergency care policy and network?

This article aims to analyze the implementation of the SAMU in the State of Rio de Janeiro considering the political and institutional context, coordination between health services, and emergency care network management.

Methodology

A case study employing qualitative methods was conducted between 2010 and 2012 based on the analysis of emergency care legislation and documents from the three spheres of government, vis-

its to emergency call centers in the State of Rio de Janeiro, and 12 semistructured interviews with all acting state and regional coordinators during the period: three state emergency care coordinators, and nine coordinators of the six SAMUs that were in operation during the study period. None of the coordinators refused to participate.

The interviews with the state emergency care coordinators lasted between 60 and 100 minutes and were conducted using a guide containing questions addressing the historical background of the policy, the actors involved in the implementation process, current operating status, coordination between the SAMU and the care network, prospects for expansion, state management capacity, the creation of indicators, the performance of steering committees, and advances, limitations and challenges. Visits lasting approximately six hours were made to each of the six SAMU centers: Rio de Janeiro (in the capital); Metropolitano I (in Nova Iguaçu); Metropolitano II (in Niterói); Baía de Ilha Grande (in Angra dos Reis); Médio Paraíba (in Volta Redonda); and Centro-Sul (in Três Rios). During the visits, the SAMU coordinators were interviewed once using a similar guide with additional questions regarding the operating dynamics of each center. Field notes were taken to complement the audio recordings.

The study's conceptual framework was based on Giddens' theory of structuration¹⁸, which uses strategic conduct analysis to explore the relationship between cognitive skills and action strategies displayed by human agents and structural dimensions. For Giddens¹⁸, social practices can be understood as procedures, methods or techniques skillfully performed by social agents using rules and resources. Therefore, agents have broad freedom of action, yet are always conditioned by the structural resources at their disposal.

Here rules are viewed as structural resources, whose normative aspect corresponds to practices from a rights-based perspective, duties and the ways in which these practices can be executed. These resources constitute the facilities or power base that agents can call upon and manipulate to influence their interaction with the other. "Circumstances of the action" are the ways in which social and material phenomena facilitate or restrict human action and are both the means and result of the action.

Access to the agent may come about through discursive consciousness – an actor's ability to verbally express the conditions of his/her own actions – and practical consciousness, or that which

can be understood through observation.

In this case study, the circumstances of the action concern the implementation of the National Emergency Care Policy in the context of the State of Rio de Janeiro. The documents were considered structural resources and the agents were accessed by way of discursive and practical consciousness during the field study. The results of the interviews were analyzed in the following stages: transcription, analysis of recurring themes, revision and refinement of initial categories, and organization and interpretation of the narratives into categories.

The results are presented in the following categories: the SAMU implementation process and its political and institutional context; coordination of SAMU activities with other services; management of the SAMUs.

This study was authorized by the Research Ethics Committee.

Results and discussion

The SAMU implementation process and its political and institutional context

The National Emergency Care Policy was intended to be implemented as a comprehensive and articulated network¹⁹. However, it has been fragmented into components, beginning with the SAMU.

The State of Rio de Janeiro's SAMU was implemented in two stages: the first between 2004 and 2010, which comprised of the implementation of the metropolitan SAMUs *SAMU Metropolitano I*, *SAMU Metropolitano II*, and *SAMU Rio*; and the second that began in 2011 with the implementation of SAMUs in three periphery regions - *SAMU Baía de Ilha Grande*, *SAMU Centro-Sul*, and *SAMU Médio Paraíba*. Figure 1 shows the development of the SAMU in terms of number of municipalities and population covered.

The first two SAMUs implemented in the state were regional, as were the three implemented in periphery regions, whereas the SAMU Rio was municipal. With the implementation of the Metropolitan SAMUs, state coverage increased to approximately 70% of the population. The implementation of SAMUs in periphery regions did not encompass regions with high population densities. Although the Médio Paraíba is the state's second largest inland region, the other SAMUs encompassed the less populated regions of Centro-Sul and Baía da Ilha Grande.

The regional SAMUs in Rio de Janeiro initially differed from the SAMUs in other states, which were generally implemented in the most populous municipalities that benefitted from greater financial resources and enjoyed better health care services. In 2005, only 35.7% of the country's SAMUs were regional, i.e., encompassed more than one municipality. Only in 2008 did the nationwide implementation of regional SAMUs overtake that of municipal services³.

