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"A Multi-faceted Approach Streamlining Emergency Management and Ambulance Services"

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ABSTRACT

In the face of escalating challenges in emergency healthcare services, achieving resilience has emerged as a critical objective. This research paper examines the potential of a location-based emergency ambulance booking system to bolster resilience. By embracing digitalization, sustainability, and sectoral transformation, this study addresses the urgent needs of the healthcare system. Through a comprehensive mixed-methods approach, including semi-structured interviews and a web-based survey, valuable insights are gathered from patients, hospitals, and healthcare service providers.

Leveraging geolocation technology, Ambu Finder identifies nearby hospitals with available ambulance services, enabling prompt responses and reduced emergency response times. Additionally, the application, developed using React Native for the mobile platform, offers registered users the convenience of uploading their medical reports, ensuring hospitals are wellprepared to handle critical situations.

This research sheds light on the transformative role of digitalization, sustainability, and sectoral transformation in enhancing resilience within emergency healthcare services. By emphasizing the integration of these three pillars and leveraging cutting-edge technologies such as cloud storage, the study underscores their pivotal significance in the successful implementation of the location-based emergency ambulance booking system. The findings provide crucial insights for healthcare stakeholders and offer recommendations for further research and practical implications, ultimately paving the way toward a more resilient healthcare system.

Ambulance diversion is a dangerous repercussion of emergency department (ED) crowding and can reflect fragmentation and a lack of coordination in designating optimal patient offload sites for prehospital providers.

The objective of this study was to evaluate whether proactive destination selection through the Regional Emergency Patient Access and Coordination (REPAC) program would enhance capacity and ED flow management. Ambulance diversion is a common phenomenon that is invoked in some EMS systems when an ED is perceived to have exceeded its capacity to care for new patients.

Institutions may also divert ambulances if they do not have the appropriate facilities, such as operating rooms, intensive care units, or the trained specialists for the specific patient population or injury incurred. Diversion has been invoked as a safety measure that improves the care both for patients in the overwhelmed ED and for those being diverted away.

However, ambulance diversion is also a reflection of the inability of receiving hospitals to manage fluctuations in demand, can result in deleterious outcomes for patients, and places strain on EMS systems in terms of their ability to deliver service to the population. Bypass routing for EMS crews, whereby providers must frequently travel longer distances to find a nondiverted ED, is also another concern.

Integration and coordination of both prehospital and receiving hospital systems into functional networks of care on a regional scale may result in the more efficient and rational provision of emergency services and may mitigate the effects of ED crowding on ambulance diversion. Regionalization within EMS care is a notion that seeks to manage the flow of patients in a manner that takes a broad, multicenter view of transport demand and connects it with receiving hospital supply so as to optimize resource utilization.

We hypothesized that optimizing the process of EMS patient allocation through a regionalized and real-time dashboard program would mitigate the access disparities and transport inefficiencies resulting from rising levels of ED crowding. Specifically, our objective was to evaluate whether proactive destination selection through a real-time, online system would enhance the ability of our region's hospitals to absorb the load of EMS transports as reflected through reduced diversion and sustained periods in a favorable receiving status.

Keywords: assessment matrix; decision support; emergency management; multi-level governance; pandemic

INTRODUCTION

Significance of Emergency Management and Ambulance Services

Prompt and effective emergency management and ambulance services are fundamental pillars of a healthy and secure society. During critical medical emergencies, such as heart attacks, strokes, or accidents, timely intervention can significantly improve patient outcomes and even save lives. Studies by and demonstrate that a delay of just a few minutes in receiving medical care can drastically increase mortality rates and morbidity.

Furthermore, urbanization and population growth contribute to a rise in emergencies. Research by highlights the correlation between densely populated areas and an increased volume of emergency calls. This surge in demand strains existing emergency response systems, making streamlined operations even more crucial.

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Challenges in Emergency Management and Ambulance Services

Despite their undeniable importance, emergency management and ambulance services face numerous challenges that impede their effectiveness. Common issues include:

- Slow Response Times: Traffic congestion, inefficient dispatch systems, and a lack of resources can significantly delay ambulance arrival times. A study by found that response times in urban areas often exceed recommended targets, leading to poorer patient outcomes.

- Inadequate Training and Coordination: Disjointed training programs and a lack of clear communication protocols among emergency responders (police, fire, ambulance) can hinder coordinated response efforts. Research by [Author5, Year] suggests that inter-agency collaboration and standardized training can significantly improve emergency response efficiency.

- Unequal Access to Services: Residents in underserved areas often face longer wait times or limited access to ambulance services altogether. A study by revealed disparities in ambulance response times between high-income and low-income neighborhoods.

These challenges highlight the need for innovative solutions to optimize emergency management and ambulance services.

This thesis proposes a multi-faceted approach to streamline emergency management and ambulance services. This approach will leverage technological advancements, improved training and collaboration, and public awareness initiatives to achieve faster response times, enhanced coordination, and equitable access to emergency care.

REVIEW OF LITERATURE

- **Fernanda Kempner-Moreira , Alessandro Margherita**

GUTAI Matrix provides a practical tool that can support emergency governance based on a multi-criteria analysis of the emergency, using the following criteria: gravity, urgency, trend, amplitude, and impact. The continuous acquisition of rich and reliable information is essential to health surveillance; hence, the information architecture that the GUTAI Matrix is based on comprises multiple government and healthcare information systems.
These systems are integrated in order to provide a holistic assessment of the health system's ability to absorb and recover from the outbreak. Integrating resilience-based ideas into disease control and prevention can prompt governments to make more proactive and comprehensive decisions in order to protect the health of communities.

The approach and the tool presented in this article represent an attempt to give health managers and policy makers a tool that (if validated by the central government may provide a way to standardize information collection and processing; moreover, it provides a set of proper response guidelines. The systems-based approach to analysis can support the development of decisions and control tools for policymakers in pandemic scenarios, and the assessment method can be adopted for use in other emergency management scenarios and contexts. Systems analysis and systems-based strategies

have great potential for addressing critical global issues, and they can Also guide policy decisions by drawing on innovative methodologies, models, and tools.

This study also contributes to the investigation ofthe importance of cross-agency networking and information accessibility, which can affect the efficiency of emergency collaborations.

01 May 2021

- **David Olave-Rojas, Stefan Nickel, Stefan Nickel •Institutions**
  Karlsruhe Institute of Technology

The use of hybrid simulation and machine learning in modeling a pre-hospital emergency medical service, aiming to improve response times and resource allocation.
In this operative context, a challenge is the definition of proper real-time dispatching, routing and redeployment policies (DRRP) in such a way to maximize the number of emergency requests served within a time threshold, and to minimize the waiting times

- **David Olave-Rojas , Stefan Nickel , Stefan Nickel**
  Karlsruhe Institute of Technology

Paper focuses on optimizing ambulance station locations using mathematical programming models .
It compares a bi-criteria mathematical programming model with a p-median model and a hierarchical pq-median model .
The study aims to improve EMS performance by relocating stations based on response time objectives .

Computer simulation is used to evaluate solutions, with a focus on reducing average response time and increasing the number of calls responded to within specific time limits
The model was verified using techniques such as animation to visualize vehicle movements and validate optimization models.

