Awareness of the Rivers State Emergency Medical Services and Ambulance System (REMSAS) among traders in Mile 1 Market, Diobu, Port Harcourt, Nigeria

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ABSTRACT

Background: Emergency medical services (EMS) reduce deaths and disability from sudden illness and injury, but their benefit depends on whether the public knows that the service exists, how to reach it, and when to call. Market traders work in crowded, high-risk environments, yet little is known about their awareness of the Rivers State Emergency Medical Services and Ambulance System (REMSAS).

Objective: To assess the level of awareness of REMSAS among traders in Mile 1 Market, Diobu, Port Harcourt; to describe trader's perception of factors affecting awareness; and to describe trader's views on way of improving awareness of REMSAS.

Methods: A descriptive cross-sectional survey was conducted in 2025. A sample of 200 traders aged 20 years and above was determined with Taro Yamane's formula from a population of 400 and selected by systematic random sampling. Only traders who were willing to participate were included. Data were collected with a researcher-developed, face and content validated questionnaire and analyzed with frequencies and percentages.

Results: The results revealed that out of 200 questionnaires distributed, 180 were retrieved (response rate = 90.0%). Most traders (72.2%) agreed they had heard of REMSAS and 77.8% agreed that it should be called in an emergency, but only 50.0% stated they knew its emergency telephone numbers and 36.1% mentioned they had never used it or knew someone who had. The perceived level of awareness of REMSAS was moderately high with a mean of 0.674. The traders also stated that perceived factors affecting the awareness of REMSAS were not enough radio jingles (76.7%), lack of trust in government facilities (71.1%), and language and communication barriers (67.8%). The traders stated more radio jingles (83.3%), free REMSAS service (80.6%), and door-to-door campaigns (76.7%) are ways of improving awareness of REMSAS.

Conclusion: Most traders in Mile 1 Market are aware of the existence of REMSAS but not how to utilize their services. The traders suggested more radio jingles with emphasis on free service delivery and door-to-door campaigns as ways of improving awareness and of REMSAS which will further improve its utilization.

Keywords: Rivers state emergency medical services and ambulance system, awareness, market traders.

INTRODUCTION

In the developed countries, there is an established and functional emergency medical service (EMS), and they have an existing number for victims to call such as the 911 in the USA. EMS forms a critical link in the chain of

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survival, calling the ambulance for help is the first link in the chain of survival. Ambulance call-takers guide the caller to perform life-saving interventions on the patient before the paramedics arrive at the scene, therefore, their actions, decisions and communication between the caller and the ambulance unit are integral to saving the patient's life (Perera et al., 2023).

The AHA defines the "chain of survival" as the critical actions that must occur in rapid succession to maximize the chance of survival from cardiac arrest" and refers to it in its most recent CPR guidelines (Merchant, et al., 2020).

The "chain of survival" was first systematically described in an American Heart Association (AHA) statement in 1991 (Cummins et al., 1991). The AHA statement posited that "more people can survive sudden cardiac arrest when a particular sequence of events occurs as rapidly as possible". Over three decades later, the concept is still applicable. The sequence of "Early access", "Early CPR", "Early defibrillation", and "Early advanced care" is still being practiced. Early access in this statement refers to activation of the emergency response or in a lame man's understanding calling the ambulance service. Without this first link being achieved, others cannot follow.

EMS in much of sub-Saharan Africa remain under-developed, with gaps in funding, infrastructure, trained personnel, and coordination (Mould-Millman et al., 2017; Obermeyer et al., 2015).

In Nigeria, a further barrier is limited public knowledge of the services that do exist. A population survey of 1,177 residents of the Federal Capital Territory found that 57.8% were aware of EMS but only 8.6% had ever used them (Nto et al., 2024). Similar gaps between knowing and using emergency services have been reported in India, where 76.2% of respondents knew the national emergency number but about one in five had ever called an ambulance (Modi et al., 2018), and in other settings where the general public could not reliably identify emergency conditions and the services designed to respond to them (Saberian et al., 2023). Delaney et al. (2025) also mentioned in their study that one setback identified in the EMS in low- and middle-income countries (LMICs) was limited efforts to formalize and expand existing informal bystander care networks, this shows that it is important for everyone to have first aid knowledge so that bystanders can be of great assistance in medical emergencies while waiting for the medical team to arrive the scene.

