

Integrated Regional Networks for ST-Segment–Elevation Myocardial Infarction Care in Developing Countries The Experience of Salvador, Bahia, Brazil

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Background—Regionalized integrated networks for ST-segment–elevation myocardial infarction (STEMI) care have been proposed as a step forward in overcoming real-world obstacles, but data are lacking on its performance in developing countries. We describe an integrated regional STEMI network in Salvador, Bahia, Brazil.

Methods and Results—The network was created in 2009. It was coordinated by the prehospital emergency medical service and encompassed the public emergency system (prehospital mobile units, community-based emergency units, general hospitals, and cardiology reference centers). The 12-lead ECGs are interpreted via telemedicine. This network operates as follows: The Telemedicine Center sends each ECG suggestive of STEMI to a Regional STEMI Alert Team, which, together with emergency medical services, offers support for thrombolysis or immediate transfer for primary percutaneous coronary intervention. In 14 months, there were 433 suspected victims, of which in 287 (76.5%) the STEMI could be confirmed (age, 62.1±12.5 years; 63.4% men). Most of them were self-transported. The median pain-to-admission time was 180 minutes (interquartile range, 90–473 minutes), and the median admission-to-ECG time was 159.5 minutes (interquartile range, 83.5–340 minutes). The median interval time between the ECG and the telemedicine report was 31 minutes (interquartile range, 21–44 minutes). For those who sought medical attention and had an ECG performed within 12 hours after symptoms onset (n=119), the reperfusion rate was 75.6% (34.4% by thrombolysis and 65.6% by primary percutaneous coronary intervention).

Conclusions—Regional STEMI networks may be feasible in developing countries. Preliminary results showed this network to be effective, achieving primary reperfusion rates comparable with those reported internationally despite the obstacles faced. (*Circ Cardiovasc Qual Outcomes*. 2013;6:9-17.)

Key Words: acute myocardial infarction ■ regional health ■ planning ■ telemedicine ■ reperfusion ■ population

Cardiovascular diseases, especially acute myocardial infarction (AMI), are the world's leading cause of death and disability.¹ According to the Information Technology Department of the Brazilian Public Health Care System, diseases of the circulatory system are responsible for about one third of deaths in Brazil.²

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In the real world, there are limiting factors for optimizing the management of ST-segment–elevation myocardial infarction (STEMI) according to recommendations from major national and international guidelines.³⁻⁵ In fact, about one third of patients eligible for primary reperfusion therapy do not receive the treatment.⁶ It has been proposed that the creation of specific regionalized integrated networks for STEMI may be a step forward in perfecting AMI treatment.⁷⁻¹⁷ The purpose of such networks would be to increase the rates of reperfusion therapy, to maintain

the lowest possible door-to-balloon and door-to-needle times, and ultimately to reduce associated morbidity and mortality.

The demonstration of benefits associated with these networks is consistent,¹⁸⁻²³ but the literature does not report on the formation of such networks in Brazil or Latin America. This is a significant gap in information, given that 80% of deaths and disability-adjusted life-years from cardiovascular diseases occur in low- and medium-income countries. The populations of these countries are more exposed to risk factors and have less access to preventive and equitable healthcare systems. In addition, cardiovascular diseases are known to contribute to an increase in poverty.²⁴

This article describes the development and operation of the Integrated Regional STEMI Network in Salvador, Bahia, Brazil, and defines its basic components. Moreover, we present a preliminary STEMI registry, including patients' demographics, clinical, interval times, and primary reperfusion

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WHAT IS KNOWN

- Optimal management of ST-segment–elevation myocardial infarction (STEMI) should be based on regional networks for STEMI, integrating different level health units and supported by an efficient pre-hospital emergency medical service.
- Such networks have proved to be a step forward in overcoming real-world obstacles, reducing treatment delays, and increasing the proportion of patients benefiting from reperfusion.
- The literature does not report on the formation of similar networks in developing countries despite the fact that 80% of deaths and disability-adjusted life-years from cardiovascular diseases occur.

WHAT THE STUDY ADDS

- Our results showed a regional network to be effective in achieving primary reperfusion rates that were comparable to those reported internationally, supporting the feasibility of developing regional STEMI networks in developing countries.
- A significant proportion of STEMI patients (about half in this study) initially present in community-based emergency units, which are usually under-represented in large clinical trials and most registries.
- Regional STEMI networks should consider local contexts and value strategies such as telemedicine to overcome geopolitical and urban/rural mobility difficulties.

characteristics, and discuss obstacles faced in the implementation, operation, and future improvement of this network.

Methods

The network described here was implemented in Salvador, the capital of the northeastern state of Bahia. The municipality of Salvador is home to >2.5 million residents, predominantly black and miscegenated people. It has a population density of 3859.35 people per 1km². Bahia has a Human Development Index of 0.805, gross domestic product per capita of \$10 061.42 BRL, and a Gini coefficient of 0.49.^{25,26}

Figure 1 shows a map of Salvador with the geographical distribution of health units involved in this STEMI network, all of which belong to the Brazilian public health system, the Unified Health System (*Sistema Único de Saúde* [SUS]), which is financed by federal, state, and municipal resources. There were 14 community-based emergency units, 7 general hospitals with emergency departments, and 2 cardiology reference centers with catheterization laboratories. The network also included the mobile units of the public health system prehospital emergency medical service (EMS). By 2009, the density of the public EMS service in this area was 1.64 mobile units per 100 000 residents and 0.32 advanced mobile units per 100 000 residents. The 12-lead ECGs performed in this public emergency care system are interpreted by cardiologists at a telemedicine center contracted by the state government for more than a decade.

According to the National Health Database,² in 2008, the year before the creation of this STEMI network, there were 582 hospital admissions for AMI in Salvador and 63 resulting in-hospital deaths. The total number of deaths, including those patients who never make it to the hospital, was 704 in that year. Under reporting is a major problem in this National Health Database, and there are no updated epidemiological data on STEMI in Salvador. Until 2009, according to unpublished data, the use of thrombolytic agents in public emergency units was very uncommon, and there was a very low volume of primary percutaneous coronary intervention in public catheterization laboratories.