Given the regional nature of the SAMU, intergovernmental coordination is fundamental. The analysis of the implementation process reveals political problems related to lack of agreement between local governments and divergences among municipal and state governments. These issues were raised principally by the coordinators of the Metropolitan SAMUs.

The implementation of the SAMU Metropolitan II in 2004 was the initiative of the local government of Niterói, with strong support from the municipality of São Gonçalo and through agreements with the remaining municipalities. According to the state emergency care coordina-

tor, the implementation of the SAMU in Niterói benefitted from a favorable political climate and technical conditions and the local government committed itself to administering the emergency call center.

Soon after, in 2005, the SAMU Metropolitan I was implemented by the *Consortium da Baixada Fluminense*, which took on the management of the service. The center is located in the municipality of Nova Iguaçu. According to interviewees, the SAMUs Metropolitan I and II only received state support in 2011 after an initiative to reshape the Emergency Care Network (*Rede de Atendimento às Urgências - RAU*).

The SAMU Rio was inaugurated by the state government in 2006. According to interviewees, the reason for the relatively late implementation of the SAMU in the capital was due to the fact that mobile prehospital care was previously provided by the Firefighter Corps – thus requiring a specific coordination strategy – and difficulties in establishing intergovernmental partnerships up to that point. The creation of the State Department of Health and Civil Defense (*Secretaria*

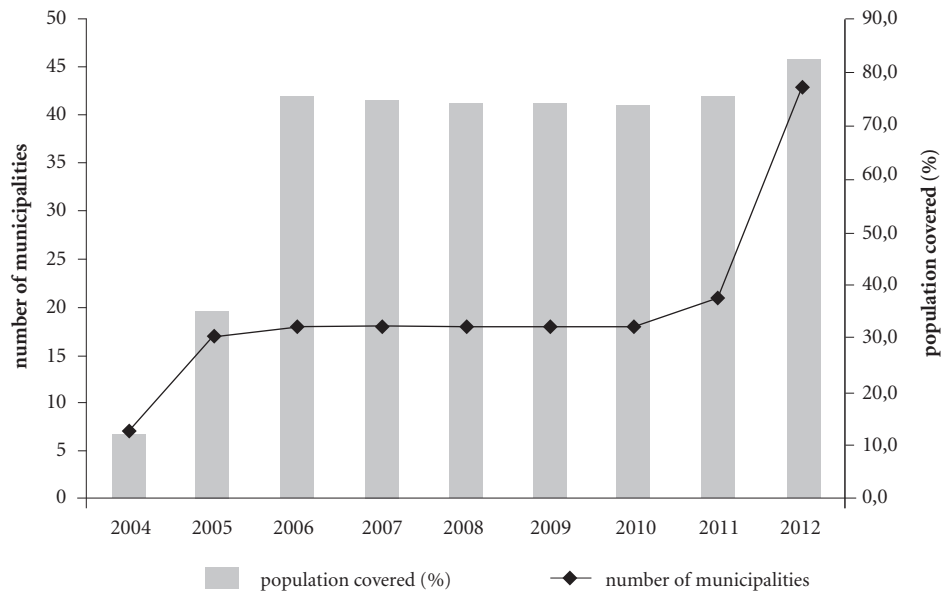


Figure 1. Development of the SAMU in the state of Rio de Janeiro in terms of number of municipalities and population covered between 2004 and 2012.

Source: data regarding the inauguration of the SAMU was obtained during the field research. Population data is from the Brazilian Institute of Geography and Statistics (IBGE, acronym in Portuguese). NB: the year in which the SAMU was inaugurated was considered rather than the date published in the Official Gazette.

Estadual de Saúde e Civil Defense - SESDEC) in 2007 had a major impact on the capital's SAMU. Between 2007 and 2011, when the Firefighter Corps were involved in state health management, the state played a management role only with respect to the SAMU Rio, which included the participation of the Firefighter Corps, while the two metropolitan SAMUs continued under the management of local government.

The Firefighter Corps played such an important role in the SAMU Rio that the SAMU remained part of the organizational structure of Office of Civil Defense even after the latter was separated from the Health Department in 2011. According to the coordinators there was a *'bombeirização'* of the SAMU, from the word *bombeiro* (firefighter), meaning that the service was totally assimilated by the Firefighter Corps.