Nigeria unlike some other low- and middle-income countries (LMICs) has an existing EMS system such as NEMSAS and REMSAS and some also run by private firms. A study by Sawe et al (2019) showed that some countries such as Tanzania did not have an existing EMS, this shows that Nigeria a few steps ahead of some countries. The personnels in-charge of the existing EMS are faced with the responsibility of improving awareness of EMS so as to improve its utilization.

Markets are a particularly important setting in which to study this problem. Mile 1 Market in Diobu, Port Harcourt is one of the most active commercial markets in Rivers State Nigeria with thousands of traders and customers daily. Medical emergencies, injuries and fires are likely due to crowding, heavy physical work, fire and electrical hazards and traffic congestion. There, bystanders and co-traders may be the first (and, frequently, the last) responders before an ambulance arrives, and their knowledge of how to call EMS is important.

The market in this study is the workplace of traders, and workplace health and safety is about sensibly managing risks to protect the workers and the business. The traders are the workers and need to manage their health which if not properly managed can affect their business. It is therefore necessary for this group of workers to be aware of the services to use in times of medical emergencies in their workplace and how to request for such services The level of awareness possessed by traders in Mile 1 market on appropriate medical service to use in times of medical emergencies which is the Rivers State Emergency Medical Services and Ambulance System (REMSAS) has not been reported.

The study therefore sought to find out the awareness of REMSAS among traders in Mile 1 Market, Diobu, Port Harcourt and the factors that affect the awareness as well as how to improve the awareness. The results will guide targeted communication by REMSAS, market associations and health authorities.

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LITERATURE REVIEW

REMSAS and Public Awareness

Rivers State Emergency Medical Services and Ambulance System (REMSAS) is state-run emergency medical response and ambulance department under the Rivers State Ministry of Health. It provides rapid pre-hospital care, emergency medical transport, and ambulance services. It also partners with the National Emergency Medical Service and Ambulance System (NEMSAS) and RIVCHPP (Rivers State Contributory Health Protection Programme) to advance Universal Health Coverage (UHC) and emergency readiness across communities in Rivers State In cases of emergency, the REMSAS numbers to call are: 09040222283 09040222285 09040222281. Emergency medical services systems consist of the organizations, individuals, facilities, and equipment whose participation is required to ensure timely and medically appropriate responses to requests for prehospital care and medical transportation. The system design determines how resources are structured operationally, financially, legally, and politically. System design affects virtually every aspect of how requests for services are handled. The design of the system should support the primary goals of providing the best clinical and service quality possible with available resources. The principles and elements of emergency medical services system design vary in some respects between environments, organizational settings, health care systems, community settings, and cultures. Because changes to the emergency medical services system design can have a profound effect on clinical outcomes, community satisfaction, and cost, it is vital for emergency medical services and community leaders to have a sound understanding of system design principles and elements (Gunderson., 2021).

Since EMS systems differ between countries, it is difficult to provide generic rules and approaches for EMS planning. Nevertheless, the common goal for all service providers is to offer medical assistance to patients with serious injuries or illnesses as quickly as possible.

Olaomi et al 2024 in their study mentioned that certain skills are needed in pre-hospital/community treatment, among which are knowledge of where to get help and how to access the help. Without public awareness of the number to call or of what constitutes an emergency, there will be poor utilization of the emergency medical service. Health education theory states that knowledge, social support and trust in services all impact health behavior (Glanz et al., 2015) and that trust in the health system affects health system utilization (Kruk et al., 2018). In situations where the emergency services is weak delays in calling for help are definitely established as contributors to preventable deaths, and outcomes vary depending on the organization of services and the location of use; therefore, the importance of building public knowledge of when and how to use the service is very vital and will go a long way in preventing certain deaths.

