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Post-crash response: Situation analysis and recommendations

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Summary

The report focuses on the critical role of post-crash response in mitigating fatalities and injuries, with a specific emphasis on the "Golden Hour"—the first 60 minutes following a crash where immediate care can significantly enhance survival chances. This study examines post-crash response services across various countries, including Ghana, Tanzania, and Zambia, aiming to generate actionable recommendations to enhance these services. Through Key Informant Interviews and a combination of qualitative and quantitative analysis, the report identifies gaps in emergency care systems and suggests improvements based on international benchmarks.

Key recommendations include enhancing coordination among emergency services, developing comprehensive training and accreditation programs for EMS personnel, and implementing community-based training initiatives to empower bystanders. Additionally, the report advocates for public-private partnerships and international collaborations to improve resource allocation and infrastructure development.

Despite ongoing efforts, the report acknowledges that these recommendations are preliminary and subject to further refinement as the project progresses. The dynamic nature of road safety interventions requires flexibility and responsiveness to new insights and data.

1 Introduction

According to the World Health Organization's Global Status Report on Road Safety 2023, the annual number of road traffic deaths amounts to 1.19 million per year. This report indicates that efforts to improve road safety are having an impact, but there's still a significant need for urgent action to further reduce these numbers. It highlights that road traffic crashes remain a leading cause of death among children and youth aged 5–29 years, emphasizing the global health crisis posed by road crashes (World Health Organization, 2023a, 2023b).

Furthermore, the report notes that over 90% of road traffic deaths occur in low- and middle-income countries, which is disproportionate to the number of vehicles and roads in these regions. Vulnerable road users, including pedestrians, cyclists, and motorcyclists, account for more than half of all road traffic deaths, underlining the importance of creating safer environments for these groups. The economic impact is also significant, with road traffic crashes costing most countries about 3% of their gross domestic product (GDP) (World Health Organization, n.d.-a, n.d.-b).

In addition, trauma care resources are severely impacted by RTCs in low- and middle-income countries (LMICs) with estimates indicating roughly one-third of trauma care in sub-Saharan Africa due to injuries arising from road traffic crashes (Vissoci et al., 2017). Improvements in the trauma care system are associated with an average 50% reduction in medically preventable deaths (Yeboah et al., 2014).

The concept of the "Golden Hour" is pivotal in the field of emergency care, that is, the importance for seriously injured victims to receive definitive care within the first 60 minutes following a crash to significantly enhance their probability of survival. This period is crucial for providing immediate care to increase the chance of surviving a crash, predominantly from haemorrhage, which is most common in the minutes to hours following an injury. Thus, emphasizing the need for rapid transport to a hospital for definitive care (Life in the Fast Lane, n.d.).

Incorporating this understanding into the research emphasizes the vital role of post-crash care in reducing fatalities and aligns with the Sustainable Development Goals (SDGs) target 3.6 (reduce road traffic injuries and deaths). It also highlights the necessity for specialized emergency response systems in African countries, where traffic death rates are significantly higher than the global average (World Health Organization, 2023b).

1.1 Purpose of the Report

The purpose of the report is to conduct a comprehensive analysis and generate actionable recommendations to enhance post-crash response services across various countries. The report aims to examine stakeholders' alignment, interest, and influence to form strategic partnerships, capitalize on existing capacities, and avoid redundant efforts. Through the use of Key Informant Interviews (KIIs) and a blend of qualitative and quantitative analysis methods, the report will identify the power dynamics and potential financing sources, paving the way for sustainable project support. Furthermore, the report will scrutinize the emergency care system as a 'chain of interventions', analysing each phase—on-scene, facility, and follow-up—to detect gaps and frame recommendations based on selected benchmarks. The goal is to tailor improvements to the distinct needs of target countries, enhancing the operational efficiency and effectiveness of emergency services through upgraded guidelines, training programs, and capacity-building measures.

1.2 Context of the Report

AfroSAFE, a pivotal initiative aimed at enhancing road safety across Africa, is dedicated to implementing comprehensive strategies to mitigate road traffic injuries and fatalities. Within this broad framework, Work Package 6 (WP6) focuses on post-crash response and specifically addresses the immediate actions and medical interventions following road crashes, aiming to reduce fatalities and improve recovery outcomes. By integrating WP6's focus on effective emergency care and support systems into the larger scheme of AfroSAFE, the project ensures a holistic approach to road safety, covering preventative measures as well as crucial post-crash responses, thereby enhancing the resilience and capacity of healthcare systems to manage and mitigate the impacts of road traffic incidents across the continent.

This assessment is grounded in the Safe System approach, as well as informed by the latest UN Global Road Safety Performance review recommendations (United Nations Economic Commission for Europe, n.d.), which stress on:

- Building comprehensive pre-hospital care systems.
- Enhancing coordination for emergency transportation.
- Systematic injury evaluation and prioritization.
- Training for healthcare professionals in high-trauma facilities.

1.3 Limitations and Assumptions

- The report focuses on specific corridors, which may not fully represent the national scenarios.
- Limitations in data availability are acknowledged.
- It is important to note that the recommendations presented in this report are preliminary and serve as a foundation for the development of future deliverables. As the project progresses, ongoing developments and further analysis may lead to adjustments and refinements.

2 Method

2.1 Stakeholder Analysis

To evaluate stakeholders' perceived capacities, interests, and needs, the study utilized a structured analytical approach informed by Key Informant Interviews (KIIs). Stakeholders included emergency response teams, hospital administrators, police agencies, and representatives from fire-brigades. Interviews were conducted to gather insights into each stakeholder's role, influence, and potential to contribute resources to the post-crash response system.