Everyone in the ambulances are firefighters. The driver, technician, nurse and doctor, regardless of whether it's a SAMU vehicle or red firefighters' vehicle. And no distinction is made between care – the SAMU goes to the streets and goes to homes, and the red vehicle too – the closest available ambulance goes (E 4).

The assimilation of the SAMU Rio by the Firefighter Corps involved certain conflicts, including issues relating to compliance with federal norms such as the competent regulatory authority:

The emergency call center has a doctor who is a "regulation doctor", who is the authority in medical matters. [...] Do you think the firefighters see it like that? No. For the firefighters, they are the ones in charge (E 1).

Conflicts are not limited to the authority of the regulation doctor. Conflicts were also mentioned with respect to noncompliance with dress code and standard of appearance in the SAMU Rio.

'Firefighter' is written on all the ambulances of the SAMU-Rio. And nobody uses overalls. How am I going to make a military put overalls on? (E 1).

Another difference of the SAMU Rio is the fact that there are two types of regulations: primary, applied by a civil doctor, whose role is to determine whether it is necessary to send an ambulance; and secondary, which are applied by a military doctor, who decides what kind of ambulance to send and accompanies the ambulance. Another difference that was found was that the majority of calls are responded by intermediate ambulances with nurses rather than nurse technicians.

The other SAMUs in the state work in partnership with the Firefighters Corps. The latter

responds calls in thoroughfares, while the SAMU prioritizes households. However the calls to the numbers 193 (firefighters) and 192 (SAMU) are not integrated as in the SAMU Rio.

A number of initiatives geared towards integrating the actions of the Firefighters Corps with those of the SAMU were observed. However, in the capital, where this type of integration was institutionalized through the *'bombeirização'* of the SAMU, the SAMU was devolved from municipal and state health departments to the Office of Civil Defense.

The SAMUs in the periphery regions were implemented in the following stages: SAMU Baía de Ilha Grande (2010), followed by SAMU Centro-Sul (2012), and finally SAMU Médio Paraíba (2012). Discussions concerning the implementation of the SAMU Médio Paraíba through a joint funding scheme between the state and Health Ministry began in 2008. However, the implementation of the service was postponed due to lack of definition regarding funding:

Unfortunately, at the time, the state did not offer itself as a co-funder; it didn't even want to fund 25%. 50% would have been a burden for the municipalities. It would have been very complicated, so the municipalities had no alternative but to pull out (E 9).

The three SAMUs implemented in periphery regions are operated by intermunicipal consortiums, with a significant amount of funding coming from municipal and federal sources. On the whole, the state government is not recognized as a collaborator. One interviewee had a positive perception of intergovernmental relations and mentioned that the state government contributed with only one SAMU in periphery regions, providing 25% of funding.

The political climate here is favorable. Compared to other regions, we observe that politics often hamper any kind of regional coordination, but today the political climate is apt... Obviously there are disputes, but, on the whole, the climate is "very positive". This is conducive to a good relationship between the state and federal government and accessing new funds (E 9).

With respect to the SAMUs Médio Paraíba and Centro-Sul, it was observed that the stability of the local government conveyed confidence.

With regard to operating structure, the SAMU Metropolitano II currently operates from the same base and has the same structure and 22 ambulances it started with. At least two years ago a more appropriate location was defined for the implementation of a new emergency call center,

but the center has yet to be transferred. Discontinuity in the management of the municipal health system in Niterói has occurred due to political changes after the elections, hindering investment in infrastructure and affecting the service's ability to respond to growing demand.

We are aware of the access difficulties resulting from poorly-maintained equipment, lack of staff, lack of space in the emergency call center, and population overload that increases demand – the more people there are the more demand – and resulting from the public not knowing how to use the SAMU – the number of prank calls that we receive... that congests the lines, which delays response time. These things end up overburdening the system and staff, and hinder access to 192 (E 6).

The emergency call centers of the SAMU Rio and Metropolitano I have been expanded and re-located.

Given that they are relatively new, the SAMUs in periphery regions are well located and have a compatible fleet of ambulance vehicles.

Table 1 summarizes the main characteristics of the six SAMUs present in the state in 2012, showing that the service achieved 82% population coverage.

In 2012, the number of Advanced Life Support units (*Unidades de Suporte Avançado* - USA) per 1 million population was in accordance with national standards in all regions of the state with SAMU. The number was greater than the recommended average in periphery regions, which may be explained by the fact that the criteria used to define the number of units include both population and distance, while in the municipality of

Rio de Janeiro, the lower rate of USA per 1 million population may be explained by the higher population density and the fact that the teams of the intermediate ambulances include nurses.