Factors Affecting Awareness

Poor communication, cost, cultural beliefs and confidence in the health care system have been consistently associated with emergency care awareness and use in Nigeria (Oreh et al, 2026). A study by Nto et al., 2024 revealed that the location of the individual affects their awareness of EMS. Alanazy et al., 2023 also supported that location affects awareness and utilization of EMS In another study, it was revealed that the proper knowledge regarding the appropriate use of EMS was significantly associated with the participant's level of education, academic field, job and income (Saberian et al., 2023). In this study, the individual's job as a trader was used to test the awareness of REMSAS, therefore, only traders were put to test. Other studies can test other occupations and their level of awareness of REMSAS. Olaomi et al., 2024 stated that the pre-hospital component is the weakest part of the healthcare system, they went further to state that communities should be engaged and trained in early access to the emergency care system, they also suggested that more efforts should be made by all states to reduce emergency-related morbidity and mortality. Mould-Millman et al., 2017 in their study identified that only 19% of African countries had government financed EMS systems and only 26% had a toll-free public access telephone number, this shows that there is the need for the government to make available toll-free public telephone number as this will improve not just the awareness but also the utilization of the existing emergency medical service (EMS).

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In a study by Xirasagar et al., (2019) it was discovered that 75% of the respondents did not use the EMS because they were unaware of the importance of EMS use for good outcome. This shows there is an existing gap in awareness of the EMS.

In many LMICs, prehospital care is inconsistent and under-resourced within health systems, and there is the need for interventions so as to reduce mortality in these settings (Obermeyer et al., 2015).

Ways of Improving Awareness

Community-based training in first aid and emergency recognition, broadcast and social media messaging, working through trade associations and market leaders, and campaigns that provide information about the service and its availability (as it is usually free) have all been suggested (Akinreni., 2024; Glanz et al., 2015; Kironji et al., 2018).

Stefanov (2023) stated that there is need for safety briefings in warehouses. This supports the need for first aid and safety trainings among traders in markets.

METHOD

Study Design

A descriptive cross-sectional survey design was used. Descriptive designs observe and describe a phenomenon without manipulating it (Babbie, 2020), which suits an assessment of what traders know about REMSAS at one point in time.

Study Setting

The study was conducted in Mile 1 Market, Diobu, Port Harcourt, Rivers State, Nigeria. The market lies along Ikwerre Road within the Diobu commercial district, which also includes Mile 2 and Mile 3 markets. It has approximately 2,200 lock-up shops arranged in blocks, and its facilities include a fire station and a clinic offering basic health care. The market was rebuilt after a major fire in 2013, with construction running from August 2017 to February 2019. It sells foodstuffs, clothing, electronics, and household goods, and serves people from many ethnic backgrounds.

Population, Sample Size, and Sampling

The target population were traders operating a shop in clothing and household goods segments of Mile 1 Market. These two segments were selected because they were accessible and all occupied by traders and had a current register from the market unlike the other segments that had several shops which were not yet occupied therefore, the findings apply to these segments and not to the whole market.

The target population was 400 eligible traders operating in two segments of the Mile 1 Market. The sample size was calculated with Taro Yamane's formula (Yamane, 1967):

$n = N / (1 + N(e)^2)$

$= 400 / (1 + 400 \times 0.05^2)$

$=400 / (1 + 400 \times 0.025)$

$= 400 / (1 + 1)$

$= 400 / (2)$

$= 200$

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where n = sample size,

N = population, and

e = margin of error (0.05).

A sample size of 200 was derived.

Simple random sampling was used so that every eligible trader had an equal chance of selection and s**ystematic sampling was done where every second shop was picked to form the sample size.**

Eligibility Criteria

Inclusion criteria. Participants were included if they (a) were traders who operated a shop or stall in Mile 1 Market at the time of the study; (b) were aged 20 years or older; and (c) were present on the day of data collection.