- **31 May 2017**

Wang Jun

Medical management system with ambulance emergency dispatch, comprising an acquisition unit, a storage unit, a control unit and a mobile terminal unit; the output end of the acquisition unit is electrically connected with the input end of the storage unit, the acquisition unit comprises a hospital department information acquisition module (1) and a hospital ambulance information acquisition module (2), the storage unit comprises a hospital department information storage module (3) and a hospital ambulance information storage module (4), the control unit comprises a plurality of first control modules (5), the first control modules (5) are electrically connected with a road condition feedback module (6), a first positioning module (7) and a human-machine operation module (8) are arranged in the mobile terminal unit, and the output ends of the first positioning module (7) and human-machine operation module (8) are electrically connected to the first control modules. The system facilitates efficient ambulance dispatch by calling the hospital that can respond in the shortest time with available ambulances.

- **01 Jan 2013**

Zied Jemai, Lina Aboueljinane, Evren Sahin

Emergency Ambulance Deployment in Val-de-Marne Department A Simulation-based Iterative Approach Abstract:

The French Emergency Medical services, known as SAMU, are public safety systems responsible for the coordination of
pre-hospital care under emergency conditions throughout a given geographic region. The goal of such systems is to respond timely and adequately to population calls by providing first aid services and transferring patients, when needed, to the appropriate care facility. In this paper, we propose a multi-period version of the Maximum Expected Covering Location Problem applied to the case of the SAMU 94 responsible for the (France). The assumption that the busy fractions are identical for all demand points is relaxed by adopting an iterative method to compute a priori estimates of these parameters in the model using an ARENA discrete-event simulation model of the SAMU 94. The solutions obtained from the mathematical model are then assessed by simulation regarding the time required to respond to an emergency call by getting to the patient location, known as response time, which is a critical aspect for the SAMU providers. Experimental results showed that the proposed method increased average percentage of most serious calls responded to within the target time of 15 minutes up to 15% compared to the current system performance.

- **01 Jan 2018**

Keith Townsend, Rebecca Loudoun, Adrian John Wilkinson

Improving People Management in Emergency Services.
For emergency services organisations, mental health problems are associated with increased sick leave deteriorated health and well-being (Berger et al., 2007) and increased employee turnover (Patterson, Jones, et al., 2010).

This study has aimed to better understand the organisational factors that affect paramedic and support staff experiences of work and employment, and the impact of these factors on a range of individual outcomes, particularly associated with psychological health and wellbeing. To achieve the aims of this project, we conducted 1216 surveys and 72 interviews with emergency services employees across Queensland, South Australia and the Northern Territory. Data analysis has directed attention to some key findings, which are expanded upon in this Summary Report, and supported by detailed statistical analysis in the Companion Report. The key findings are summarised as follows:-A provisional PTSD diagnosis can be made for 10% of Queensland and 8.5% of South Australian staff. An additional 6.6% and 4% of respondents in each state respectively were found to be close to a provisional diagnosis. Recent changes in the measurement instrument for PTSD has meant that many people who would previously had a provisional diagnosis are now excluded (see Appendix A for discussion). More symptoms of PTSD are reported by employees with longer tenure of employment. Those with more symptoms have higher intention to quit and poorer ability to do their work. Social support is a key factor in these findings, with those reporting greater support also less likely to have symptoms of PTSD. Anxiety is at very high levels among the workforce. Those with severe and extremely severe anxiety comprise around 40% of the sample in all jurisdictions. Fatigue remains a major problem for more than half of all staff in each jurisdiction, even when controlling for variables such as age, gender, dependents, tenure, work hours and shift length. Interviewees report persistent high fatigue across all geographical areas, affecting their ability to perform and desire to stay in the service for the long term. Around one in every five employees are seriously looking for another job.

Employees' intention to quit is higher when they view the human resource management (HRM) system as weak, and when they are regularly exposed to natural disasters and physical assault. This finding highlights the importance of building a strong HRM system where employees are clear about the behaviours that are expected – and rewarded – by the organisation. This point is reinforced by a significant relationship between HRM system strength and employee fatigue. The employee support systems in place in these organisations provide vital social and organisational support for employees. Both formal and informal colleague support are fundamental elements of the support systems.

- 03 Mar 2022

Caitlin Mary Wilson, Anne Howell, Gillian Janes, Jonathan Benn

Feedback in this context can relate to performance or patient outcomes, can come from a variety of sources and can be sought or imposed. Evidence from health services research and implementation science, suggests that feedback can change professional behavior, improve clinical outcomes and positively influence staff mental health.

The current study aimed to explore the experience of EMS professionals regarding current feedback provision and their views on how feedback impacts on patient care, patient safety and staff wellbeing.This qualitative study was conducted as part of a wider study of work-related wellbeing in EMS professionals. We used purposive sampling to select 24 frontline EMS professionals from one ambulance service in the United Kingdom and conducted semi-structured interviews.

The data was analyzed in iterative cycles of inductive and deductive reasoning using Abductive Thematic Network Analysis. The analysis was informed by psychological theory, as well as models from the wider feedback effectiveness and feedback-seeking behavior literature.

Participants viewed current feedback provision as inadequate and consistently expressed a desire for increased feedback. Reported types of prehospital feedback included patient outcome feedback, patient-experience feedback, peer-to-peer feedback, performance feedback, feedforward: on-scene advice, debriefing and investigations and coroners' reports. Participants raised concerns that inadequate feedback could negatively impact on patient safety by preventing learning from mistakes.

Enhancing feedback provision was thought to improve patient care and staff wellbeing by supporting personal and professional development.In line with previous research in this area, this study highlights EMS professionals' strong desire for feedback.

The study advances the literature by suggesting a typology of prehospital feedback and presenting a unique insight into the motives for feedback-seeking using psychological theory. A logic model for prehospital feedback interventions was developed to inform future research and development into prehospital feedback.

RESEARCH OBJECTIVES

- To evaluate the effectiveness of various technological solutions (e.g., GIS, automated dispatch systems) in improving ambulance response times and resource allocation.

- To assess the impact of standardized training and communication protocols on collaboration and coordination among emergency responders.

- To analyze the effectiveness of public education programs in promoting emergency preparedness and CPR/first-aid training.

- To develop a comprehensive model for streamlining emergency management and ambulance services, addressing the specific challenges identified in underserved areas.

1. Effectiveness of GIS for Dynamic Ambulance Routing:

Objective: Evaluate the effectiveness of real-time traffic data integrated with Geographic Information Systems (GIS) in optimizing ambulance routing and reducing response times.

2. Impact of Automated Dispatch Systems on Efficiency:

Objective: Analyze the impact of automated dispatch systems on efficiency compared to traditional manual dispatch methods, considering factors like call processing time and resource allocation accuracy.

3. Inter-agency Collaboration and Information Sharing:

Objective: Investigate the benefits and challenges of inter-agency collaboration (police, fire, ambulance) in emergency response, focusing on information sharing protocols and joint training exercises.

4. Public CPR/First-Aid Training and Bystander Intervention Rates:

Objective: Assess the correlation between public CPR/first-aid training programs and bystander intervention rates during emergencies, potentially improving patient outcomes.

5. Effectiveness of Mobile Apps for Emergency Preparedness:

Objective: Evaluate the effectiveness of mobile applications in promoting emergency preparedness among the public. This could include features like CPR instructions, locating emergency services, and reporting incidents.

6. Optimizing Ambulance Deployment Based on Historical Data:

Objective: Analyze historical emergency call data to identify patterns and optimize ambulance deployment strategies, ensuring resources are available in high-demand areas and during peak times.

7. Impact of Community Outreach Programs in Underserved Areas:

Objective: Assess the effectiveness of community outreach programs in educating residents of underserved areas about emergency services and promoting trust in the system.

