ORIGINAL ARTICLE

Brazilian Policies and Programs in Urgent and Emergency Care Services in the Context of Cardiovascular Diseases: A Scoping Review

Liza Yurie Teruya Uchimura,[1] Cintia de Freitas Oliveira,[2] Mabel Fernandes Figueiró,[1] Camila Pereira Pinto Toth,[1] Camila Roncon de Lima,[1] Patricia Vendramim[1]

Hcor,[1] São Paulo, SP – Brazil
Instituto de Saúde, Secretaria Estadual de Saúde de São Paulo (SES-SP),[2] São Paulo, SP – Brazil

Abstract

Introduction: Cardiovascular diseases (CVD) are a major cause of mortality in Brazil, requiring the improvement of healthcare mechanisms that can promote rapid and effective care for patients.

Objectives: To identify and characterize Brazilian policies and programs (PP) regarding urgency and emergency care in the context of CVD.

Method: The scoping review followed recommendations from the Joanna Briggs Institute (JBI). The search for studies was conducted across seven databases. The screening and eligibility steps were performed by reviewers independently, with conflicts resolved by consensus or consultation with a third reviewer. The data extraction was done in a spreadsheet and the information was analyzed and grouped by content similarity.

Results: Through the analysis of 14 studies, a systematic and contextualized understanding was gained regarding 10 PPs implemented in the urgency and emergency network (RUE) for individuals with CVDs. SAMU emerged as the most extensively studied PP, predominantly in the state of Minas Gerais. The diseases most commonly addressed in these studies included acute myocardial infarction (featured in 80% of publications), stroke, acute coronary syndrome, heart failure, and atrial fibrillation. These PP have demonstrated significant improvements in clinical outcomes, particularly in reducing morbidity and mortality rates. The studies also revealed important insights into barriers and drivers related to infrastructure, health education, and system management and coordination.

Conclusion: The evidence gathered provides significant contributions to guide future policy development and improve decision-making in clinical management for cardiologists.

Keywords: Emergencies; Health Policy; Cardiology; Cardiovascular Diseases.

Introduction

Cardiovascular diseases (CVD) are the main cause of death in the world.[1] In Brazil, coronary artery disease ranks as the leading cause of mortality among CVDs, followed by stroke.[2]

Given Brazil's demographic landscape and epidemiological profile, characterized by an aging population with high rates of morbidity and mortality due to accidents and other forms of violence, the Urgency and Emergency Network (RUE) emerges as a critical component of the Health Care Network (RAS).[3] However, despite its pivotal role in organizing care for these conditions, the RUE faces several challenges that hinder its effectiveness, including inadequate regulatory mechanisms, financial management difficulties across different governmental levels, a lack of evaluation and monitoring culture, and weaknesses in information systems.[4]

Faced with the pressing need to develop, assess, and enhance healthcare services, this review aims to identify and characterize Brazilian policies and programs (PP)