The employment status of the staff at the SAMU Rio is different to that of the other services. All staff are members of the military, except for the primary civil regulators, who are employed by a social organization.

With respect to the SAMU Metropolitano I and SAMU Metropolitano II, doctors are employed in a number of different ways, with permanent civil service employees working together with professionals employed on a contract basis with often precarious employment conditions and varying salaries. Each municipality is responsible for employing their own staff.

According to certain interviewees, the employment conditions in consortiums, such as those of the Centro-Sul and Três Rios regions, are better and these organizations can open public recruitment processes. In one of the SAMUs run by a consortium there was a low level of doctor and nurse turnover.

The interviewees suggested consortium management as a way of meeting the expectations of municipalities in relation to each SAMU. One of the advantages of this form of management for the SAMUs in periphery regions was that it ensured uniformity in the salaries of health professionals.

Another critical structural issue related to the implementation of the SAMUs is capacity building, given that urgent care is not recognized as a specialty for doctors and nurses in Brazil. The

Table 1. Summary of the main characteristics of the Mobile Emergency Medical Service (SAMU) in the state of Rio de Janeiro in 2012.

SAMU	Inauguration	Municipalities covered	Estimated population 2012	Nº of USB ⁱ	Nº of USA ⁱⁱ	Total number of ambulances	Number of USA/1 million population ⁱⁱⁱ
Metropolitano II	2004	7	1,974,910	15	7	22	3.5
Metropolitano I	2005	11	3,592,593	32	12	44	3.3
Rio de Janeiro	2006	1	6,390,290	59	15	74	2.3
Baia de Ilha Grande (BIG)	2011	3	254,042	6	2	8	7.8
Centro Sul	2012	11	331,800	7	2	9	6.0
Médio Paraíba	2012	12	857,066	13	7	20	8.1
TOTAL		45	13,400,701	132	56	177	4.1

Source: Health Ministry (www.saude.gov.br) and IBGE (population data). Elaborated by the authors.

i- USB = Basic Life Support Unit (*Unidades de Suporte Básico*). Ambulances used to transport patients classified as not needing a doctor;

ii- USA = Advanced Life Support Unit (*Unidades de Suporte Avançado*). Ambulances used to provide care and transport high-risk patients who need intensive medical care. These ambulances should have a medical professional and the equipment necessary for this type of care;

iii – Recommended federal parameter is 1 USA per 450,000 population, which corresponds to 2.2 USAs per 1 million population.

state emergencies coordinating office and Ministry of Health seek to establish partnerships geared towards providing capacity building in Advanced Trauma Life Support (ATLS) and Basic Life Support (BLS). However, despite the efforts made by the state and federal governments, in practice, the SAMUs have ended up adopting their own ways of providing capacity building for health professionals.

On its own, the municipality was not able by to provide training, so we sought out partnerships. One of the partnerships was with the Firefighters Corps, and the other was with professionals from the network. [...] we went over all the topics addressed by the 2048 (ministerial order) and we invited the people from the network to give the courses (E 7).

Despite the capacity building efforts, local managers revealed that they were apprehensive with respect to the difficulties involved in keeping professionals, especially doctors.

In the SAMU Rio capacity building is the responsibility of the Firefighters Corps, who traditionally trained the military members who worked in the GSE.

Interviewees unanimously stated that the SAMU comprised an advance in emergency care and that there were prospects of expansion:

If the project was bad, the president and minister wouldn't want to cover 100% of the country... Invest in something that doesn't work... The project is good, it has grown, and the municipalities and regions have bought the idea and implemented [the service] (E 9)

... We are implementing because there is no way we can't implement it... All the policies today ... Rede Cegonha (the Stork network), all the various kinds of policies are there "implementing SAMU"... Funding is usually provided as part of "implemented SAMU". We've passed the point of no return (E 7).

However, for the coordinators, the public negatively evaluate SAMU due to access difficulties and lack of understanding regarding what comprises an emergency demand.

But if you ask citizens they say that they can't get through to 192. Or that their call wasn't answered, or there wasn't an ambulance available. (E 4). The public still doesn't know how to use the SAMU. They think that it should solve everything... (E 5).