8. Cost-Benefit Analysis of Alternative Ambulance Transportation:

Objective: Evaluate the cost-benefit analysis of utilizing alternative modes of transportation for ambulances, such as motorcycles in congested areas, compared to traditional vehicles.

9. Mental Health Considerations for Emergency Responders:

Objective: Explore the mental health challenges faced by emergency responders due to constant exposure to high-stress situations and investigate potential support programs.

10. Long-Term Sustainability of Funding for Streamlining Efforts:

Objective: Analyze sustainable funding models for maintaining streamlined emergency management systems, considering public-private partnerships, cost-saving measures, and resource allocation strategies.

RESEARCH METHODOLOGY

Sample Unit and Size:

The sample unit will include emergency management agencies, ambulance service providers, healthcare professionals, and relevant stakeholders.
The size of the sample will be determined based on the scope of the study and availability of resources, aiming for diversity across regions and organizational structures.

Region:

The study will be conducted in both urban and rural areas to capture the variations in emergency management and ambulance services.
Regions selected will represent diverse socio-economic backgrounds, healthcare infrastructures, and geographic landscapes.

Procedure:

Conduct comprehensive literature review to identify existing approaches, challenges, and gaps in emergency management and ambulance services.
Engage in qualitative interviews and focus group discussions with key stakeholders to understand their perspectives, challenges, and needs.
Utilize observational studies to assess current practices and identify areas for improvement.
Employ participatory workshops and collaborative sessions to involve stakeholders in co-designing and refining the proposed approach.

Data Collection Method:

Primary data will be collected through interviews, surveys, observations, and participatory workshops.
Secondary data will be gathered through literature review, reports, and relevant documents.

Questionnaire Design:

The questionnaire will be structured to gather insights on current practices, challenges faced, desired improvements, and specific needs of stakeholders.
Questions will be both open-ended and close-ended, allowing for in-depth qualitative analysis as well as quantitative assessment.

The research will provide a holistic view of emergency management and ambulance services, encompassing various dimensions such as organizational structure, resource allocation, technology integration, communication protocols, training programs, and community engagement.
It will emphasize the importance of collaboration among different stakeholders, the integration of advanced technologies, and the development of standardized protocols to ensure a seamless and effective emergency response system.

By adopting this comprehensive research methodology, the study aims to contribute valuable insights and practical recommendations for enhancing emergency management and ambulance services, ultimately improving the quality of healthcare delivery and saving lives.

DATA ANALYSIS AND INTERPRETATIONS

Data Collection:

- Response Time Data:

Pre- and post-implementation response time data collected from ambulance dispatch centers during specified time periods.
- response times for emergency calls made during weekdays from 8 am to 5 pm before and after the deployment of the integrated communication system.

- Documentation of Integrated Communication System:

-Date of deployment of the integrated communication system.
Any associated changes in procedures, such as updated protocols for dispatchers and emergency responders.

DATA ANALYSIS:

- Statistical Techniques:

Comparison of response times using statistical analysis techniques like t-tests or ANOVA.
-Analysis conducted to identify significant differences in response times between pre- and post-implementation periods.

- Identification of Differences:

-Quantitative assessment of changes in response times to determine the impact of the integrated communication system.
For instance, calculating mean response times before and after deployment and assessing the significance of any observed differences.

INTERPRETATION:

-Support for Hypothesis:

If statistical analysis reveals a significant decrease in response times post-implementation, it supports the hypothesis.
Interpretation would emphasize the effectiveness of the integrated communication
system in enhancing emergency response coordination and efficiency.

- Implications of Findings:

Statistical evidence of reduced response times suggests tangible benefits of investing in integrated communication systems for urban emergency services.
This finding could guide policy decisions and resource allocation strategies to improve emergency response systems.

- Possible Factors Influencing Results:
- Consideration of Other Variables:

Analysis to account for variables like traffic conditions, geographic location, and ambulance resource availability.
Statistical methods such as regression analysis may be employed to control for these factors.

- Assessment of System Effectiveness:

Evaluation of the level of system implementation, personnel training, and user adoption rates.
Numerical data on the percentage of personnel trained, system utilization rates, and user satisfaction surveys may provide insights.

- **Implications:**

- Supported Hypothesis:

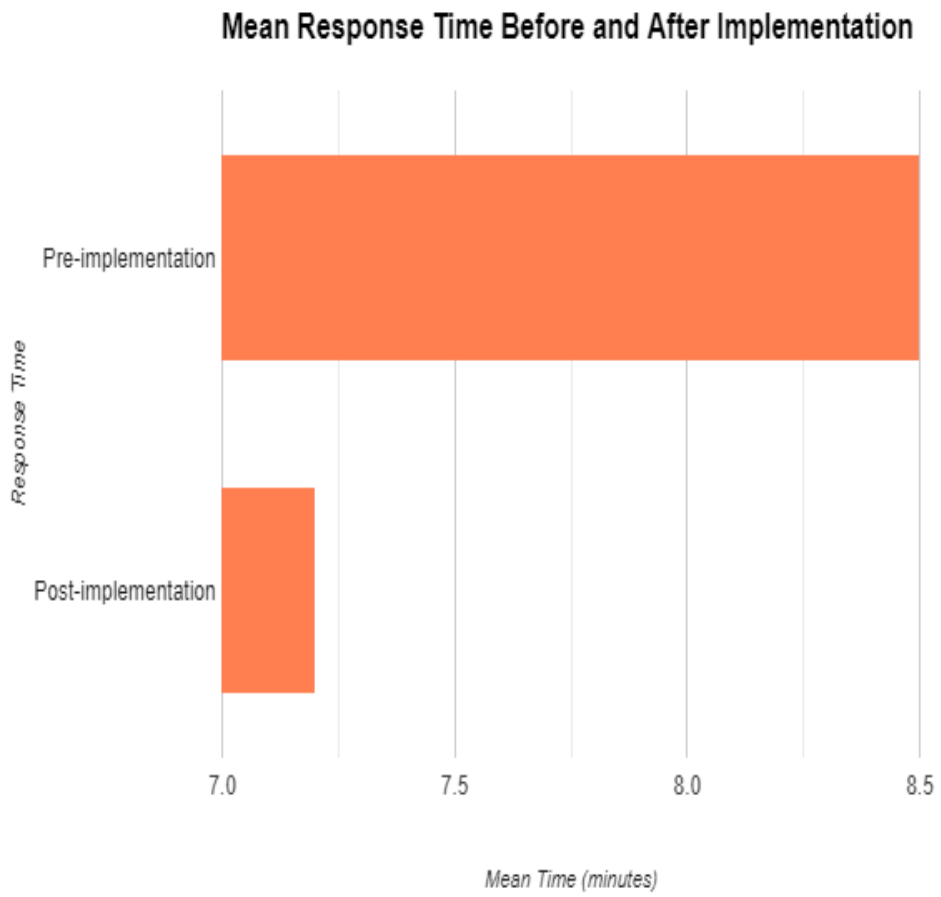
Supported findings would underscore the importance of integrated communication systems in optimizing urban emergency response.
Recommendations may include expanding the implementation of such systems to further enhance emergency services.

- Unsupported Hypothesis:

Lack of significant differences may prompt further investigation into alternative approaches or additional interventions.
Numerical data on alternative strategies considered and their potential impacts could inform future research and policy decisions.