Central Illustration: Brazilian Policies and Programs in Urgent and Emergency Care Services in the Context of Cardiovascular Diseases: A Scoping Review
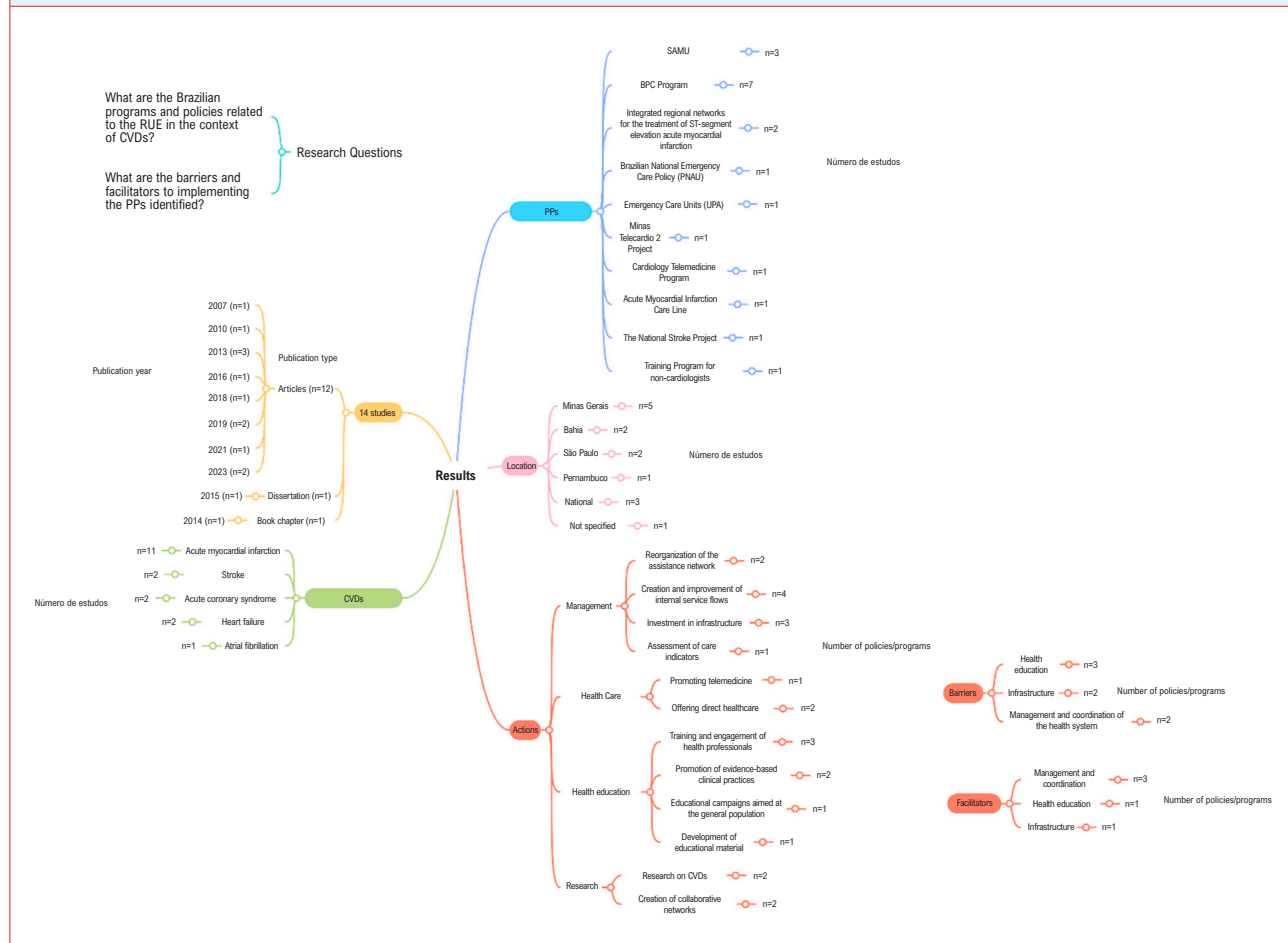
Int J Cardiovasc Sci. 2024; 37:e20240056

CVD: cardiovascular diseases; PP: policies and program; RUE: Urgency and Emergency Network; BPC: Good Practices in Cardiology

in urgency and emergency care in the context of CVDs. The review is conducted within the actions of the Good Practices in Cardiology (BPC) program, which aims to enhance care for major CVDs through evidence-based health promotion strategies.[5] Aligned with the principles of knowledge translation, understanding these PP systematically, along with their associated challenges and solutions, can provide critical insights for continuously improving BPCs and other initiatives within Brazil's Unified Health System (SUS).

Method

A scoping review was carried out following the Joanna Briggs Institute (JBI) manual for evidence syntheses.[6] The protocol for this review was developed and registered on the OSF platform (https://doi.org/10.17605/OSF.IO/

BYNTR). The research question was formulated using the PCC (Population, Concept, Context) framework to explore PPs concerning the RUE in the context of CVDs in Brazil. Therefore, the scoping review was guided by the following research question: What are the Brazilian programs and policies related to the RUE in the context of CVDs? The following sub-question complemented this guiding question: What are the barriers and facilitators to implementing the PPs identified?

For the elements of the research question, only PP implemented to make the RUE operational were considered, excluding isolated actions or PP under the preparation phase. In this context, CVDs were included, allowing studies with other diseases as long as CVDs were also addressed. Peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis and pulmonary

embolism were excluded. The Brazilian territory was the only one considered.

Regarding the type of studies, primary and secondary or tertiary studies were included, whether indexed or not, without restrictions regarding the study design. Congress abstracts, protocols, clinical guidelines or other documents without access to the full text were excluded.

The selected studies were restricted to English, Portuguese and Spanish languages. The search was conducted in the following information sources and databases: PubMed, Embase, Cochrane Library, VHL, Epistemonikos, and Health System Evidence. Moreover, grey literature searches were conducted, including the Capes Theses and Dissertations Catalog and Google Scholar. The search terms were established according to the research question, using prior mapping of potentially eligible studies and consultation of the Health Sciences Descriptors (DECS) and the Medical Subject Headings (MeSH terms).

In order to increase the probability of retrieving studies of interest, the reference list of each article included at the end of the selection (eligibility) stage was also consulted. No limits were established regarding the publication date.

After removing duplicates using Mendeley software, the records were included in the Rayyan platform. This platform was used both in the screening processes (selection by title and abstract) and eligibility (selection by full text). The title and summary of each record identified in the databases/platforms were reviewed independently by two researchers, and disagreements were resolved by consensus. In Google Scholar, the items on each page were consulted until the records ceased to have any relation to the topic. The studies selected during the screening phase were then thoroughly reviewed independently by two reviewers, with any conflicts resolved through consensus or consultation with a third reviewer.