There are plans to expand the SAMU throughout the State of Rio de Janeiro. The next SAMU is planned for the *Serrana* region, covering 16 municipalities. However, the service had still not been implemented by the end of 2013. According

to the state coordinator of emergencies, the fact that 15 municipal secretaries were replaced after the 2012 elections delayed the agreements.

With respect to other regions that are void of coverage, a proposal to implement SAMUs in the North, Northeast, and *Baixada Litorânea* regions is currently being discussed.

A relatively high rate of turnover of SAMU coordinators was observed. In the metropolitan SAMUs, all the coordinators we replaced at least once during the study period. Seven out of the nine SAMU coordinators and all three state coordinators of emergency services interviewed during the study possessed the relevant qualifications required for the function.

Coordination of SAMU activities with other services

The effective coordination of emergency care depends greatly on the availability of various types of healthcare network services. In this respect, the extent of primary healthcare coverage, availability of inpatient beds, and other types of emergency care services such UPAs, are particularly important. Table 2 shows the estimated coverage of the Family Health Strategy (*Estratégia Saúde da Família* - ESF), number of hospital beds per 1,000 population in the SUS, and number of UPAs in the regions covered by the SAMU in the State of Rio de Janeiro.

The SAMU is also intended to act as an observatory of the healthcare network, where it is expected that primary healthcare coverage influences emergency care. Primary healthcare coverage was greater in periphery regions, followed by metropolitan areas, while the municipality of Rio de Janeiro, where coverage has always been historically low, experienced rapid expansion as from 2010. However, the presence of ESF was not highlighted by local SAMU managers. In this respect, there was only one mention regarding the establishment of a collaborative relationship with primary care services, while for one of the state coordinators the role of primary care in the emergency care network needs to be problematized.

One of the difficulties we have with primary care is communication. Managers are unable to incorporate it [primary care] into the emergency network. Exactly because they are aware of the difficulties involved in incorporating it (E 2).

Despite this mention of primary care by the state coordinator, the majority of interviewees suggest that it is actually the referral hospital network that has a profound effect on SAMU.

Table 2. Estimated coverage of the Family Health Strategy, number of hospital beds per 1,000 population, and number of UPAs in the regions covered by the SAMU in the State of Rio de Janeiro in 2012.

Region	ESF coverage	Nº of beds in the SUS/1,000 pop	Nº of UPAs	Year UPA was inaugurated
Baía de Ilha Grande	76.30%	1.07	1	2010
Centro-Sul	93.53%	5.18	1	2009
Médio Paraíba	76.99%	1.88	3	1st UPA in 2008
Metropolitana I	46.11%	1.65	8	1st UPA in 2008
Metropolitana II	76.63%	2.21	6	1st UPA in 2010
Rio de Janeiro	40.07%	1.97	31	1st UPA in 2007

Source: based on indicators from the Regional Inter-management Committees (Comissões Intergestores Regionais - CIR) and Health Ministry situation room.

We arrive and they always say that there are no beds, that it's full, or they will detain my stretcher... So the "delta t" (time between responses) ends up being very long and hinders the liberation of the vehicle to respond to a new call (E 4).

If we take into consideration the parameters established by the national regulations (2.5 to 3 beds/1,000 population)²⁰, it is possible to observe that, with respect to the supply of beds in the regions covered by SAMU, only the region covered by the SAMU Central-Sul is above the recommended rate. However, there has been an increase in the number of beds throughout practically the whole state, except for three municipalities.

One problem that transcends the structural lack of beds is lack of integration between the services that make up the emergency care network.

We continue working in little boxes. A hospital is a hospital, a UPA is a UPA, the SAMU is the SAMU. None of these elements are incorporated into a network (E 2).

According to federal norms, this network should be formed and made available for the regulation of the SAMU. For the interviewees, agreements regarding standards between managers are not institutionalized, since emergency service doctors do not feel obligated to comply with them. Access to beds often depends on the personal relationship between doctors.

There are shift doctors who understand zero-beds, and shift doctors who say there is no way that they can get in (E 5).

The relationship between the SAMU [teams] and hospitals ends up being a personal one. So the regulating doctor that is on shift says 'ah so-and-so of emergency department so-and-so is my friend, I can put the patients there'. I think that the relation-

ship should be institutional, because that is what guarantees the patient a gateway [into the health system] (E 6).