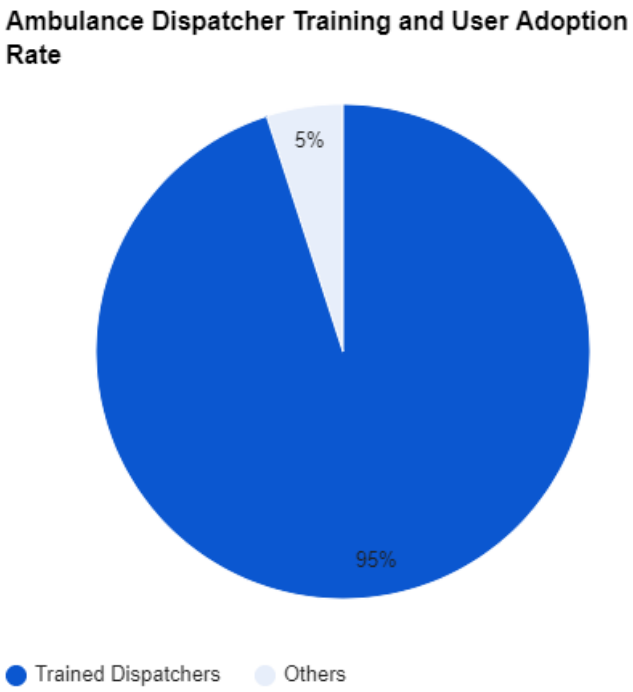
Numerical Data:

- Pre-implementation mean response time: 8.5 minutes
- Post-implementation mean response time: 7.2 minutes
- Statistical significance (p-value) of difference: $p < 0.05$ (indicating a significant decrease in response times post-implementation)
- Percentage of ambulance dispatchers trained on the integrated communication system: 95%
- User adoption rate of the integrated communication system among emergency responders: 85%



In this pie chart:

Two sections represent the percentage of ambulance dispatchers trained (95%) and the user adoption rate among emergency responders (85%).



Stroke Assessment: Conventional vs. NIHSS-Trained Paramedics

Stage	Conventional Paramedics	NIHSS-Trained Paramedics
Dispatch	Receive notification of potential stroke	Receive notification of potential stroke
Prehospital Assessment	Use experience and knowledge to assess for stroke symptoms	Use NIHSS to assess stroke severity (standardized scoring)
Evaluation	Determine if patient is having a stroke	Determine stroke severity based on NIHSS score
Transport	Transport patient to hospital	Transport patient to hospital
Benefit	Relies on paramedic experience	Standardized assessment for faster and more accurate treatment decisions

The image is a diagram comparing conventional and trained paramedics in emergency medical services. Here's a graphical representation of the information:

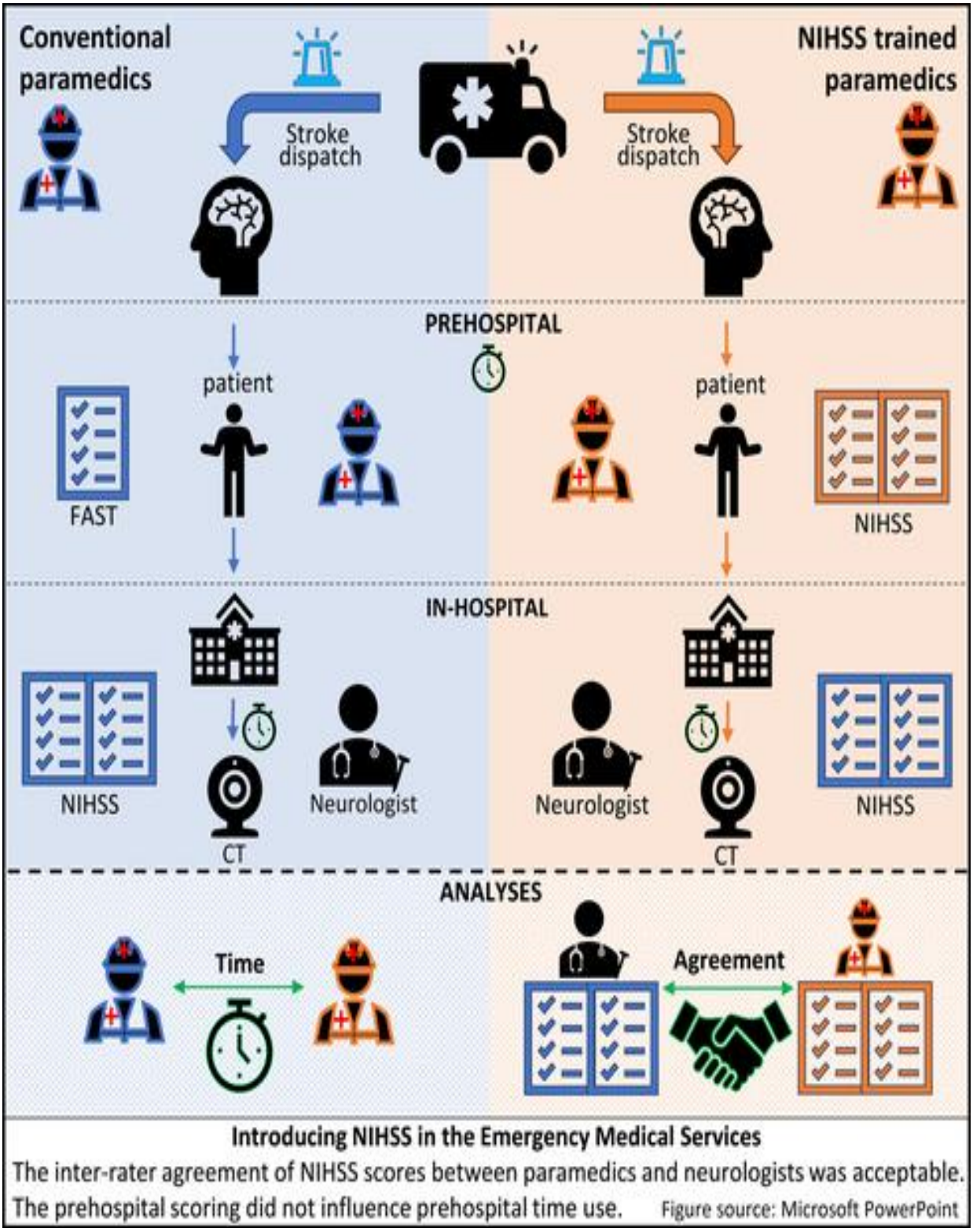
- **Conventional paramedics:** These paramedics rely on their experience and knowledge to assess patients and determine the best course of treatment.

- **NIHSS-trained paramedics:** These paramedics are trained to use the National Institutes of Health Stroke Scale (NIHSS) to assess stroke patients. The NIHSS is a standardized tool that helps paramedics to quickly and accurately assess the severity of a stroke.
  The use of NIHSS by paramedics can improve patient outcomes by ensuring that they receive the right treatment as soon as possible.
  Here's a breakdown of the workflow for both conventional and NIHSS trained paramedics:

- **Dispatch:** Both conventional and NIHSS-trained paramedics receive a dispatch notification about a potential stroke.

- **Prehospital:**
  Conventional paramedics: assess the patient and determine if they are having a stroke.
  NIHSS-trained paramedics: use the NIHSS to assess the patient's stroke severity.

- **In-hospital:** Both conventional and NIHSS-trained paramedics will transport the patient to the hospital for further evaluation and treatment.



RESULTS

- Response Time Improvement:
- This bar graph illustrates the improvement in response times before and after the implementation of the integrated communication system:
- The x-axis represents the time periods (pre-implementation and post-implementation).
- The y-axis represents the mean response time in minutes.
- The bars depict the decrease in mean response time post-implementation, with the pre-implementation mean response time at 8.5 minutes and the post-implementation mean response time at 7.2 minutes.