An extraction spreadsheet was created based on the elements of the research question, including information such as authors, type of institution of the first author, year of publication, study design, objectives, policies or programs (name, date of creation/implementation, objectives, initiatives developed, responsible for implementing the initiative, place of implementation, RAS point of care, CVDs, characteristics of the population, social actors portrayed in the study, barriers and facilitators for the implementation of the policy or program, other relevant results, study financing and conflicts of interest. Each article was extracted by a reviewer, with extraction checking by another researcher on the team. Disagreements were resolved by consensus. A calibration exercise was performed before the extraction began to validate the spreadsheet and align the information collection.

The data collected was analyzed using the elements of the research question as a reference. For this reason, the information collected was categorized and grouped by content similarity. This review's report was based on the PRISMA extension for scoping reviews (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews [PRISMA-ScR] Checklist).[7]

Results

Exactly 16,373 records were retrieved from the different information sources consulted. After removing duplicates (n = 15), 16,358 documents were screened, and 38 were evaluated in full. At the end of the selection, 14 documents were included in the review, nine of which were obtained from the search and five from the reference list of articles reviewed in full text (Table 1). The list of articles excluded in the eligibility stage, with the appropriate justifications, can be accessed on the OSF platform (https://osf.io/4tyqb/?view_only=0195952ead7f4677ab2df94eaf27e15b). The selection process is described in the figure below (Figure 1).

The documents included were mostly articles (n = 12),[9,11-17,19-22] published between 2007 and 2023 (Table 1). Regarding the articles, 75% were published in Brazilian journals (n = 9),[9,11-14,17,19,21,22] with emphasis on Arquivos Brasileiros de Cardiologia with six publications.[12,14,17,19,21,22]

Regarding CVDs, approximately 80% of studies addressed acute myocardial infarction (n=11).[9-15,17-20] Three other conditions appeared in two studies: stroke,[9,16] acute coronary syndrome,[21,22] and heart failure.[21,22] Finally, atrial fibrillation was portrayed in one study.[22]

Ten PP related to urgency and emergency care were identified in the context of eligible CVDs (Table 2). Out of the 14 studies included, three aimed to analyze the Mobile Emergency Care Service (SAMU)[11,18,19]

Table 1 – Description of included studies. São Paulo, 2023.					
Author	Year	Document Type	Study objectives	Design	Financing
Luz et al.[9]	2010	Article	To analyze the association between indicators related to the PNAU and certain health indicators related to stroke and acute myocardial infarction in the elderly population of selected municipalities in the State of Minas Gerais	Ecological study	CAPES Foundation
Santos[10]	2015	Dissertation	To analyze the impact of UPA on the death rate from AMI in the capitals and metropolitan regions of Brazil	Ecological study	Not informed
Oliveira et al.[11]	2019	Article	To evaluate the performance of the SAMU in the "ABC" region, using myocardial infarction as a tracer condition	Ecological study	CNPq
Marino et al.[12]	2016	Article	To describe the profile of ACS cases treated in the period preceding the implementation of the program	Observational study	FAPEMIG CNPq CAPES Foundation FINEP
Souza et al.[13]	2019	Article	To describe the role of nursing in the Cardiology Telemedicine Program implemented in Pernambuco, Brazil	Descriptive study with a qualitative approach	Not informed
Marcolino et al.[14]	2013	Article	To evaluate the implementation of the AMI Care Line in Belo Horizonte, Minas Gerais, and its impact on hospital mortality due to AMI	Observational study	Not funded
Filgueiras Filho et al.[15]	2018	Article	To describe temporal trends in 30-day mortality and identify predictors of mortality among patients with STEMI enrolled in a prospective study in Brazil	Observational study	State Department of Health - Telemedicine of Bahia
Martins et al.[16]	2013	Article	To describe the evolution of stroke care in Brazil in the last decade: the main characteristics of stroke care before 2008; the pilot study in a city in southern Brazil between 2008 and 2010, leading to the creation of the Brazilian Stroke Project; finally, the key points of the National Stroke Policy Act of 2012	Experience report	Not funded
Cesar et al.[17]	2021	Article	To reduce hospital mortality rates caused by acute myocardial infarction by training emergency professionals in the city of São Paulo	Experience report	Not funded
Sawaya Neto et al.[18]	2014	Book chapter	To analyze whether the units of the SAMU, originally created through a bilateral agreement with the government of France and later expanded to a larger part of the national territory, positively impact the performance of the SUS, mainly in relation to emergency services	Impact assessment	Not informed
Brasileiro[19]	2007	Opinion article	Not informed	Opinion article	Not informed