Exclusion criteria. Individuals were excluded if they (a) were not traders in the market, for example customers, visitors, and other passers-by; (b) were younger than 20 years; or (c) were not present on the day of data collection. Participation was voluntary and respondents could decline any item.

Instrument

Data were collected with a researcher-developed questionnaire in two sections. Section A captured demographic characteristics (gender, age, marital status, religion, and educational level). Section B contained 15 dichotomous (Yes/No) items grouped under the three study objectives: level of awareness of REMSAS (5 items), factors affecting awareness (5 items), and ways of improving awareness (5 items).

Validity and Reliability

Face and content validity were established by two public health lecturers and one emergency physician whose corrections were incorporated in the instrument. Reliability was assessed using the test-retest method with 20 respondents from a comparable setting outside the study site who completed the questionnaire twice within two weeks, and a coefficient of 0.78 was derived using Pearson's product-moment correlation. Pilot respondents were not included in the study sample.

Data Collection

Each selected trader was visited at their shop. If the trader was absent, the shop was revisited one more time on a different day. A selected trader who declined, who remained unavailable after the revisit, or who returned an unusable questionnaire was classed as a non-respondent and was not replaced. Out of the 200 selected, 180 returned complete questionnaires (response rate 90.0%). For the 20 non-respondents, 7 declined, 8 were unavailable, and 5 returned incomplete forms.

Two research assistants were trained and briefed on the administration and retrieval of the questionnaire. Questionnaires were distributed to willing, eligible traders and collected on the spot after completion. Also, respondents who could not read were helped by an assistant who read the questions out loud to them and ticked their response. Data collection lasted for a period of 6 weeks.

Data Analysis

Responses were coded and summarized with frequencies and percentages and presented in tables, organized by research question.

Ethical Considerations

Participation was voluntary, and only traders who were willing to take part were included. A cover letter explained the purpose of the study and assured respondents of confidentiality. Respondents were told the purpose of the study and assured that their information would be kept confidential and used only for research. No names or other direct identifiers were collected.

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RESULTS

Out of the 200 questionnaires distributed, 180 were retrieved and analyzed, giving a response rate of 90.0%.

Demographic Data

Table 1 shows 98 (54.5%) of the respondents were male. The largest age group was 20 to 30 years (30.6%), 84 (46.7%) were married, majority were Christian 105 (58.3%), and 77 (42.8%) had tertiary education. Only 6.7% had no formal education.

Table 1: **Sociodemographic Characteristics of Respondents (N = 180)**

Variable	Category	n (%)
Gender	Male	98 (54.4)
	Female	82 (45.6)
Age (years)	20–30	55 (30.6)
	31–40	48 (26.7)
	41–50	42 (23.3)
	51 and above	35 (19.4)
Marital status	Single	66 (36.7)
	Married	84 (46.7)
	Divorced	18 (10.0)
	Widowed	12 (6.7)
Religion	Christianity	105 (58.3)
	Islam	60 (33.3)
	Traditional religion	15 (8.3)
Educational level	No formal education	12 (6.7)
	Primary	28 (15.6)
	Secondary	63 (35.0)
	Tertiary	77 (42.8)

Source: field survey, 2025

Table 2: **Level of Awareness of REMSAS Among Traders (N = 180)**

Item	Yes	No	Mean
	n (%)	n (%)	
Have you heard of the Rivers State Emergency Medical Service and Ambulance System?	130 (72.2)	50 (27.8)	0.722
Do you know you can call REMSAS on 090 4022 2281 or 090 4022 2283?	90 (50.0)	90 (50.0)	0.5
REMSAS is responsible for carrying and transporting patients	125 (69.4)	55 (30.6)	0.694
You should call REMSAS during an emergency	140 (77.8)	40 (22.2)	0.778
Have you or someone you know ever used REMSAS?	65 (36.1)	115 (63.9)	0.361
Average mean awareness:			**0.674**