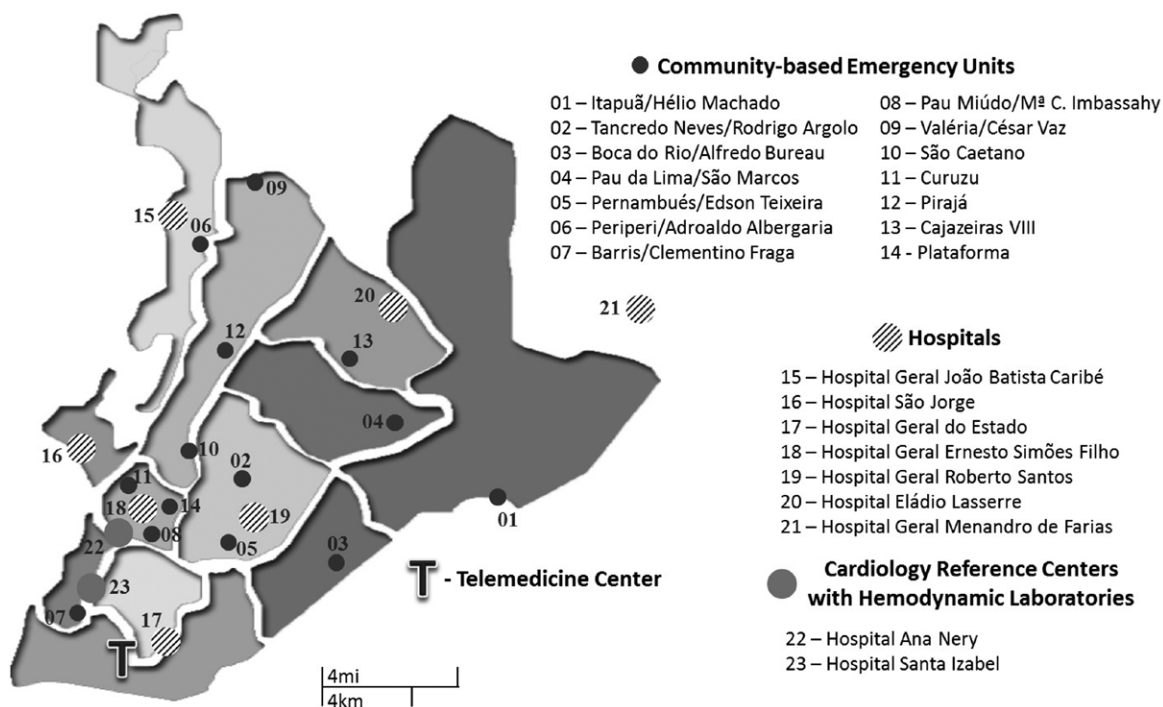


Figure 1. Geographic distribution of public healthcare facilities included in the Integrated Regional STEMI (ST-Segment–Elevation Myocardial Infarction) Network of Salvador, Bahia, Brazil.

On the basis of this data and through an EMS initiative supported by the contracted telemedicine center, the Integrated Regional STEMI Network was created on July 14, 2009.

Description of the Integrated Regional STEMI Network of Salvador, Bahia

The Integrated Regional STEMI Network of Salvador, Bahia has the following basic components:

EMS – This institution is responsible for overall coordination and initiative, integrating the network components at a central/municipal level. It is financed by the Unified Health System.

Health units – This category includes community-based emergency units and general hospitals with emergency departments, as well as prehospital ambulance units, all of them belonging to the Brazilian public health system. These units function as the port of entry, receiving walk-in patients who would eventually be managed through the network. The implementation of the network did not directly interfere with the routine functioning of these units.

Telemedicine center – A unit with an on-duty cardiologist (24 hours per day, 07 days per week) is responsible for collecting ECG tracings from health units and sending the respective reports back to the health units of origin. These are Web-based centers. ECG technicians in the health units are employees of their own units, trained by technical staff of the telemedicine center. Each ECG suggestive of STEMI is also sent, in parallel, to the Regional STEMI Alert Team by e-mail and short message service. This is a private organization contracted by the state government for more than a decade.

Regional STEMI Alert Team – This team for active search is composed of 7 medical students from the Federal University of Bahia who are under constant supervision by a cardiologist allocated specifically for this function. Each student is responsible for the occurrences of 1 day of the week, telephoning the patient's health unit and serving as a communication link with the EMS regulation center and hemodynamic laboratories. This team and the active search were incorporated into the STEMI network as a result of heterogeneity in knowledge and expertise of medical teams in the emergency departments. In

addition, organization problems and emergency department crowding are known factors for treatment delays in STEMI. A scientific scholarship is offered by the telemedicine center (*Telemedicina da Bahia*) for each student. The cardiologist on call is paid by the EMS.

EMS regulation center – This center operates in accordance with the standards and recommendations of the National Policy for Urgency and Emergency Care. It is staffed by physicians, not necessarily cardiologists. In STEMI cases, the center operates under a protocol adapted specifically to the flowchart shown in Figure 2. Along with the medical staff from the patient's health unit, the regulation center decides on the proper conduct in each case. When necessary, this includes choosing, on a case-by-case basis, the primary reperfusion method: on-site thrombolysis or transfer to a cardiology reference center for primary percutaneous coronary intervention.

Cardiology reference centers with catheterization laboratories – These publicly or philanthropically administrated health centers are contracted to the Municipal Health Secretariat of Salvador and serve as specialized centers for STEMI victims. Hospital beds are available at all times for the STEMI network, and in select cases, a patient may be admitted directly to the catheterization laboratory for primary mechanical reperfusion. The farthest general health unit was 25 km away from a cardiology reference center.

Research group for recording and monitoring STEMI in Salvador, Bahia – This group was created in January 2011 for tracking STEMI patients through the Salvador Registry for STEMI (REgistro Soteropolitano de Infarto agudo do miocárdio com Supradesnivelamento do segment ST [RESISST]) in an ongoing study. The activities of this research group have been duly authorized by a research ethics committee.

Figure 2 outlines the network in the form of a flowchart.