Solla et al.[20]	2013	Article	To describe the development and operation of the Integrated Regional Network for the treatment of STEMI in Salvador, Bahia, Brazil, and define its basic components. Furthermore, to present a preliminary STEMI registry, including demographic, clinical data, interval times and primary reperfusion characteristics of patients, and discuss obstacles faced in the implementation, operation and future improvement of this network	Experience report	Telemedicine from Bahia
Passaglia et al.[21]	2023	Article	To characterize the hospitalization data of patients with ACS and HF, participants in the BPC Program in a Brazilian public tertiary hospital, as well as to evaluate adherence rates to therapies based on evidence, as determined by the SBC and defined as performance indicators	Cross-sectional study	Support Program for the Institutional Development of the SUS (PROADI-SUS) American Heart Association CNPq FAPEMIG
Bertoletti[22]	2023	Article	To analyze the study by Pasaglia et al., 2023 and the importance of using evaluation and monitoring metrics for the BPC Program	Editorial	Not informed

Source: Prepared by the author. Objectives extracted in full from the studies. BPC: Good Practices in Cardiology; SUS: Unified Health System; PNAU: Brazilian National Care Policy; UPA: Emergency Care Units; AMI: Acute Myocardial Infarction; SAMU: Mobile Medical Emergency Service; CAPES: Coordination for the Improvement of Higher Education Personnel; ACS: acute coronary syndrome; CNPq: Brazilian National Council for Scientific and Technological Development; FAPEMIG: Minas Gerais State Research Support Foundation; FINEP: Studies and Projects Financier; STEMI: ST-segment elevation myocardial infarction; HF: heart failure; SBC: Brazilian Society of Cardiology

and two the Good Practices in Cardiology (BPC) Program[21,22] and the integrated regional networks for the treatment of acute myocardial infarction with ST-segment elevation.[15,20] Most of the PP were presented in locations in the state of Minas Gerais (n=5),[9,12,14,21,22] and three works brought analyses and discussions from a national perspective[10,16,18] (Table 2).

The PPs activated several points of the RAS in Emergencies, with SAMU being the most cited service in the studies (n=7),[9,11,12,14,16,18,19] followed by Hospitals (n=6),[14-17,21,22] and UPAs (n=4).[10,13-15] Finally, Basic Health Units (UBS) were included together with urgency and emergency services in a study.[9]

PP adopted several strategies against CVD (Table 3), which were grouped into four categories: Management, Health Care, Health Education, and Research.
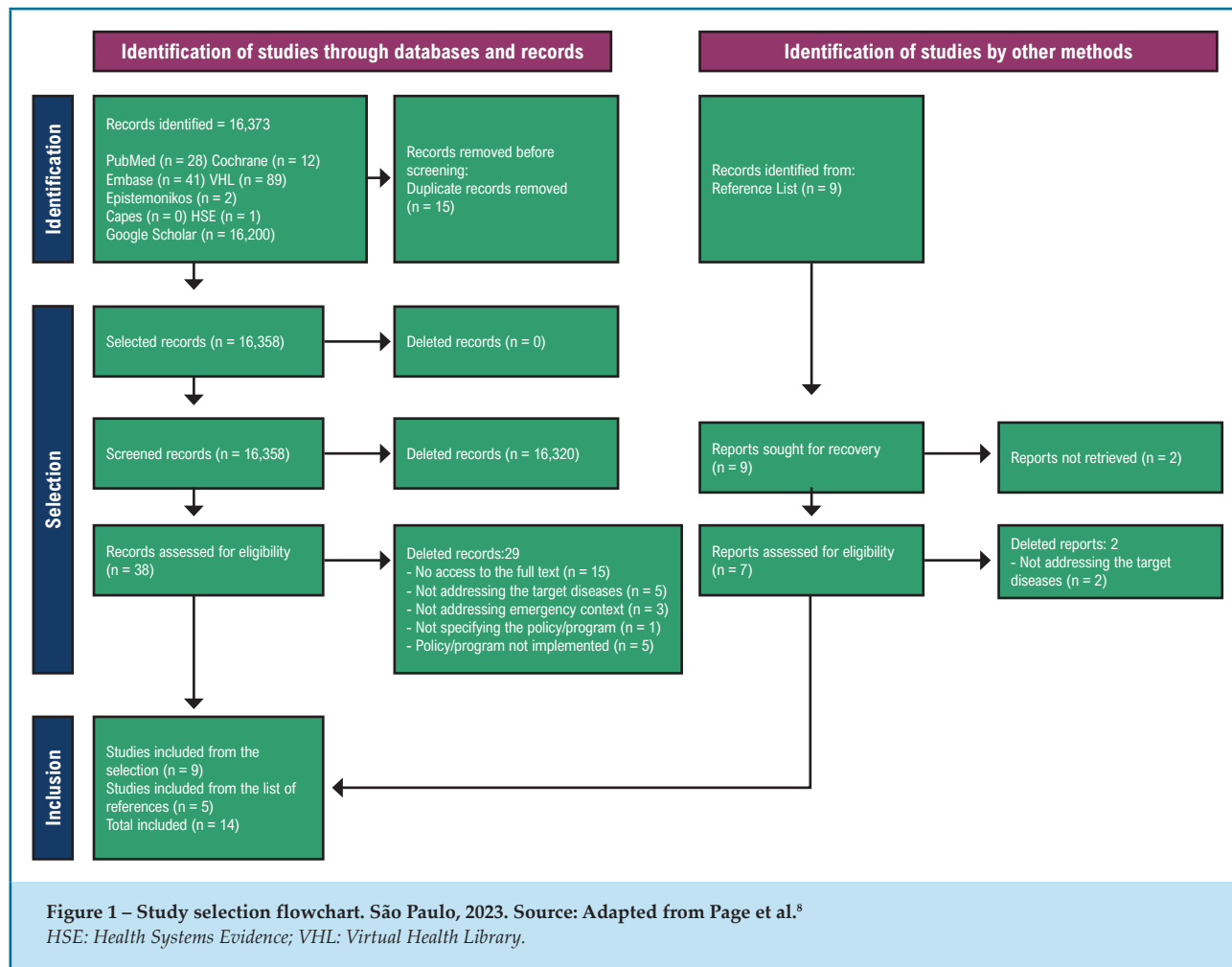
Half of the PP identified involved management actions, with seven of them promoting the reorganization of the care network,[9,11,12,14,16,20] including the regionalization of services and the implementation of care lines. Other actions focused on the development and improvement of internal service flows (n=4),[13-15,22] infrastructure