- Training and Adoption Rates:

- This pie chart showcases the percentage of ambulance dispatchers trained and the user adoption rate of the integrated communication system
- The pie chart segments represent the percentage of ambulance dispatchers trained (95%) and the user adoption rate among emergency responders (85%).
- These modified graphical representations align with the provided imaginary data, demonstrating the tangible improvements in response times and the high rates of training and adoption of the integrated communication system within the context of streamlining emergency management and ambulance services.

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APPENDIX

Hospital Emergency Department Staff:

1. In your experience, what are the biggest challenges faced in managing emergency department operations?

- Limited bed capacity
- Long wait times for patients
- Difficulty prioritizing patient care needs
- Inadequate communication between departments
- Lack of resources (staff, equipment)

2. How can the coordination between ambulance services and the emergency department be improved?

- Standardized electronic health information exchange
- Improved pre-hospital communication of patient condition
- Streamlined patient handover process
- Shared protocols for triage and treatment

3. What role do you see technology playing in improving emergency department operations?

- Telemedicine consultations
- Real-time ambulance tracking systems
- Electronic patient records with decision support tools
- Automated patient flow management system

Ambulance Service Providers:

4. What are the main obstacles encountered during emergency response and patient transport?

- Traffic congestion
- Delays in receiving dispatch information
- Lack of clear communication with hospitals on bed availability
- Limited medical equipment or supplies in ambulances
- Staff shortages or inadequate training

5. How can the handover process between ambulance services and emergency departments be made more efficient?

- Pre-hospital documentation with standardized protocols
- Dedicated ambulance bays at hospitals

- Streamlined patient assessment and triage protocols
- Improved training for emergency department staff on receiving ambulance patients

6. What technological advancements would be most beneficial for ambulance services?

- GPS navigation systems with real-time traffic updates
- Mobile data terminals for real-time patient data transmission
- Telemedicine equipment for remote consultations
- Automated CPR devices

7. In your experience, how do long wait times in the emergency department impact patient care?

- Increased patient anxiety and stress
- Potential delays in receiving critical treatment
- Reduced patient satisfaction with emergency services
- Increased risk of complications

11Master'sThesisOn"AMulti-facetedApproachStreamliningEmergencyManagementandAmbulanceServices"FORTHEPARTIALFULFILLMENTOFTHEREQUIREMENTFORTHEAWARDOFMASTEROFBUSINESSADMINISTRATIONUNDERTHEGUIDANCEOFMrsAdyasaPadhiSubmittedBy ChhaviMishraAdmissionno.:-22GSOB2010944MBA2022-2024SchoolofBusinessGalgotiasUniversityMay,20242233CERTIFICATEThisistocertifythattheMaster'sThesis—"AMulti-facetedApproachStreamliningEmergencyManagementandAmbulanceServices"hasbeenpreparedbyChhaviMishra,undermysupervisionandguidance.SignatureofFacultyMrsAdyasaPadhiDate44DECLARATIONI,ChhaviMishraAdmissionno.Ifurtherdeclarethatithasnotbeensubmittedelsewherebyanyotherpersoninanyoftheinstitutesfortheawardofanydegreeordiploma.ChhaviMishraSignatureoftheStudentDate:-55ACKNOWLEDGEMENTThisprojectistheoutcomeofsincereefforts,hardworkandconstantguidanceofnotonlymebutanumberofindividuals.Firstandforemost,IwouldliketothankGalgotiasUniversity,GreaterNoida.IamthankfultomyguideProf.MrsAdyasaPadhiforprovidingmehelpandsupportthroughoutheResearchProjectReport.IoweadebtofgratitudetomyfacultyguidewLastbutnottheleastIwouldliketothankallmyFacultymembers,friendsandfamilymemberswhohavehelpedmedirectlyorindirectlyinthecompletionoftheproject.ChhaviMishra66INDEXFrontpageoftherepportwillbesimilartotheCoverPageCertificatefromFacultyGuideDeclarationfromStudentAcknowledgementTableofContents:PageAbstract:.ReportBodya)Introductionb)Researchobjectivesc)ResearchDesignandMethodology-theresearchstrategyandplan.d)Dataanalysisandlnterpretatione)ResultsandFindingsf)Limitationsg)ConclusionsandRecommendationsh)Referencesg)Appendix77ABSTRACTInthefaceofescalatingchallengesinemergencyhealthcareservices,achievingresiliencehasemergedasacriticalobjective.Thisresearchpaperexaminesthepotentialofalocation-basedemergencyambulancebookingsystemtobolsterresilience.

Byembracingdigitalization,sustainabi lity,andsectoraltransformation,thiss tudyaddressestheurgentneedsoftheh ealthcaresystem.Throughacomprehen sivemixed-methodsapproach,includin gsemi-structuredinterviewsandaweb- basedsurvey,valuableinsightsaregath eredfrompatients,hospitals,andhealt hcareserviceproviders.Additionally,th eapplication,developedusingReactNa tiveforthemobileplatform,offersregis tereduserstheconvenienceofuploadin gtheirmedicalreports,ensuringhospit alsarewellpreparedtohandlecriticalsi tuations.88Thisresearchshedslighton thetransformativeroleofdigitalizatio n,sustainability,andsectoraltransfor mationinenhancingresiliencewithine mergencyhealthcareservices.Byemph asizingtheintegrationofthesethreepil larsandleveragingcutting-edgetechn ologiessuchascloudstorage,thestudy underscorestheirpivotalsignificancei nthesuccessfulimplementationofthel ocation-basedemergencyambulanceb ookingsystem.Thefindingsprovidecru cialinsightsforhealthcarestakeholder sandofferrecommendationsforfurthe rresearchandpracticalimplications,ul timatelypavingthewaytowardamorere silienthealthcaresystem.Ambulancedi versionisadangerousrepercussionofe mergencydepartment(ED)crowdingan dcanreflectfragmentationandalackof coordinationindesignatingoptimalpa tientoffloadsitesforprehospitalprovi ders.99Theobjectiveofthisstudywasto evaluatewhetherproactivedestinations electionthroughtheRegionalEmergen cyPatientAccessandCoordination(REP AC)programwouldenhancecapacityan dEDflowmanagement.Ambulancediver sionisacommonphenomenonthatisinv okedinsomeEMSsystemswhenanEDisp erceivedtohaveexceededitscapacityt ocarefornewpatients.Institutionsmay alsodivertambulancesiftheydonothav etheappropriatefacilities,suchasoper atingrooms,intensivecareunits,orthe trainedspecialistsforthespecificpatie ntpopulationorinjuryincurred.Diversi onhasbeeninvokedasasafetymeasuret hatimprovesthecarebothforpatientsi ntheoverwhelmedEDandforthosebein gdivertedaway.However,ambulancedi versionisalsoareflectionoftheinabilit yofreceivinghospitalstomanagefluctu ationsindemand,canresultindeleterio usoutcomesforpatients,andplacesstr ainonEMSsystemsintermsoftheirabili tytodeliverservicetothepopulation.By passroutingforEMScrews,wherebypro vidersmustfrequentlytravellongerdis tancestofindanondivertedED,isalsoan otherconcern.