In short, this Integrated Regional STEMI Network operates as follows: the telemedicine center sends each ECG suggestive of STEMI to the on-duty STEMI Alert Team through e-mail and short message service (SMS). The team performs an active search on behalf of the patient by telephoning his or her health unit of origin. If STEMI is confirmed and the patient is within 12 hours of symptom onset (primary reperfusion therapeutic window), the EMS moves under direction from the regulation center. The EMS offers support, if needed, to

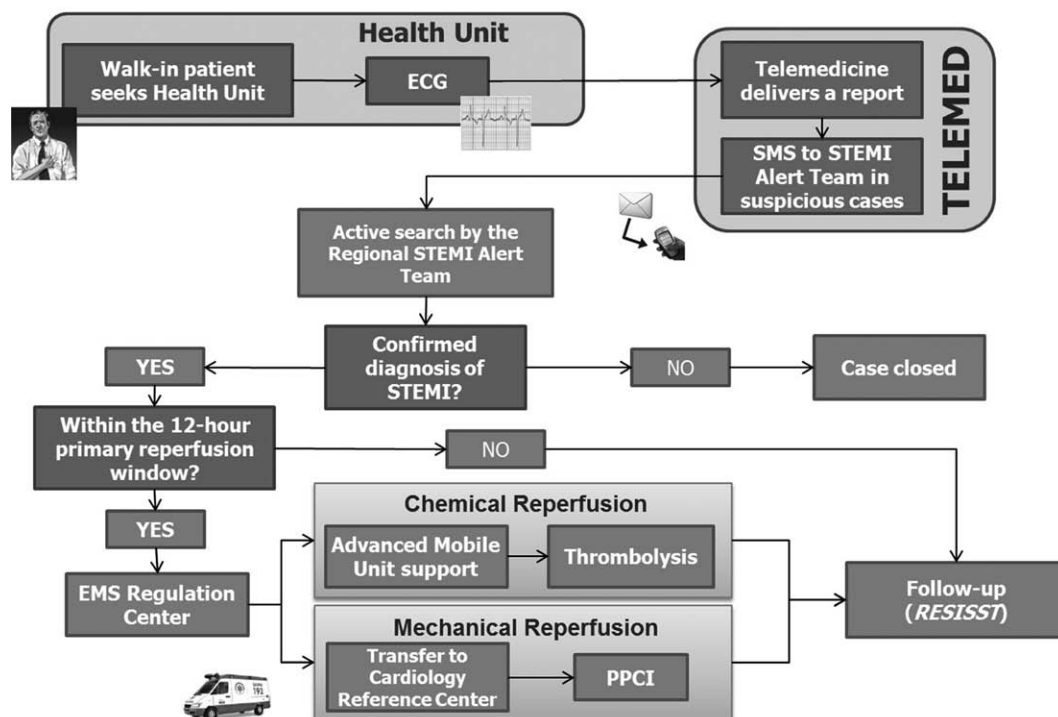


Figure 2. Flowchart of the Integrated Regional STEMI Network of Salvador, Bahia, Brazil. STEMI indicates ST-segment-elevation myocardial infarction; EMS, emergency medical service; PPCI, primary percutaneous coronary intervention; RESISST, REgistro Soteropolitano de Infarto agudo do miocárdio com Supradesnivelamento do segment ST; and SMS, short message service.

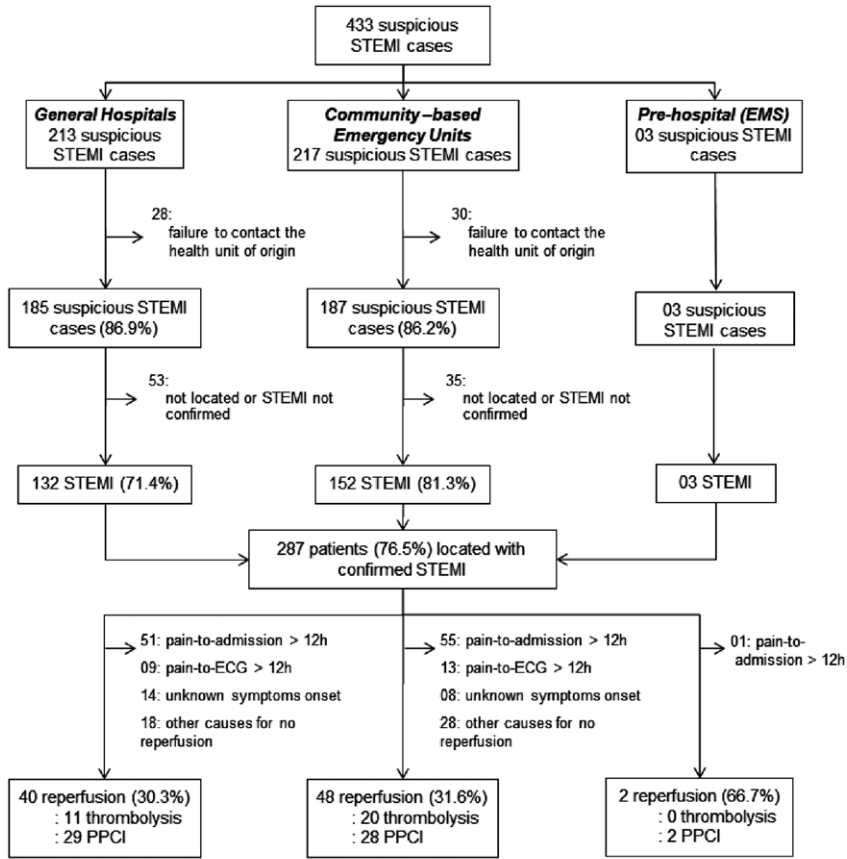


Figure 3. Patient origin and path in the Integrated Regional STEMI Network of Salvador, Bahia, Brazil. STEMI indicates ST-segment-elevation myocardial infarction; EMS, emergency medical service; and PPCI, primary percutaneous coronary intervention.

perform primary reperfusion, either by thrombolysis or by aiding in the immediate patient transfer, through an advanced mobile unit, to a cardiology reference center with an available catheterization laboratory to perform primary percutaneous coronary intervention. The decision on the type of reperfusion therapy to be used is made on a case-by-case basis, according to national and international STEMI guidelines.

Because all patients receive care through the Brazilian public health system (Unified Health System), the care of the population involved in this Regional STEMI Network is provided completely free.