investments (n=3),[11,14,16] such as the availability of ambulances and the construction of equipment, and initiatives focused on the evaluation of assistance indicators (n=1 policy/program).[21,22]

The "Health care" category covered five initiatives PP,[10,13-16,20] with emphasis on the promotion of telemedicine in four of them. Additionally, two initiatives focused on direct health care, including the creation of emergency care units[10] and support for families of stroke patients.[16]

The "Health Education" category was covered in five PP.[14,16,17,19,21,22] Three of them[14,16,17] employed strategies for training and engaging health professionals, including team training and dissemination of clinical protocols. Activities to promote clinical practices based on scientific evidence were observed in three PP,[19,21,22] in addition to educational campaigns for the general population (n=1)[16] and creation of educational materials (n=1).[17] In the "Research" category, two PP[16,20] promoted studies on CVDs and formed collaborative networks of researchers.

The included studies provided results on the effect of eight of the 10 PP identified in the review (Table 4). Six PP were associated with a reduction in mortality

Figure 1 – Study selection flowchart. São Paulo, 2023. Source: Adapted from Page et al.[8]
HSE: Health Systems Evidence; VHL: Virtual Health Library.

due to AMI and stroke,[9-11,14,15,17,18] in addition to hospital morbidity due to AMI.[9] Likewise, four of them allowed patients access to specialized care,[14,16,19] although one study showed increased hospitalization costs.[14]

Two PP[14,17] resulted in an increased number of trained professionals, while four of them demonstrated an improvement in the quality of care.[15-17,21] This improvement was related to both the reduction in time between assistance, examinations, diagnosis and treatment,[15] as well as adherence to practices based on current clinical recommendations.[15-17,21] In the latter case, for example, one of the PP found adherence above 85% in six of the seven indicators analyzed in the treatment of acute coronary syndrome and three of the five evaluated for heart failure.[21,22]

Seven studies (50%),[14,16-21] referring to six policies, identified barriers and/or facilitators for the implementation of these initiatives (Table 5). Among the barriers, three PP described challenges related to

health education,[17,19,20] two PP addressed infrastructure issues,[19,20] and two mentioned barriers in the management and coordination of the health system.[19,20] On the other hand, three PP pointed out items related to management and coordination[16,18,21] as facilitators, one in the context of health education[21] and the other related to infrastructure.[14]

Discussion

This review presents findings from studies that characterize Brazilian PPs in urgent and emergency care related to CVDs. All studies included were conducted post the 2010 restructuring of SUS following the RAS model and its thematic networks, with one exception,[23] demonstrating the impact of this health policy on healthcare organization, specifically within the RUE, albeit not exclusively for CVD. The significance of SAMU and the effective integration of UBS as a primary point for emergency care are emphasized, underscoring