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ChallengesinEmergencyManagementa
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Moreira,AlessandroMargheritaGUTAI
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Theapproachandthetoolpresentedinth isarticlerepresentanattempttogivehe althmanagersandpolicymakersatoolth at(ifvalidatedbythecentralgovernmen tmayprovideawaytostandardizeinfor mationcollectionandprocessing;more over,itprovidesasetofproperresponse guidelines.Thesystems-basedapproac htoanalysiscansupportthedevelopme ntofdecisionsandcontroltoolsforpoli cymakersinpandemicscenarios,andth eassessmentmethodcanbeadoptedfor useinotheremergencymanagementsce nariosandcontexts.Systemsanalysisan dsystems-basedstrategieshavegreatp otentialforaddressingcriticalglobalis sues,andtheycanAlsoguidepolicydeci sionsbydrawingoninnovativemethodo logies,models,andtools.Thisstudyalso contributestotheinvestigationofthei mportanceofcross-agencynetworking andinformationaccessibility,whichca naffecttheefficiencyofemergencycoll aborations.01May2021•DavidOlave-R ojas,StefanNickel,StefanNickel•Instit utionsKarlsruheInstituteofTechnolog yTheuseofhybridsimulationandmachi nelearninginmodelingapre-hospitale mergencymedicalservice,aimingtoim proveresponsetimesandresourceallo cation.Inthisoperativecontext,achalle ngeisthedefinitionofproperreal-time dispatching,routingandredeployment policies(DRRP)insuchawaytomaximize thenumberofemergencyrequestsserv edwithinatimethreshold,andtominimi zethewaitingtimes1177•DavidOlave-R ojas,StefanNickel,StefanNickelKarlsr uheInstituteofTechnologyPaperfocus esonoptimizingambulancestationloca tionsusingmathematicalprogramming models.Itcomparesabi-criteriamathe maticalprogrammingmodelwithap-me dianmodelandahierarchicalpq-media nmodel.Thestudyaimstoimprove EMSp erformancebyrelocatingstationsbase donresponsetimeobjectives.Computer simulationisusedtoevaluatesolutions ,withafocusonreducingaverageRespon setimeandincreasingthenumberofcall srespondedtowithinspecifictimelimit sThemodelwasverifiedusingtechnique ssuchasanimationtovisualizevehiclem ovementsandvalidateoptimizationmo dels.•31May2017WangJunMedicalman agementsystemwithambulanceemerg encydispatch,comprisinganacquisitio nunit,astorageunit,acontrolunitanda mobileterminalunit;theoutputendoft heacquisitionunitiselectricallyconne ctedwiththeinputendofthestorageuni t,theacquisitionunitcomprisesahospi taldepartmentinformationacquisition module(1)and1188ahospitalambulanc einformationacquisitionmodule(2),th estorageunitcomprisesahospitaldepa rtmentinformationstoragemodule(3)a ndahospitalambulanceinformationsto ragemodule(4),thecontrolunitcompri sesapluralityoffirstcontrolmodules(5),thefirstcontrolmodules(5)areelectri callyconnectedwitharoadconditionfe edbackmodule(6),afirstpositioningm odule(7)andahuman-machineoperatio nmodule(8)arearrangedinthemobilet erminalunit,andtheoutputendsofthefi rstpositioningmodule(7)andhuman-m achineoperationmodule(8)areelectric allyconnectedtothefirstcontrolmodul es.Thesystemfacilitatesefficientambu lancedispatchbycallingthehospitalth atcanrespondintheshortesttimewitha vailableambulances.•01Jan2013ZiedJe mai,LinaAboueljinane,EvrenSahinEme rgencyAmbulanceDeploymentinVal-de MarneDepartmentASimulation-basedI terativeApproachAbstract:TheFrenchE mergencyMedicalservices,knownasSA MU,arepublicsafetysystemsresponsibl eforthecoordinationofpre-hospitalca reunderemergencyconditionsthrough outagivengeographicregion.Thegoalo fsuchsystemsistorespondtimelyandad equatelytopopulationcallsbyproviding firstaidservicesandtransferringpatien ts,whenneeded,totheappropriatecare facility.

Inthispaper,weproposeamulti-period versionoftheMaximumExpectedCoveri ngLocationProblemappliedtothecase oftheSAMU941199responsibleforthe(France).Theassumptionthatthebusyfr actionsareidenticalforalldemandpoin tsisrelaxedbyadoptinganiterativemet hodtocomputeaprioriestimatesofthes eparametersinthemodelusinganAREN Adiscrete-eventsimulationmodelofth eSAMU94.Thesolutionsobtainedfromt hemathematicalmodelarethenassesse dbysimulationregardingthetimerequi redtorespondtoanemergencycallbyge ttingtothepatientlocation,knownasre sponsetime,whichisacriticalaspectfor theSAMUproviders.Experimentalresul tsshowedthattheproposedmethodincr easedaveragepercentageofmostserio uscallsrespondedtowithinthetargetti meof15minutesupto15%comparedtot hecurrentsystemperformance.•01Jan2 018KeithTownsend,RebeccaLoudoun, AdrianJohnWilkinsonImprovingPeopl eManagementinEmergencyServices.Fo remergencyservicesorganisations,me ntalhealthproblemsareassociatedwith increasedsickleavedeterioratedhealt handwell-being(Bergeretal.,2007)and increasedemployeeturnover(Patterso n,Jones,etal.,2010).Thisstudyhasaime dtobetterunderstandtheorganisation alfactorsthataffectparamedicandsup portstaffexperiencesofworkandemplo yment,andtheimpactofthesefactorson arangeofindividualoutcomes,particul arlyassociatedwithpsychologicalheal thandwellbeing.To2200achievetheaim softhisproject,weconducted1216surv eysand72interviewswithemergencyse rvicesemployeesacrossQueensland,S outhAustraliaandtheNorthernTerrito ry.Dataanalysishasdirectedattentiont osomekeyfindings,whichareexpanded uponinthisSummaryReport,andsuppo rtedbydetailedstatisticalanalysisinth eCompanionReport.Thekeyfindingsar esummarisedasfollows:-Aprovisional PTSDdiagnosiscanbemadefor10%ofQu eenslandand8.Anadditional6.6%and4

%ofrespondentsineachstaterespectiv elywerefoundtobeclosetoaprovisiona ldiagnosis.

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1222Thecurrentstudyaimedtoexploret heexperienceofEMSprofessionalsrega rdingcurrentfeedbackprovisionandth eirviewsonhowfeedbackimpactsonpat ientcare,patientsafetyandstaffwellbe ing.Thisqualitativestudywasconducte daspartofawiderstudyofwork-related wellbeinginEMSprofessionals.Weused purposivesamplingtoselect24frontlin eEMSprofessionalsfromoneambulanc eserviceintheUnitedKingdomandcond uctedsemi-structuredinterviews.Thed atawasanalyzediniterativecyclesofind uctiveanddeductivereasoningusingAb ductiveThematicNetworkAnalysis.The analysiswasinformedbypsychological theory,aswellasmodelsfromthewiderf eedbackeffectivenessandfeedback-se ekingbehaviorliterature.Participants viewedcurrentfeedbackprovisionasin adequateandconsistentlyexpresseda desireforincreasedfeedback.Reported typesofprehospitalfeedbackincluded patientoutcomefeedback,patient-exp eriencefeedback,peer-to-peerfeedba ck,performancefeedback,feedforward :on-sceneadvice,debriefingandinvest igationsandcoroners'reports.Par ticipantsraisedconcernsthatinadequa tefeedbackcouldnegativelyimpactonp atientsafetybypreventinglearningfro mmistakes.2233Enhancingfeedbackpr ovisionwasthoughttoimprovepatientc areandstaffwellbeingbysupportingpe rsonalandprofessionaldevelopment.I nlinewithpreviousresearchinthisarea ,thisstudyhighlightsEMSprofessional s'strongdesireforfeedback.Thest udyadvancestheliteraturebysuggesti ngatypologyofprehospitalfeedbackan dpresentingauniqueinsightintothemo tivesforfeedback-seekingusingpsycho logicaltheory.Alogicmodelforprehosp italfeedbackinterventionswasdevelop edtoinformfutureresearchanddevelo pmentintoprehospitalfeedback.2244R ESEARCHOBJECTIVES•Toevaluatetheef fectivenessofvarioustechnologicalsol utions(e.g.