All STEMI cases are monitored by RESISST through the Research Group for recording and monitoring STEMI in Salvador, Bahia. To obtain preliminary results, descriptive and analytic statistical analyses were done, through the use of a narrative approach when convenient and appropriate, given the preliminary nature of this article. Data are expressed as mean±SD or median (25th and 75th percentiles) for continuous variables and as percentages for categorical ones.

Results

The following results refer to the 14-month period between July 14, 2009, and September 8, 2010. Subsequent data, since 2011, will be given in greater detail after the creation and consolidation of the research group for RESISST.

There were 433 suspected STEMI patients referred to the Regional STEMI Alert Team. A total of 213 (49.2%) initially presented to general hospitals and 217 (50.1%) to community-based emergency units. The majority of them were self-transported rather than arriving by ambulance. Among these, in 86.6%, telephone contact was achieved with the health unit in which the patient was admitted, and in 76.5% of cases, the patient was located and STEMI was confirmed (Figure 3). Figure 4 contains information with respect to the distribution of suspicious cases over the course of the 14 months. There was an average of 30.9 incidents per month.

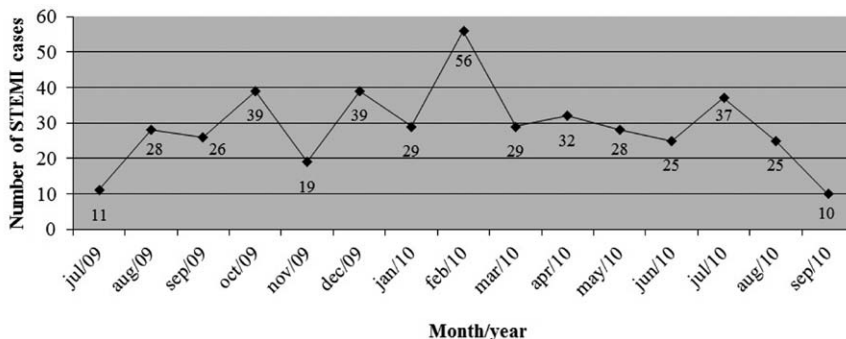


Figure 4. Distribution of suspicious ST-segment-elevation myocardial infarction (STEMI) cases by month and year (n=433) in the Integrated Regional STEMI Network of Salvador, Bahia, Brazil.

Table 1. Characteristics of STEMI Patients in the Integrated Regional STEMI Network of Salvador, Bahia, Brazil (n=287)

Characteristics	n (%)
Age (mean±SD), y	62.1 (±12.5)
≥75 y	43 (15.0)
Male sex	182 (63.4)
Heart rate (mean±SD), bpm	77.9 (±17.7)
≥100 bpm	39 (13.6)
STEMI wall	
Anterior	218 (56.8)
Inferior	137 (35.7)
Typical chest pain	177 (84.3)
Comorbidities	
Hypertension	193 (73.7)
Diabetes mellitus	97 (37.5)
Previous AMI	51 (21.5)
Pain-to-admission time, median (IQR), min	180.0 (90.0 – 473.0)
Admission <12 h since symptom onset	138 (56.6)
Admission-to-ECG time, median (IQR), min	159.5 (83.5 – 340.0)
Completion of ECG <12 h since symptom onset	119 (49.0)

STEMI indicates ST-segment-elevation myocardial infarction; AMI, acute myocardial infarction; and IQR, interquartile range.

As shown in Figure 3, in 23.5% of the 433 suspicious cases, contact attempts with the health unit of origin were not successful, the patient was not located, or STEMI was not confirmed. The following results refer to the 287 patients in whom STEMI was confirmed. The mean age was 62.1±12.5 years; 41.6% were elderly (≥65 years); and 63.4% were men. The diagnostic ECG showed an average heart rate of 77.9 bpm, anterior wall STEMI in 56.8% of cases, and inferior wall STEMI in 35.7%. About 15% of cases showed no typical chest pain, and there was a high prevalence of previous comorbidities (Table 1).

The median pain-to-admission time was 180 minutes (interquartile range, 90.0–473.0 minutes), and in 43.4%, the patient sought medical attention >12 hours after symptom onset. As shown in Figure 5, an imbalance was observed between the health unit admission time and the ECG completion time. Although 47.2% of all health unit admissions occurred between 10 PM and 10 AM, 28.6% of ECGs were performed in this interval. The median admission-to-ECG time was 159.5 minutes (interquartile range, 83.5–340.0 minutes), and 7.6% of patients surpassed the 12-hour primary reperfusion window because of ECG delay. The median interval between the time the ECG was performed by the health unit

and the e-mail/short message service report was sent from the telemedicine center to the health unit of origin and the Regional STEMI Alert Team was 31 minutes (interquartile range, 21–44 minutes).

In other words, the STEMI network was notified within the therapeutic window in only half of STEMI cases in which primary reperfusion could be offered and acute-phase management optimized. Considering only those patients who underwent an ECG with <12 hours since symptom onset (n=119), the STEMI network described in this study was able to offer primary reperfusion to 90 patients (75.6%). Of these, 31 (34.4%) underwent chemical reperfusion (thrombolysis with tenecteplase) and 59 (65.6%) had mechanical reperfusion (primary percutaneous coronary intervention; Table 2).

Discussion

Reports of factors that limit the transference of strategies and results from controlled, clinical trials to the real world are not uncommon. In the context of STEMI care, one can cite the following factors: the time lapse between the onset of symptoms and seeking medical attention; timely completion and interpretation of an ECG; difficulties for diagnostic confirmation by undertrained physicians; adverse events from intravenous infusion of thrombolytic drugs, especially in nonhospital environments; time required to transfer patients with contraindications to thrombolysis or who are nonresponsive to thrombolysis to reference centers with a catheterization laboratory; and limited access to these centers 7 days per week, 24 hours per day.²⁷

The above-mentioned problems are some of the limiting factors that together make up the rationale for STEMI care regionalization through integrated networks. Experiences implementing such networks have already been described in several locations such as North America and Europe, dating back a decade.^{10,28–34} In all, there invariably was a demonstrated benefit in this regional approach to STEMI, although still measured by substitute outcomes such as increased rates of primary reperfusion and reduction of door-to-balloon and door-to-needle times.