Table 2 – PPs for emergency care in the cardiovascular setting. São Paulo, 2023.				
Policy or Program	**Author**	**Description of the study policy/program***	**Location**	**Diseases addressed**
National Emergency Care Policy (PNAU)	Luz et al.[9]	**Objective:** To promote the reorganization of health care. To reduce hospitalizations and deaths due to conditions for which pre-hospital care is effective.	137 municipalities in Minas Gerais	Stroke AMI
Emergency Care Units (UPA)	Santos[10]	**Implementation:** Most states started implementing UPAs from 2010	358 municipalities located in all geographic regions of the country	AMI
SAMU	Oliveira et al.[11]	**Implementation:** SAMU was created in 2003. It was implemented in 2004 in the municipality of Santo André, expanding to other municipalities in the "ABC" region between 2004 and 2005 **Objective:** Provide mobile pre-hospital emergency care service	São Paulo "ABC" Region	AMI
	Sawaya Neto et al.[18]	**Implementation:** SAMU was implemented in 2003 and made official in 2004 **Objective:** SAMU is integral to the mobile pre-hospital component of the Emergency Care Network (RAU) and aims to decrease mortality rates, minimize the incidence of complications, and reduce hospital admission costs across various illnesses. By decreasing hospitalization durations, SAMU serves as a primary tool in emergency networks for optimizing response times. **Entity responsible for implementing the initiative:** Brazilian Ministry of Health	National	AMI
	Brasileiro[19]	**Implementation:** SAMU was created by the Ministry of Health in 2003 through ordinance 1,864, dated September 29, 2003	Not informed	AMI
Minas Telecardio 2 Project	Marino et al.[12]	**Objective:** To implement the AMI care line in the Expanded North Region of MG, in accordance with ordinance 2,994, dated December 2011 from the Ministry of Health **Entity responsible for implementing the initiative:** Telecare Network of Minas Gerais, a partnership of six public universities in Minas Gerais coordinated by the Hospital das Clínicas of the Federal University of Minas Gerais	Northern Region of Minas Gerais	AMI
Cardiology Telemedicine Program	Souza et al.[13]	**Objective:** Through telemedicine, the program aims to guide the requesting unit regarding the appropriate conduct for the patient being treated.	Pernambuco	AMI
Acute Myocardial Infarction Care Line	Marcolino et al.[14]	**Implementation:** 2011 **Objective:** To organize the AMI care line in Belo Horizonte **Entity responsible for implementing the initiative:** Belo Horizonte Municipal Health Department	Belo Horizonte - Minas Gerais	AMI

Integrated regional networks for the treatment of ST-segment elevation myocardial infarction (Regional STEMI Network)	Filgueiras Filho et al.[15]	Not informed	Salvador - Bahia	AMI
	Solla et al.[20]	**Implementation:** 2009 **Objective:** To increase rates of reperfusion therapy, to maintain the lowest possible Door-to-Balloon and Door-to-Needle Times, and ultimately to reduce morbidity and mortality associated with ST-segment elevation myocardial infarction (STEMI)	Salvador - Bahia	AMI
The National Stroke Project	Martins et al.[16]	**Implementation:** 2008 **Objective:** The National Stroke Project included a task force of stroke neurologists who founded the Brazilian Stroke Network, aiming to provide scientific support for the establishment of a national network to improve stroke awareness, education, care, and research throughout the country	National	Stroke
Training Program for non-cardiologists	Cesar et al.[17]	**Implementation:** 2010 **Objective:** To reduce the hospital mortality rate related to ST-segment elevation myocardial infarction by providing a training program for emergency professionals (physicians, nurses and others) in the city of São Paulo	Sao Paulo, SP	AMI
Good Practices in the Cardiology Program	Passaglia et al.[21]	**Objective:** To evaluate the rate of adherence to the Brazilian Society of Cardiology guidelines, as well as to evaluate the results of implementing a quality program on clinical outcomes of patients hospitalized for CVD **Entity responsible for implementing the initiative:** Brazilian Cardiology Association (SBC) and the Ministry of Health, together with the American Heart Association and in collaboration with the Hospital do Coração de São Paulo - Hcor	Minas Gerais	Acute coronary syndrome Heart failure
	Bertoletti[22]	**Objective:** By adapting the American Heart Association's Get With The Guidelines program, the initiative aims to lower hospital mortality rates, enhance hospital procedures — with a specific emphasis on safety and quality of care for cardiology patients — and acknowledge hospitals achieving excellence in cardiology as designated centers. **Entity responsible for implementing the initiative:** Brazilian Society of Cardiology (SBC) in partnership with the Brazilian Ministry of Health and support from the American Heart Association (AHA) and Hcor	Minas Gerais	Acute coronary syndrome Atrial fibrillation Heart failure

*Source: Prepared by the author. AMI - Acute myocardial infarction; CVD: Cardiovascular diseases. *Information taken from studies, in the absence of data on implementation, objectives and entity responsible, the topic was omitted from the table; SAMU: Mobile Emergency Care Service.*