Source: field survey, 2025

Table 2 shows that 72.2% of traders had heard of REMSAS, 69.4% correctly identified its role in transporting patients, and 77.8% agreed that it should be called during an emergency. However, only half (50.0%) knew its emergency numbers, and less than half (36.1%) had used it or knew someone who had. The average mean

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awareness of REMSAS among traders in Mile 1 market as shown in Table 2 is 0.674, this figure excludes the last question on utilization of REMSAS. This suggests a relatively good level of awareness of REMSAS among the traders.

Table 3: Trader's perception of factors affecting awareness of REMSAS (N = 180)

Item	Yes	No
	n (%)	n (%)
Not enough radio jingles	138 (76.7)	42 (23.3)
Cost and affordability of REMSAS services	110 (61.1)	70 (38.9)
Cultural and social beliefs	97 (53.9)	83 (46.1)
Language and communication barriers	122 (67.8)	58 (32.2)
Lack of trust in government facilities	128 (71.1)	52 (28.9)

Source: field survey, 2025

Table 3 shows that not enough radio jingles (76.7%) and lack of trust in government facilities (71.1%) were highly perceived factors affecting the awareness of REMSAS among traders, followed by language and communication barriers (67.8%) and cost and affordability concerns (61.1%). Cultural and social beliefs (53.9%) were only mentioned by about half of the traders.

Table 4: Trader's views on ways of improving awareness of REMSAS (N = 180)

Item	Yes	No
	n (%)	n (%)
There should be more radio jingles	150 (83.3)	30 (16.7)
There should be door-to-door campaigns	138 (76.7)	42 (23.3)
REMSAS services should be free	145 (80.6)	35 (19.4)
Sensitization programs should be organized among traders	120 (66.7)	60 (33.3)
First aid training should be organized among traders	132 (73.3)	48 (26.7)

Source: field survey, 2025

As shown in Table 4, 150(83.3%) of the traders recommend more radio jingles and 145(80.6%) stated that REMSAS services should be free. 138 (76.7%) of the traders recommended door-to-door campaigns, 132(73.3%) traders stated that first aid training should be organized among traders and 120(66.7%) traders mentioned the need for sensitization programs among traders as a way of improving awareness of REMSAS among traders.

DISCUSSION

This study assessed awareness of REMSAS among traders in Mile 1 Market, the factors that affect it, and ways to improve it. Awareness was moderately high with an average mean of 0.64. the results revealed that 72.2% of the traders had heard of REMSAS, which is higher than the 57.8% reported for residents of the Federal Capital Territory who had heard of NEMSAS, which is the existing government emergency medical service operational there (Nto et al., 2024), although the two studies differ in population and design and the figures are not directly comparable. Half of the traders were aware of the emergency numbers and fewer than half had utilized the service or knew someone who had.

Radio jingles were the most common association with awareness (76.7%) while more jingles was the most suggested way of improving awareness of REMSAS (83.3%). This aligns with the concept that community-level communication is an essential way to communicate health information to people (Glanz et al., 2015). The lack of trust in government facilities (71.1%) and language and communication barriers (67.8%) were also high,

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indicating the importance of the method and the sender of the messages as much as their frequency. There are also health education models that highlight the importance of trust, social support, and the fit between the message and the audience (Glanz et al., 2015). The fact that 61.1% linked awareness to cost concerns, alongside high support (80.6%) for a focus on the free service, indicates that traders might believe that ambulance care is too expensive. Perceptions of cost have been found to be an obstacle to care-seeking during an emergency in resource-poor contexts (Mould-Millman et al., 2017). This is typical of the moderate effect of cultural and social beliefs (53.9%), which has been reported by some traders to be more inclined towards the use of traditional remedies (Okunola & Nwaneri, 2019), but other factors in this sample that included trust, language, and cost were more prominent.