There is no question about whether it would be beneficial to regionalize attention to AMI. The discussion at present is focused on the type of reperfusion to be prioritized in each subgroup of patients and how to implement it in each regional context.^{18–23} Although some networks prioritize interhospital transfers to reference centers with a catheterization laboratory for primary percutaneous coronary intervention (following the hub-and-spoke concept), others such as the Integrated

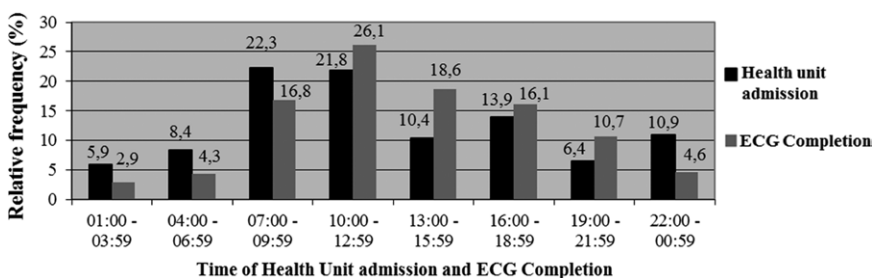


Figure 5. Time of health unit admission and ECG completion (n=287) for the ST-segment-elevation myocardial infarction (STEMI) cases in the Integrated Regional STEMI Network of Salvador, Bahia, Brazil.

Table 2. Primary Reperfusion in STEMI Patients Who Were Admitted and Had an ECG Performed <12 Hours Since Symptoms Onset (n=119)

Without primary reperfusion	29 (24.4)
With primary reperfusion	90 (75.6)
Thrombolysis	31 (34.4)
Primary angioplasty	59 (65.6)

*Data are presented as n (%) unless otherwise specified.
STEMI indicates ST-segment–elevation myocardial infarction.

Regional STEMI Network of Salvador, Bahia use a combination of chemical and mechanical reperfusion methods.

The North American and European networks, as well as this network developed in Salvador, Bahia, pursue the following core elements: performance of an ECG in the prehospital environment when possible; standardized institutional protocols previously established at the regional level; autonomy of emergency physicians to activate the network; leadership and regulation by a recognized agency that promotes interdisciplinary and interagency collaboration; and ultimately, integration of different levels of the health system—from the prehospital level to tertiary services.^{5,6,20,33}

There are 2 components of the Integrated Regional STEMI Network of Salvador, Bahia that are particularly noteworthy because they are not commonly used by the previously cited networks in other countries: telemedicine and a Regional STEMI Alert Team. The 12-lead ECG transmitted through telemedicine has the same standard of quality as the one interpreted at the site itself^{35,36} and is a Class IIa recommendation for prehospital units in the American Heart Association guidelines.⁴ In developing countries, telemedicine is increasingly relevant because of geopolitical difficulties such as the greater shortage of specialists (cardiologists) available full time for the interpretation of an ECG and poorer urban and rural mobility. In Salvador's network, a telemedicine center with cardiologists on duty 24 hours 7 days a week is responsible for the public emergency unit ECG interpretations and for the activation (through short message service and e-mail) of a Regional STEMI Alert Team. This alert team serves as the principal communication link between the health unit where the STEMI patient was admitted, the EMS regulation center, and the cardiology reference centers with catheterization laboratories. Among the benefits of having an alert team are the specific continuous training in STEMI management, the

support given to the attending physician through direct contact with the telemedicine cardiologist and the head of the EMS regulation center, and a global view of the health system with better management of available resources. This STEMI Alert Team much like cardiac arrest alert teams in hospitals that are available for cardiopulmonary resuscitation but at a regional level and responding to STEMI cases.

The gold-standard method for evaluating the effectiveness of the network created in Salvador would be to compare the primary reperfusion rates before and after its implementation. This analysis is limited by the absence of previous records on STEMI primary reperfusion in this city. However, the findings of a reperfusion rate of 65.2% for those patients admitted within 12 hours of symptom onset and 75.6% for those in whom an ECG was also performed (ie, activation of the network and the alert team) within the therapeutic window do not differ greatly from the rates reported in major international records. For example, the Global Registry of Acute Coronary Events³⁷ reports a primary reperfusion rate for those admitted within the 12-hour therapeutic window of 70%; the Euro Heart Survey on Acute Coronary Syndromes I and II^{38,39} report this rate to be about 60% and 70%, respectively; and the French registry of acute STEMI or non-STEMI⁴⁰ showed a rate of 64%. Other records in different North American and European countries present rates of primary reperfusion generally ranging from 40% to 90%.^{41–44}

The development of regional STEMI care networks is not free of obstacles. Table 3 presents a summary of the difficulties faced by the Integrated Regional STEMI Network of Salvador, Bahia, many of which are common among other similar initiatives mentioned above.

The preliminary results described indicate that about half of STEMI patients initially present in emergency unit characterized community-based emergency units. Considering the high mortality rate in the acute phase of this disease and the acknowledged difficulty in transferring these patients to tertiary services, it is possible to infer that this population lacks representation in large clinical trials and registries. These reports usually only include patients admitted in cardiology reference centers or intensive care units.

As for the chronology of events, there was an average incidence of 20 confirmed STEMI cases per month in Salvador. This number may be greater in reality because of noninclusion of private services in this network and sudden deaths that occurred at home. It is estimated that around 50% of

Table 3. Obstacles Faced by the Integrated Regional STEMI Network of Salvador, Bahia, Brazil

Infrastructure	Professional Training and Population Health Education	Management and Coordination of the Health System
Low level of health system informatization with a lack of technology for specific records	Delay in patient's recognition of ACS symptoms	Limited information sharing between public and private spheres
Varied level and capacity of health services according to schedule such as expert support, availability of catheterization laboratory, interhospital transfer times, and postdischarge follow-up	Variable knowledge and expertise of medical teams, sometimes with no clear predefined roles and responsibilities	Lack of standardization and previously established interinstitutional protocols at a regional level
Insufficient availability of hospital beds in coronary care units/cardiology reference centers	Poor responsiveness of emergency department professionals in terms of prehospital EMS service	Inconsistently applied national evidence-based guidelines when available

STEMI indicates ST-segment–elevation myocardial infarction; ACS, acute coronary syndrome; and EMS, emergency medical service.