Policy or Program	Author	Initiatives	Categories
Table 3 – Initiatives implemented by Policies/Programs. São Paulo, 2023.			
National Emergency Care Policy (PNAU)	Luz et al.[9]	Reorganization of the assistance network	Management
Emergency Care Units (UPA)	Santos[10]	Promoting direct clinical care	Health care
SAMU	Oliveira et al.[11]	Creation of a regionalized regulation center Provision of ambulances and motorcycles for basic and advanced life support	Management
	Sawaya Neto et al.[18]	Creation of Emergency Regulation Centers Regionalization strategies or positioning of SAMU teams across the territory	Management
	Brasileiro[19]	Definition of a pre-hospital approach algorithm based on the guidelines of the Brazilian Society of Cardiology	Health education
Minas Telecardio 2 Project	Marino et al.[12]	Implementation of the AMI care line	Management
Cardiology Telemedicine Program	Souza et al.[13]	Telemedicine: Online electrocardiogram support for 24-hour call center service Flow construction	Health care Management
Acute Myocardial Infarction Care Line	Marcolino et al.[14]	Creation of a coronary unit and hemodynamics laboratory Implementation of the tele-electrocardiology system Institution of pre-hospital electrocardiogram (ECG) Disclosure of clinical protocol Training and motivating healthcare teams Operational flow creation Care line implementation	Management Health care Health education
Integrated regional networks for the treatment of ST-segment elevation myocardial infarction (Regional STEMI Network)	Filgueiras Filho et al.[15]	Definition of assistance flows Implementation of tele-electrocardiology	Management Health care
	Solla et al.[20]	Organization of the assistance network Use of Telemedicine Centers Creation of a research group to record and monitor STEMI in Salvador, Bahia.	Management Health care Research
The National Stroke Project	Martins et al.[16]	Creation of the Brazilian Stroke Network, with education, care and research initiatives Organization of stroke care in the country, with the creation of specific centers and a stroke care line Educational campaigns Emergency medical services training Development of stroke centers within secondary and tertiary hospitals across the country Improvement in the prevention of cerebrovascular risk factors in public outpatient clinics Implementation of early rehabilitation programs Family support Introduction of telemedicine for stroke care in the country Home care establishment	Management Health care Health education Research

Training Program for non-cardiologists	Cesar et al.[17]	Development of educational material Online and in-person training Monthly updates	Health education
Good Practices in the Cardiology Program	Passaglia et al.[21]	Promotion of good care practices Assessment of adherence to the recommendations of the Brazilian Society of Cardiology guidelines	Management Health education
	Bertoletti[22]	Improvement of hospital processes Promotion of safety and good care practices Assessment of the adherence rate of health professionals to the recommendations of the Brazilian Society of Cardiology and the American Heart Association guidelines	Management Health education

Source: prepared by the authors. Based on information collected in the referenced studies.SAMU: Mobile Emergency Care Service

Table 4 – Results achieved by PPs. São Paulo, 2023.

Policy or Program	Endpoints					
	Mortality	Hospital morbidity	Access	Health education	Costs	Quality of care
Brazilian National Emergency Care Policy (PNAU)	(-) Stroke in males*[9] (-) AMI in females*[9]	(-) AMI in females*[9]				
Emergency Care Units (UPA)	(-) AMI[10]					
SAMU	(-) AMI[11] (-) AMI[18]		(+) health care/equipment[19]			
Acute Myocardial Infarction Care Line	(-) AMI[14]		(+) High complexity hospitals[14]	(+) Qualified professionals[14]	(+) hospitalization costs[14]	
Integrated regional networks for the treatment of ST-segment elevation myocardial infarction (Regional STEMI Network)	(-) AMI[15]		(+) specialized care[15]			(+) use of evidence-based practices[15] (-) time between assistance, examination and ECG report[15] (+) Reperfusion rate[15]
The National Stroke Project			(+) Specialized care[16]			(+) Reperfusion rate[16] (+) Clinical improvement[16]
Training Program for non-cardiologists	(-) AMI[17]			(+) Qualified professionals[17]		(+) use of evidence-based practices[17]
Good Practices in the Cardiology Program						(+) use of evidence-based practices[21,22]

Source: prepared by the authors.* With the SAMU component; AMI: Acute myocardial infarction ECG: electrocardiogram; SAMU: Mobile Emergency Care Service. (-) reduction (+) increase

11

Uchimura et al.
Policies related to urgent and emergency care in cardiology

Int J Cardiovasc Sci. 2024; 37:e20240056
Original Article

Table 5 – Barriers and facilitators. São Paulo, 2023.

Policies	Barriers			Drivers		
	Infrastructure	Health education	Management and Coordination of the Health System	Infrastructure	Health education	Management and Coordination of the Health System
SAMU	- Lack of intervention centers for angioplasty[19]	- Failure to use evidence-based practices (difficult routine use of pre-hospital thrombolysis)[19]	- Difficulty accessing the public network[19]			- Using the Emergency Regulation Center (CRU) is essential for the selection of optimal treatment options and deploying the SAMU team[18] - Distribution of teams throughout the territory in a regionalized manner[18] - Construction of regional action plans[18]
Acute Myocardial Infarction Care Line				- Implementation of a tele-electrocardiology system[14]		
Integrated regional networks for the treatment of ST-segment elevation myocardial infarction	- Low level of computerization of the health system, making records difficult[20] - Insufficiency of hospital beds in coronary units/cardiology reference centers[20]	- Delayed recognition of symptoms of acute coronary syndrome by both the patient and physician[20] - Variable knowledge and experience of healthcare teams, sometimes lacking pre-defined and clear roles and responsibilities[20] - Weak response capacity of emergency department professionals in terms of pre-hospital emergency service[20] - Inconsistently applied national evidence-based guidelines when available[20]	- Varied level and qualification of health services according to the schedule, such as specialized support, catheterization laboratory availability, inter-hospital transfer times and post-discharge follow-up[20] - Limited sharing of information between the public and private spheres[20] - Lack of standardization and interinstitutional protocols previously established at the regional level[20]			