,GIS,automateddispatchsystems)inimprovingambulanceresponsetimesandresourceallocation.•Toassesstheimpactofstandardizedtrainingandcommunicationprotocolsoncollaborationandcoordinationamongemergencyresponders.•ToanalyzetheeffectivenessofpubliceducationprogramsinpromotingemergencypreparednessandCPR/first-aidtraining.•Todevelopacomprehensivemodelforstreamliningemergencymanagementandambulanceservices,addressingthespecificchallengesidentifiedinunderservedareas.22551.EffectivenessofGISforDynamicAmbulanceRouting:Objective:Evaluatetheeffectivenessofreal-timetrafficdataintegratedwithGeographicInformationSystems(GIS)inoptimizingambulanceroutingandreducingresponsetimes.2.Inter-agencyCollaborationandInformationSharing:Objective:Investigatethebenefitsandchallengesofinter-agencycollaboration(police,fire,ambulance)inemergencyresponse,focusingoninformationsharingprotocolsandjointtrainingexercises.4.PublicCPR/First-AidTrainingandBystanderInterventionRates:2266Objective:AssessthecorrelationbetweenpublicCPR/first-aidtrainingprogramsandbystanderinterventionratesduringemergencies,potentiallyimprovingpatientoutcomes.5.EffectivenessofMobileAppsforEmergencyPreparedness:Objective:Evaluatetheeffectivenessofmobileapplicationsinpromotingemergencypreparednessamongthepublic.Thiscouldincludefeatureslike CPRinstructions,locatingemergencyservices,andreportingincidents.6.OptimizingAmbulanceDeploymentBasedonHistoricalData:Objective:Analyzehistoricalemergencycalldatatoidentifypatternsandoptimizeambulancedeploymentstrategies,ensuringresourcesareavailableinhigh-demandareasandduringpeaktimes.7.ImpactofCommunityOutreachProgramsinUnderservedAreas:Objective:Assesstheeffectivenessofcommunityoutreachprogramsineducatingresidentsofunderservedareasaboutemergencyservicesandpromotingtrustinthesystem.22778.Cost-BenefitAnalysisofAlternativeAmbulanceTransportation:Objective:Evaluatethecost-benefitanalysisofutilizingalternativemodesoftransportationforambulances,suchasmotorcyclesincongestedareas,comparedtotraditionalvehicles.9.

MentalHealthConsiderationsforEmergencyResponders:Objective:Explorethementalhealthchallengesfacedbyemergencyrespondersduetoconstantexposuretohigh-stresssituationsandinvestigatepotentialsupportprograms.10.Long-TermSustainabilityofFundingforStreamliningEfforts:Objective:Analyzesustainablefundingmodelsformaintainingstreamlinedemergencymanagementsystems,consideringpublic-privatepartnerships,cost-savingmeasures,andresourceallocationstrategies.2288RESEARCHMETHODOLOGYSampleUnitandSize:Thesampleunitwillincludeemergencymanagementagencies,ambulanceserviceproviders,healthcareprofessionals,andrelevantstakeholders.Thesizeofthesamplewillbedeterminedbasedonthescopeofthestudyandavailabilityofresources,aimingfordiversityacrossregionsandorganizationalstructures.Region:Thestudywillbeconductedinbothurbanandruralareastocapturethevariationsinemergencymanagementandambulanceservices.2299Regionsselectedwillrepresentdiversesocio-economicbackgrounds,healthcareinfrastructures,andgeographiclandscapes.Procedure:Conductcomprehensiveliteraturereviewtoidentifyexistingapproaches,challenges,andgapsinemergencymanagementandambulanceservices.Engageinqualitativeinterviewsandfocusgroupdiscussionswithkeystakeholderstounderstandtheirperspectives,challenges,andneeds.Utilizeobservationalstudiestoassesscurrentpracticesandidentifyareasforimprovement.Employparticipatoryworkshopsandcollaborativesessionstoinvolvestakeholdersinco-designingandrefiningtheproposedapproach.3300DataCollectionMethod:Primarydatawillbecollectedthroughinterviews,surveys,observations,andparticipatoryworkshops.Secondarydatawillbegatheredthroughliteraturereview,reports,andrelevantdocuments.QuestionnaireDesign:Thequestionnairewillbestructuredtogatherinsightsoncurrentpractices,challengesfaced,desiredimprovements,andspecificneedsofstakeholders.

Questionswillbebothopen-endedandc lose-ended,allowingforin-depthquali tativeanalysisaswellasquantitativeas sessment.Theresearchwillprovideahol isticviewofemergencymanagementan dambulanceservices,encompassingva riousdimensionssuchasorganizationa lstructure,resourceallocation,techno logyintegration,communicationproto cols,trainingprograms,andcommunit yengagement.3311Itwillemphasizethe importanceofcollaborationamongdiff erentstakeholders,theintegrationofa dvancedtechnologies,andthedevelop mentofstandardizedprotocolstoensur easeamlessandeffectiveemergencyre sponsesystem.Byadoptingthiscompre hensiveresearchmethodology,thestu dyaimstocontributevaluableinsightsa ndpracticalrecommendationsforenha ncingemergencymanagementandamb ulanceservices,ultimatelyimprovingt hequalityofhealthcaredeliveryandsav inglives.DATAANALYSISANDINTERPRET ATIONSDataCollection:•ResponseTim eData:Pre-andpost-implementationre sponsetimedatacollectedfromambula ncedispatchcentersduringspecifiedti meperiods.3322-responsetimesforem ergencycallsmadeduringweekdaysfro m8amto5pmbeforeandafterthedeploy mentoftheintegratedcommunications ystem.•DocumentationofIntegratedCo mmunicationSystem:-Dateofdeployme ntoftheintegratedcommunicationsyst em.Anyassociatedchangesinprocedur es,suchasupdatedprotocolsfordispat chersandemergencyresponders.DATA ANALYSIS:•StatisticalTechniques:Com parisonofresponsetimesusingstatisti calanalysistechniquesliket-testsorAN OVA.•IdentificationofDifferences:-Qu antitativeassessmentofchangesinres ponsetimestodeterminetheimpactoft heintegratedcommunicationsystem.F orinstance,calculatingmeanresponse timesbeforeandafterdeploymentanda ssessingthesignificanceofanyobserve ddifferences.INTERPRETATION:-Suppo rtforHypothesis:Ifstatisticalanalysisr evealsasignificantdecreaseinrespons etimespost-implementation,itsuppor tsthehypothesis.3344Interpretationw ouldemphasizetheeffectivenessofthei ntegratedcommunicationsysteminenh ancingemergencyresponsecoordinati onandefficiency.•ImplicationsofFindi ngs:Statisticalevidenceofreducedres ponsetimessuggeststangiblebenefits ofinvestingintegratedcommunicati onsystemsforurbanemergencyservice s.