AMI deaths occur in the first hour.⁴⁵ The circadian variation of thrombotic events is well documented,^{46–48} usually reported as occurring in 2 peaks: in the early hours of the morning and the hours leading up to midnight. All emergency units of the network function 24 hours per day, but >70% of the ECGs were performed during the day (between 7 AM and 7 PM), and an imbalance was seen between the health unit admission time and the ECG completion time. The data presented in this study do not permit final conclusions but suggest that factors related to the services operation during the after-hours period may also play a role.

Compared with other reports, there is a high prevalence of comorbidities in this sample. The Acute Coronary Care Evaluation of Practice Registry⁴⁹ in Brazil included 2301 acute coronary syndromes through September 2011, among which were 735 STEMI. Cardiology reference centers located in Salvador had contributed 116 acute coronary syndromes (the number of STEMI among these has not yet been published). The prevalence of previous diabetes mellitus and AMI in the Acute Coronary Care Evaluation of Practice Registry STEMI patients was 24.4% and 15.9%, respectively, compared with 37.5% and 21.5% in the network described here.

About 45% of patients sought medical attention at least 12 hours after symptom onset, which suggests a low level of health education in the general population. Of equal seriousness, 5% of STEMI patients were admitted before 12 hours after pain onset but exceeded the therapeutic window because of ECG completion delay. The optimal recommended interval between unit admission and ECG completion is 10 minutes.⁴ The following could explain this delay: the lack of infrastructure and human and material resources, the overflowing emergency departments, and inadequate health personnel training.

Despite the high effectiveness of the network for those cases admitted within the therapeutic window, a considerable percentage of patients (25%) admitted <12 hours after symptoms received no primary reperfusion. The causes for these lost opportunities have not been addressed and will be targets in future investigations. A substudy of Global Registry of Acute Coronary Events³⁷ and the Greek Hellenic Infarction Observation Study (HELIOS)⁵⁰ record demonstrates that the patients who did not receive primary reperfusion were those with worst health profiles: The patients were older and had more comorbidities, atypical pain, and a higher Killip class.

Regarding the description and evaluation of the Integrated Regional STEMI Network of Salvador, Bahia, the main limitation of this study has already been mentioned: the lack of previous data for the local population. With regard to preliminary results, it should be noted that the primary objective of this study, in the period between the implementation of this network and the year 2010, was not to perform an STEMI clinical registry. Thus, not collecting numerous variables and the possible existence of bias limit the thorough interpretation of results. To document the incidence, clinical management, and outcomes of STEMI in Salvador, the Salvador Registry for STEMI (RESISST) was created at the end of 2010. The results of this registry for the year 2011 are being prepared for publication.

Conclusions

The Integrated Regional STEMI Network of Salvador, Bahia uses methods established in the literature by previous initiatives with similar scopes. At the same time, the network considers the local context and values strategies such as telemedicine, an alert team, and university cooperation. Our results suggest that this model may be feasible in developing countries. Preliminary results showed the network to be highly effective in relation to the primary reperfusion rates, which were comparable to those reported internationally despite the obstacles faced.

Still, delays were shown in patients seeking medical attention and in diagnosis, which may be reflections of the low level of the population health education in the Salvador area and inadequacies in healthcare and professional training.

The impact of this network on objective clinical outcomes and other matters may be better addressed through the clinical registry that is in progress, the Salvador Registry for STEMI (RESISST).

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Disclosures

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None.

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None.

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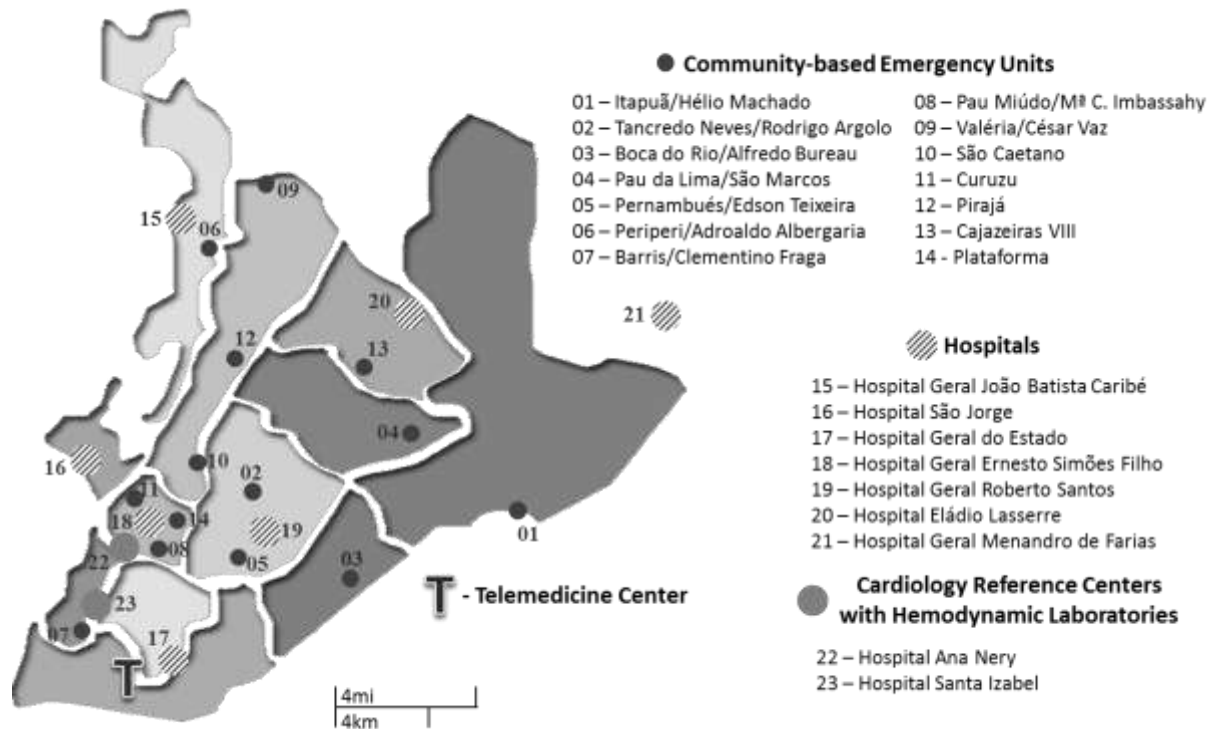