The National Stroke Project			- Organization of a regional network for stroke assistance[16]
Training Program for non-cardiologists	Fear of starting thrombolytic therapy[17]		
Good Practices in the Cardiology Program		- Implementation of continuing education initiatives based on care line monitoring data[21]	- Existence of an AMI care line implemented in the territory[21] - Integration of the Hospital into the care line[21] - Monitoring of the care line[21]

Source: prepared by the authors. Information extracted from the article. SAMU: Mobile Emergency Care Service

primary care's role as a care coordinator within SUS.[24] The concentration of studies in the southeastern region of Brazil, particularly in Minas Gerais and São Paulo, underscores the extensive implementation of the hospital component of RUE, along with focal points for AMI, stroke, and trauma in this macro-region.[25]

The BPC program has shown promising outcomes for RUE in CVD,[21,22] yet improvements are still needed, as noted in Passaglia et al.'s study.[21] This study highlighted that one of the seven acute coronary syndrome indicators fell below target (advice to quit smoking), along with two of the five heart failure indicators evaluated (ACEI or ARB and spironolactone at hospital discharge).[21,22]

The challenges identified in implementing these programs highlight the importance of training healthcare professionals, particularly in health education strategies, to overcome implementation hurdles. Moreover, the absence of studies employing implementation science methodologies underscores the need to integrate scientific evidence into RUE service practices.[26]

It is noteworthy that the primary focus of studies on RUE with a CVD emphasis revolves around health management, likely aiming to address governance vulnerabilities identified by Padilha et al.[27] In general, RUE needs progress to establish an effective service network. Regarding the implementation of programs, the importance of telemedicine in health care in RUE

for CVD was evident. Telemedicine is increasingly established as a tool to enhance care, facilitating clinical decisions for invasive treatments in patients with ST-segment elevation AMI[28] and enabling consultations between cardiologists at specialized centers and patients in remote areas.[29]

Another significant finding from the identified studies is the clinical management approach through care pathways, particularly for AMI and stroke, underscoring integrated care for patients. The evidence gathered[9-15,17-20] consistently correlates with the leading causes of morbidity and mortality in the country.[11] The concentration of studies and initiatives aims to enhance diagnosis, therapeutic approaches, and patient management in cases of AMI. Implementing an integrated regional network to ensure swift reperfusion and employing evidence-based therapies is feasible and can enhance survival rates among patients with CVD.

The findings of this study (Central Illustration) are pertinent and robust, given the limited updates in RUE and CVD care over the past decade, both in research and institutional programs and strategies. However, it's important to note that while this study identified descriptions of reported effects in the literature, these do not necessarily reflect the interventions' effectiveness. This scoping review primarily maps relevant information without evaluating the methodological quality of

13

Uchimura et al.
Policies related to urgent and emergency care in cardiology

Int J Cardiovasc Sci. 2024; 37:e20240056
Original Article

the studies or the confidence level of the evidence. Furthermore, the lack of results does not mean the lack of effect of RUE PPs focusing on CVD.

In addition to this methodological consideration, reporting the limitations of the present review is necessary. Despite the broad and sensitive search, both for indexed studies and gray literature, the nature of the question may have led to the loss of potential studies since PPs are not always named or indexed in databases. Furthermore, this type of publication may be more restricted to internal technical documents from health departments or other institutions responsible for its implementation, requiring primary studies with the aim of identifying them. Another consideration is that during the selection process, conference abstracts containing actions potentially linked to PPs were identified. However, due to the lack of access to full-text articles, these studies were omitted to prevent biasing the results. Future reviews could assess whether this data has since been published in full subsequent to the completion of this study.

Finally, the findings highlight important research gaps, including the exploration of additional cardiovascular conditions and RUE components, such as the role of UBS in initial emergency care. Moreover, new cross-sectional studies are essential for a comprehensive approach to care management, focusing not only on access but also on quality, incorporating indicators related to impacts and costs.

Conclusion

The evidence gathered provides significant contributions to guide future policy development and improve decision-making in clinical management for cardiologists. However, substantial gaps in research persist, with few studies dedicated to describing and/or evaluating the implementation of programs and policies in RUE with a focus on CVD. Therefore, investigating other cardiovascular conditions is crucial. In conclusion, new cross-sectional studies that adopt a comprehensive approach to health care are essential.

Author Contributions

Conception and design of the research and critical revision of the manuscript for intellectual content: Uchimura LYT, Oliveira CF, Figueiró MF, Toth CPP, Lima CR, Vendramim P; acquisition of data: Uchimura LYT, Oliveira CF, Figueiró MF; analysis and interpretation of the data and writing of the manuscript: Uchimura LYT, Oliveira CF; obtaining financing: Toth CPP, Lima CR, Vendramim P.

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