In periphery regions, despite the relative lack of beds, the relationships are more collaborative.

I know a chief doctor in the emergency care department, I know the chief nurse in the emergency care department; when they have a problem with the SAMU they call me (E 8).

However, there is a problem regarding the place of origin of the patient when the referral is from another municipality that makes up the region.

The role of the state [government] has to be to intermediate these intermunicipal regulations: otherwise... the municipal manager chooses the beds (E 7).

The municipality of Rio de Janeiro's hospital network is the largest in the country. However, it suffers from a low level of governability in relation to beds because the system is made up of municipal, state, federal, private and university hospitals. As a result, the interviewees mentioned that there is a shortage of beds in the capital.

The metropolitan regions lack services and face difficulties when it comes to using health equipment that belongs to the Municipality of Rio de Janeiro, which has been a frequent practice until recently.

People must understand that an ambulance from a Baixada can no longer take a patient to Rio (E 5).

Another important component of emergency care networks that should be part of the SAMU is UPAs. The State of Rio de Janeiro is a pioneer in the implementation of UPAs, which it began in 2007 even before the creation of specific regulations by the federal government. The State of Rio

de Janeiro had 61 UPAs in 2013, which is more than any other state in the country.

One of the requirements for implementing a UPA is that it must be linked to the SAMU. However, it was observed that the UPAs in the three periphery regions were implemented before the SAMUs, contrary to the provisions of the federal regulations²¹. The three state emergency care coordinators were favorable towards the UPAs and considered that they are part of the emergency care network, while some of the interviewees from the metropolitan regions were critical towards the UPAs. Some of the coordinators from the periphery regions considered that the UPAs are part of the regional emergency care system. Other coordinators criticized using UPAs as a strategy to reduce hospital overcrowding and the provide cover for the closure of hospital emergency departments and emergency rooms in small towns.

So a UPA opens – that doesn't solve the SAMU problem, it doesn't solve the emergency problem. Why? Because a UPA is opened while a hospital emergency department is closed. Despite having a primary network that works, the region doesn't have an "exit door" for the chronically ill... the emergency departments are full of elderly, diabetes, orthopedic, and cancer patients... (E – 6).

The state [government] should also be investing in hospitals. Because UPAs are not like primary care, they don't prevent patients from getting sick. They are the "exit door" of primary care. I mean that UPAs should be close to the PSF (Family Health Program). But they locate UPAs close to hospitals. So, instead of filling up just the hospitals, both fill up (E 5).

There is a shortage of beds in the emergency care network across the state. Personal relationships facilitate access to resources, particularly in the periphery regions. Despite studies carried out in the state having shown its importance, primary healthcare coverage was not mentioned by local managers as having an impact on the SAMU^{15,16}. UPAs tend to act as a rearguard for the hospital system and are thus weakly integrated into SAMU.

Management of the SAMUs

Federal regulations have created specific mechanisms for managing and monitoring the SAMU. The National Emergency Care Steering Committee (*Comitê Gestor Nacional de Atenção às Urgências*) was created²² as a formal space to discuss and implement necessary modifications to the comprehensive emergency care system. In addition to the national committee, state, region-

al and municipal steering committees should be established.

The national steering committee has been deactivated. The state steering committee, whose implementation was delayed, was also considered inactive by the three state emergency care coordinators, while Rio de Janeiro's municipal steering committee has never been created. The steering committee of the SAMU Metropolitana II demonstrated consistent performance up to 2008, which facilitated the regionalization of emergency care in the region¹², but has not met since then. The regionalization of emergency care depends partially on the performance of these steering committees. The regionalization of the SAMUs is considered weak, is dependent on the municipalities, and receives little support at state level.

Because you have a general coordinator who is placed to manage a region – but in fact he/she doesn't manage anything, because each municipality has a local manager – who has the power base. I, as general coordinator, end up being only a formal figure head (E 6).

There were municipalities that would refuse to pass the border – 'I provide care up to the river here; after the river that's it'. Then things began to change and we managed to change a lot of things. Each change of mayor leads to enormous operational costs; you have to negotiate all over again, explain how it works, why he/she can't think that the ambulances are his/hers (E 5).

The steering committee of the SAMU Metropolitana I, the least active, was influenced by the Regional Management Body (*Colegiado de Gestão Regional - CGR*).

The CGR is not going to be a partner of the consortium, unfortunately. It competes technically, in terms of implementing health policies; competing politically, with respect to power. (E 5).