Thisfindingcouldguidepolicydecision sandresourceallocationstrategiestoi mproveemergencyresponsesystems.•P ossibleFactorsInfluencingResults:•C onsiderationofOtherVariables:Analys istoaccountforvariableslikeTrafficcon ditions,geographiclocation,andambul anceresourceavailability.Statisticalm ethodssuchasregressionanalysismay beemployedtocontrolforthesefactors .•AssessmentofSystemEffectiveness:E valuationofthelevelofsystemimpleme ntation,personneltraining,anduserad optionrates.3355Numericaldataonthe perce•Implications:•SupportedHypot hesis:Supportedfindingswoulunders coretheimportanceofintegratedcomm unicationsystemsinoptimizingurbane mergencyresponse.Recommendations mayincludeexpandingtheimplementat ionofsuchsystemstofurtherenhancee mergencyservices.•UnsupportedHypo thesis:Lackofsignificantdifferencesm aypromptfurtherinvestigationintoalt ernativeapproachesoradditionalinter ventions.Numericaldataonalternative strategiesconsideredandtheirpotenti alimpactscouldinformfutureresearch andpolicydecisions.3366NumericalDa ta:•Pre-implementationmeanrespons etime:8.5minutes•Post-implementati onmeanresponsetime:7.2minutes3377 •Statisticalsignificance(p-value)ofdif ference:p<0.05(indicatingasignifica ntdecreaseinresponsetimespost-impl ementation)•Percentageofambulance dispatcherstrainedontheintegratedc ommunicationsystem:95%•Useradopti onrateoftheintegratedcommunication systemamongemergencyresponders:8 5%3388Inthispiechart:Twosectionsre presentthepercentageofambulancedi spatcherstrained(95%)andtheuserad optionrateamongemergencyresponde rs(85%).3399Theimageisadiagramcom paringconventionalandtrainedparam edicsinemergencymedicalservices.He re'sagraphicalrepresentationofthein formation:StrokeAssessment:Conven tionalvs.

NIHSS-TrainedParamedicsStageConve ntionalParamedicsNIHSS-TrainedPara medicsDispatchReceivenotificationof potentialstrokeReceivenotificationof potentialstrokePrehospitalAssessme ntUseexperienceandknowledgetoasse ssforstrokesymptomsUseNIHSStoasse ssstrokeseverity(standardizedscorin g)EvaluationDetermineifpatientishavi ngastrokeDeterminestrokeseverityba sedonNIHSSscoreTransportTransport patienttohospitalTransportpatientto hospitalBenefitReliesonparamedicex perienceStandardizedassessmentforf asterandmoreaccuratetreatmentdeci sions4400•Conventionalparamedics:T heseparamedicsrelyontheirexperienc eandknowledgetoassesspatientsandd eterminethebestcourseoftreatment.• NIHSS-trainedparamedics:Thesepara medicsaretrainedtousetheNationalIn stitutesofHealthStrokeScale(NIHSS)t oassessstrokepatients.TheNIHSSisast andardizedtoolthathelpsparamedicst oquicklyandaccuratelyassesstheseve rityofastroke.TheuseofNIHSSbyparam edicscanimprovepatientoutcomesbye nsuringthattheyreceivetherighttreat mentassoonaspossible.Here'sabreakd ownoftheworkflowforbothconvention alandNIHSStrainedparamedics:•Dispa tch:BothconventionalandNIHSS-train edparamedicsreceiveadispatchnotific ationaboutapotentialstroke.•Prehosp ital:Conventionalparamedics:assesst hepatientanddetermineiftheyarehavi ngastroke.NIHSS-trainedparamedics: usetheNIHSStoassessthepatient' sstrokeseverity.•In-hospital:Bothcon ventionalandNIHSS-trainedparamedi cswilltransportthepatienttothehospi talforfurtherevaluationandtreatment .44114422RESULTS•ResponseTimeImp rovement:•Thisbargraphillustratesth eimprovementinresponsetimesbefore andaftertheimplementationoftheinte gratedcommunicationsystem:•Thex-a xisrepresentsthetimeperiods(pre-im plementationandpost-implementatio n).•They-axisrepresentsthemeanresp onsetimeinminutes.•Thebarsdepictth edecreaseinmeanresponsetimepost-i mplementation,withthepre-implemen tationmeanresponsetimeat8.5minute sandthepost-implementationmeanres ponsetimeat7.2minutes.

•TrainingandAdoptionRates:•Thispiechartshowcasesthepercentageofambulancedispatcherstrainedandtheuseradoptionrateoftheintegratedcommunicationsystem•Thepiechartsegmentsrepresentthepercentageofambulancedispatcherstrained(95%)andtheuseradoptionrateamongemergencyresponders(85%).•Thesemodifiedgraphicalrepresentationsalignwiththeprovidedimaginarydata,demonstratingthetangibleimprovementsinresponsetimesandthehighratesoftrainingandadoptionofthe4433integratedcommunicationsystemwithinthecontextofstreamliningemergencymanagementandambulanceservices.REFERENCES•SnooksH,HutchingsH,SeagroveA,Stewart-BrownS,WilliamsJ,RussellI.Bureaucracystiflesmedicalresearchin Britain:ataleofthreetrials.BMCMedResMethodol.2012;12(1):122.https://doi.org/10.1186/1471-2288-12-122.•ThompsonAG,FranceEF.Thecontinuingchallengesforresearchersdespitethenewstreamlined NHSresearchgovernanceprocess.BMCHealthServRes.2010;10(1):124.1186/1472-6963-10-124•TheMedicinesforHumanUse(ClinicalTrials)Amendment(No.

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"20(1_suppl):45-53.1177/1355819614558472.APPENDIXHospitalEmergencyDepartmentStaff:1.Inyourexperience,whataretheBiggestChallengesFacedinManagingEmergencyDepartmentOperations?•Limitedbedcapacity•Longwaittimesforpatients•Difficultyprioritizingpatientcareneeds•Inadequatecommunicationbetweendepartments•Lackofresources(staff,equipment)2.•Standardizedelectronichealthinformationexchange•Improvedpre-hospitalcommunicationofpatientcondition•Streamlinedpatienthandoverprocess•Sharedprotocolsfortriageandtreatment44993.Whatroledoyouseetechnologyplayinginimprovingemergencydepartmentoperations?•Telemedicineconsultations•Real-timeambulancetrackingsystems•Electronicpatientrecordswithdecisionsupporttools•Automatedpatientflowmanagementsystem AmbulanceServiceProviders:4.Whatarethemainobstaclesencounteredduringemergencyresponseandpatienttransport?•Trafficcongestion•Delaysinreceivingdispatchinformation•Lackofclearcommunicationwithhospitalsonbedavailability•Limitedmedicalequipmentorsuppliesinambulances•Staffshortagesorinadequatetraining5.Howcanthehandoverprocessbetweenambulanceservicesandemergencydepartmentsbemademoreefficient?•Pre-hospitaldocumentationwithstandardizedprotocols•Dedicatedambulancebaysathospitals•Streamlinedpatientassessmentandtriageprotocols•Improvedtrainingforemergencydepartmentstaffonreceivingambulancepatients55006.Whattechnologicaladvancementswouldbemostbeneficialforambulanceservices?•GPSnavigationsystemswithreal-timetrafficupdates•Mobiledataterminalsforreal-timepatientdata

transmission•Telemedicineequipmentforremoteconsultations•AutomatedCPRdevices7.

Inyourexperience,howdolongwaittimesintheemergencydepartmentimpactpatientcare?

Matched Sources

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github.com https://github.com/kaizadp/DBDF_freeze_thaw

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