Figure 1

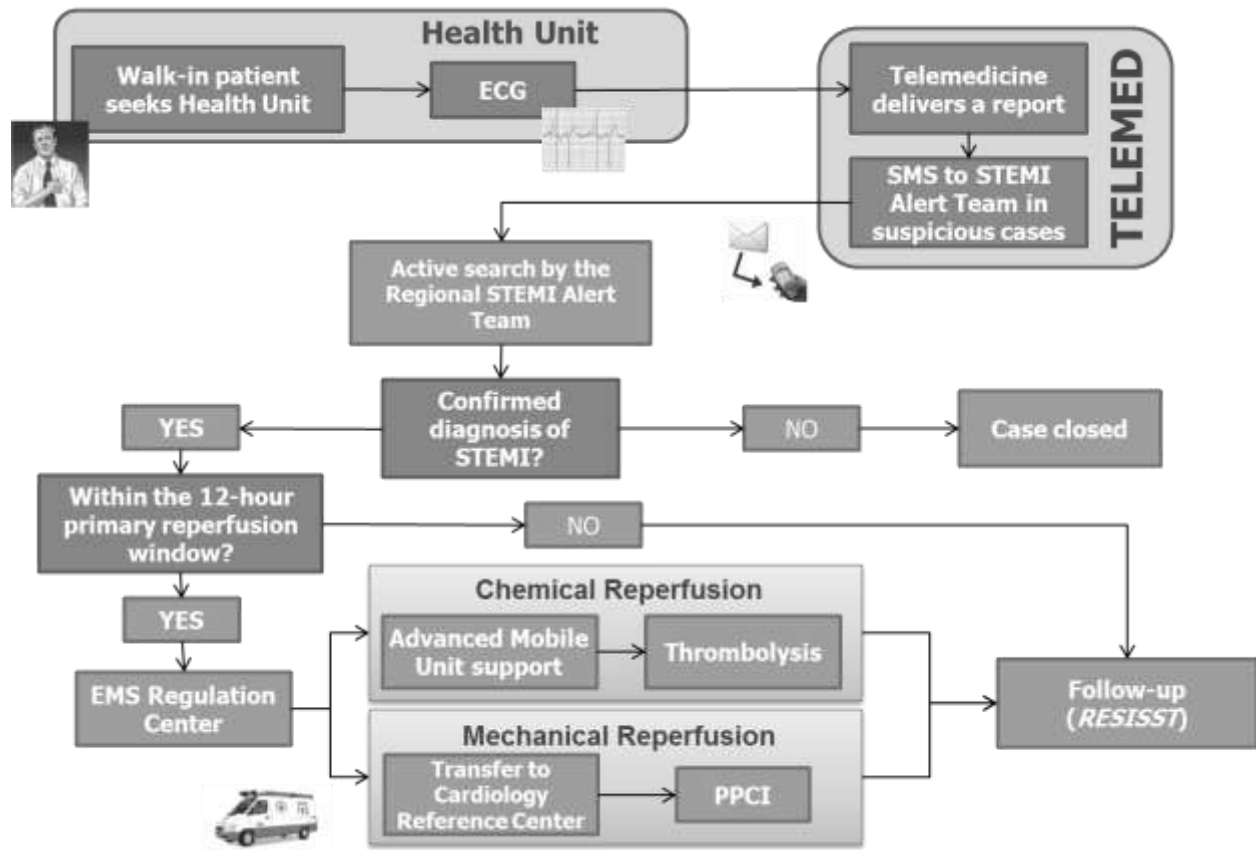


Figure 2

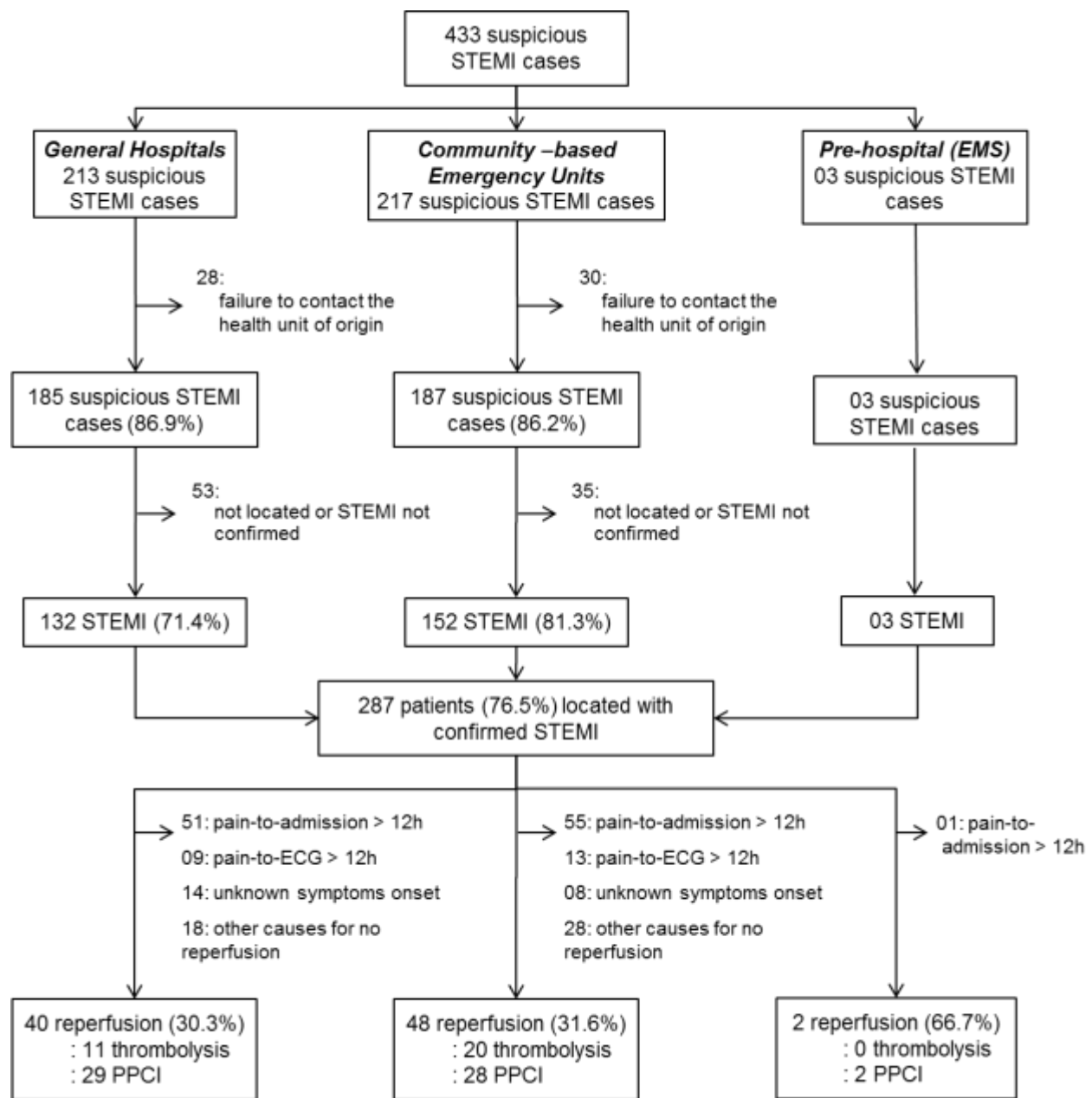
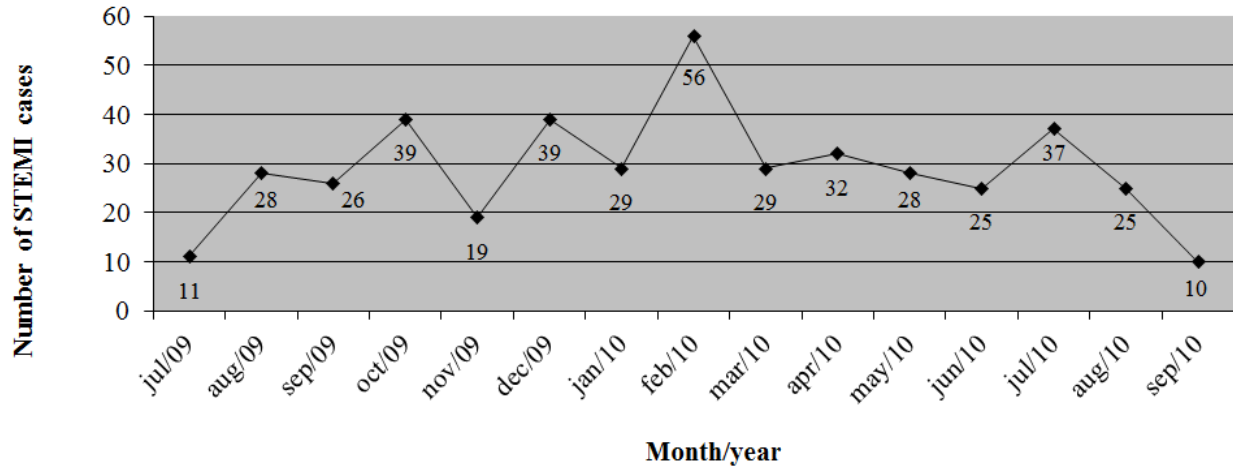
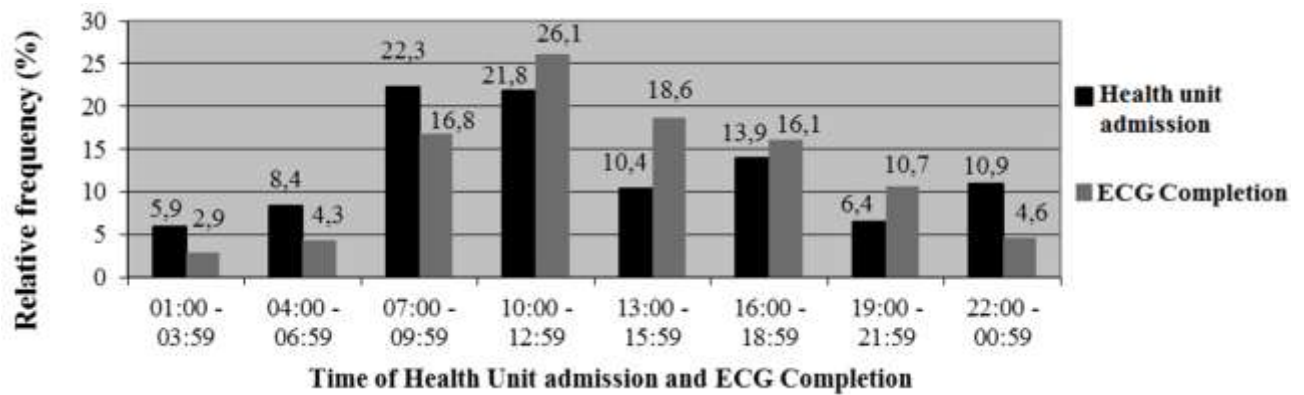


Figure 3



Graphic 1



Graphic 2

Figure and Graphic Legends

Figure 1. Geographic distribution of public healthcare facilities included in the Integrated Regional STEMI Network of Salvador-Bahia, Brazil

Figure 2. Flowchart of the Integrated Regional STEMI Network of Salvador-Bahia, Brazil

Figure 3. Patients origin and path in the Integrated Regional STEMI Network of Salvador-Bahia, Brazil

Graphic 1. Distribution of suspicious STEMI cases by month and year (n=433) in the Integrated Regional STEMI Network of Salvador-Bahia, Brazil

Graphic 2. Time of Health Unit admission and electrocardiogram completion (n=287) for the STEMI cases in the Integrated Regional STEMI Network of Salvador-Bahia, Brazil

SUPPLEMENTAL REFERENCES

None.

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