Traders agreed on door-to-door campaigns (76.7%), education and training (73.3%) and incentive and recognition program (66.7%). These community-based strategies align with recommendations for engagement and training at the community level to boost preparedness and service uptake (Akinreni, 2024; Glanz et al., 2015, Stefanov, 2023) and are feasible in a market where traders are associated and share a market building. They are also applicable in the context where ambulances can be stuck in the congestion and bystanders may need to intervene first, therefore, there's need for first aid training among the traders (Olaomi et al., 2024; Delaney et al., 2025).

CONCLUSION AND RECOMMENDATIONS

Traders in Mile 1 Market have a fairly high general awareness of REMSAS, but just a few know the emergency numbers. Not enough radio jingles, lack of trust in government facilities, and cost perceptions were the most perceived factors linked to awareness of REMSAS. Based on these findings, the study recommends:

1. REMSAS and the Rivers State Ministry of Health should expand radio jingles and market-based campaigns that repeat the emergency numbers clearly and consistently.

2. Door-to-door and in-market outreach should be conducted with trusted local influencers and market leaders to build credibility.

3. Publicity messages should state explicitly what the service covers and if it is free, to correct cost-related misconceptions.

4. Messages should be delivered in local languages and in culturally familiar formats to reduce communication and trust barriers.

5. REMSAS should organize first aid trainings among Trader unions and market associations to encourage participation.

6. Future research should use larger market samples, and inferential analysis to examine associations between traders' characteristics and awareness.

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APPENDIX I

Department of Paramedic Technician,

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P.M.B 5039 Rumueme,

Port Harcourt.

25th February, 2025.

Dear Respondents,

We are researchers from the above mentioned institution carrying out a study on "**Awareness of Rivers State Emergency Medical Services and Ambulance System among Traders in Mile one Market, Diobu, Port Harcourt".**

The purpose of this letter is to appeal to you for your assistance in providing information that will be relevant in carrying out the research work by answering the questions attached to this letter. Be rest assured that your information will be treated with utmost confidentiality.

Yours faithfully,

Researcher

APPENDIX II

QUESTIONNAIRE

Instruction: (*Please tick (√) the appropriate response in the boxes provided below)*

Section A: Demographic Information

1. Gender: Male ☐ Female ☐
2. Age: 20-30 ☐ 31-40 ☐ 41-50 ☐ 51and above ☐
3. Marital Status: Single ☐ Married ☐ Divorced ☐ Widowed ☐
4. Religion: Christianity ☐ Islamic ☐ Traditional Religion ☐
5. Educational Level: No formal education ☐ Primary ☐ Secondary ☐ Tiary ☐

SECTION B

Level of Awareness of REMSAS

S/N	Options	Response	
		Yes	No
1	Have you heard of Rivers State Emergency Medical Service and Ambulance System?		
2	Do you know these REMSAS numbers 090 4022 2281, 090 4022 2283?		

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3	Are you aware that REMSAS are responsible for carrying and transporting patients?		
4	Do you know you should call REMSAS during a medical emergency?		
5	Have you or someone you know ever used REMSAS?		

Perceived Factors affecting awareness of REMSAS among Traders

S/N	Options	Response	
		Yes	No
1	I perceive that radio jingles affects awareness of REMSAS among traders		
2	I also perceive that cost and affordability concerns affects awareness of REMSAS among traders		
3	I perceive that cultural and social beliefs affects awareness of REMSAS among traders		
4	I believe that language and communication barriers affect awareness of EMS among traders		
5	I'm of the opinion that lack of trust in government facilities affects awareness of REMSAS among traders		

Ways of Improving Awareness of REMSAS among Traders

S/N	Options	Response	
		Yes	No
1	I feel there should be more radio jingles		
2	There should also be door to door campaign		
3	REMSAS should give free services		
4	Incentive programs should be organized among the traders		
5	Education and training on first aid should be organized among traders		