The committees are more active in the periphery regions. The three local coordinators confirmed that the regional steering committees held monthly meetings.

In 2011, the Health Ministry proposed the creation of State and Municipal Steering Groups (*Grupo Condutor Estadual e Municipal*) in each state, while maintaining the existing steering committees. The interviewees viewed this duplication of regulating bodies as a problem.

What's happening is that the emergency steering group is not replacing the emergency steering committee (E 3).

With respect to monitoring the SAMU, the policy provides that centers should present service performance indicators, such as response

times, care profile, and mortality rates, on a quarterly basis.

The SAMUs studied here produce quarterly indicators that are sent to the Health Ministry. However, these indicators are neither used for local planning nor sent to the state government.

Few SAMUs currently use the software provided by the Health Ministry. The federal government has indicated that it will be implementing a new SAMU information system. However, the solution found by the various centers is to implement their own system. The SAMU coordinators recognize that individualized systems do not help the SAMU fulfill its role as health observatory, since there is no communication between the systems, thus hindering the development of a national data base to provide input for integrated planning.

Despite advances in the implementation of regional SAMUs, the state government plays little part in planning and monitoring of the SAMU's activities in Rio de Janeiro. Weaknesses were identified in relation to the state government's involvement in management and funding, and it was observed that the steering committees are generally ineffective. The state steering group recently analyzed the regional emergency care plans.

Conclusion

Despite being a relatively new service, it could be said that the SAMU has played a key role in shaping emergency care in Brazil.

The findings of this study reveal a number of advances, limitations, and organizational challenges facing mobile prehospital emergency care related to the political and institutional context, coordination with other services, and emergency care network management.

It also shows that the SAMU implementation process is conditioned by the trajectory of prehospital emergency care, the government drive to develop and promote the service, intergovernmental relations, and leadership of the local managers.

The State of Rio de Janeiro, with its extensive hospital network and prior experience in mobile prehospital care, got ahead of itself with the implementation of the regional SAMUs, leading to the need for improved intergovernmental coordination.

Brazilian federalism is one of the challenges facing the regional organization of the health

system, given that health regions must be built, governed, and funded through intergovernmental agreements and negotiations. Regionalization is a political process that requires certain entities to make concessions and affects power relations. It is therefore necessary to transcend the political and administrative boundaries of federative entities in order to promote the integration of the healthcare network, without however disregarding them²³.

The results of this study are consistent with the findings of a recent study that demonstrated that, despite the continuing challenges related to federal coordination, political coalitions between federal, state and municipal governments contributed towards shaping the emergency care network in the State of Rio de Janeiro²⁴.

Based on Giddens' theory of structuration¹⁸, the SAMU in the State of Rio de Janeiro gained substantial recognition and meaning as a tool for enhancing prehospital care. The consistency of the PNAU may be considered a structural feature in the form of "facility". The "circumstances of action" were positively influenced by the government drive to develop and promote the service and the efforts made by the municipal secretaries.

However, although the 'circumstances of the action' for the implementation of the SAMU in the state have been relatively favorable, not all regions are covered by the service. Furthermore, although in general the SAMUs were initially implemented with sufficient structural resources, the replacement of these resources has differed by region, particularly in the metropolitan regions. One of the weaknesses highlighted in relation to authoritative resources was the weak governability of the steering committees, which has serious consequences for the legitimization of regulatory activities. The main restriction observed by the study was the limited role played by the state government. Addressing the constraints highlighted by this study is essential to ensuring the expansion and effective operation of mobile prehospital care in the state.

One of the limitations of the study was the lack of access to SAMU production indicators, which were not made available by the managers despite requests.

The findings of this study suggest that the piecemeal expansion of specific services raises challenges related federal coordination and regulation, and the coordination of the units that make up the care network, which must be addressed to ensure the effective implementation of Brazil's emergency care policy.

Collaborators

G O'Dwyer was responsible for study conception and design, data analysis and interpretation, carrying out field research, drafting this article and its critical review and approval of the version to be published. CV Machado was responsible for study conception and design, data analysis and interpretation, drafting this article and its critical review and approval of the version to be published. RP Alves was responsible for carrying out field research and drafting this article and its critical review and approval of the version to be published. FG Salvador was responsible for carrying out field research and drafting this article and its critical review and approval of the version to be published.

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