- **Data Collection:** KIIs were conducted using semi-structured interview guides tailored to capture qualitative and to a small extent quantitative data on stakeholders' perceived capacities, interests, and potential needs.
- **Data Cleaning and Validation:** All collected data was cleaned to ensure accuracy and consistency. Validation was done through cross-referencing responses.
- **Data Analysis:** Qualitative data was analysed thematically to extract patterns and narratives around post-crash care capacities and needs.

2.2 Analysis by Phases of Care

The post-crash system was examined through the lens of the 'chain of interventions': at the scene, facility, and follow-up stages.

Phase-Specific Analysis:

- **At the Scene:** Emergency response effectiveness, time to intervention, and coordination between services (police, fire services, EMS).
- **Facility:** Adequacy of hospital triage systems, availability of specialist care, and infrastructure capabilities.
- **Follow-Up:** Continuity of care, rehabilitation services, and community support systems.

Benchmarking: Current practices in each phase were compared against international best practices identified through literature reviews and expert consultations. Discrepancies were noted as gaps.

2.3 Recommendations Development

Building upon the analysis, a set of tailored recommendations has been developed to enhance the efficiency and effectiveness of post-crash response services in each target country.

Each recommendation was then evaluated based on its potential to improve patient outcomes, system responsiveness, and resource utilization. Recommendations were also assessed for their potential to increase the overall effectiveness of the post-crash response system. Metrics for assessment include response times, patient survival rates, and stakeholder satisfaction levels.

3 Findings and Recommendations

As outlined in Deliverable 6.1, Key Informant Interviews have been conducted with the key stakeholders in all three countries. The below sections are categorized by country and present the summary of information obtained from the interviews, stakeholder analysis by phase of care followed by recommendations for improvements and assessment of their effectiveness.

3.1 Ghana

3.1.1 Results from Interviews

Trauma and Specialist Hospital in Ghana

The summary of the results for the inquiry areas from Trauma and Specialist Hospital in Winneba, Ghana are as follows:

- **Specialities Available 24/7 in the Emergency Department:** The hospital has a variety of specialists available around the clock, including doctors, emergency nurses and physician assistants who always attend to any case of trauma.
- **Training in Emergency Medicine:** Emergency department doctors and nurses receive adequate training in emergency medicine, but there is a need to train more people and make it more efficient.
- **Staff Availability for Road Traffic Crashes:** The hospital has sufficiently trained staff available 24/7 to manage road traffic crash cases. There is a siren located within the hospital, and when it blows, the whole town can hear, and the staff, wherever they are, will rush to the hospital (rushing to the hospital is optional).
- **Coordination with Ambulance Services:** The emergency department effectively coordinates with ambulance services. They receive alert calls and have a procedure for clinical patient handover from ambulance crews to hospital staff.
- **Triage and Resuscitation Facilities:** The hospital has an adequate triage system and resuscitation area. However, the staff would definitely like to expand the facilities. Currently, they face a challenge because they only have a general operating theatre which is not conveniently accessible or located nearby. Ideally, they should have a dedicated theatre right next to the accident and emergency department. This way, if a patient urgently needs surgical services, they can be swiftly taken there instead of having to go to the distant general theatre, which might already be in use. Therefore, it's crucial to establish a specialized theatre directly connected to the emergency unit, specifically designed for accident and emergency cases.
- **Critical Bed Availability and Intensive Care Units:** The hospital has a sufficient number of critical beds (currently there are about 50 beds, but if there are more patients, the hospital has wards). An Intensive Care Unit is also available and sufficient, however, expansion in the near future is desired.
- **Data Collection and Sharing:** Standard data is collected for each patient by the Health Information Unit (this is done electronically), such as the age, sex, the area the person is coming from or hometown, current residential address, the relatives of the patient, and some telephone numbers or contact of their relatives. The data is shared if deemed necessary, for example, with the Regional Health Directorate and police.

- **Critical Equipment and Services:** The hospital is missing several critical pieces of equipment, such as a CT scan, MRI, Mobile X-ray machine, oxygen plant and An ECG machine or echocardiogram.
- **Overall Condition of Emergency Department Facilities:** The Emergency Department facilities are considered to be in very good condition according to a hospital representative. The recommendation is to explore avenues for expanding the facility with a focus on enhancing the emergency theatre, which is of paramount importance. Additionally, there is a significant need to recruit highly qualified medical professionals, including specialists in emergency medicine, medical specialists, and nurses with expertise in emergency care. Increasing the number of such skilled personnel is essential. Furthermore, it is imperative to implement regular training programs for the staff to ensure they are up to date with the latest practices and techniques in emergency care. It is acknowledged that such training initiatives require substantial financial investment. Therefore, securing additional funding to facilitate these training programs is crucial. This funding would also enable the engagement of specialists from various fields to provide advanced training to the existing staff, a move that would be highly beneficial and well-received.
- **Bystander Training in Emergency Situations:** The representative from Trauma and Specialist Hospital in Ghana believes that incorporating basic life support and emergency response training into educational curricula, particularly at the Senior High School level, is of utmost importance. This initiative would equip students with the essential skills to effectively manage emergency situations. Furthermore, extending such training beyond educational institutions to include various agencies and workplaces is critical, as accidents can occur in any setting. Inadequate handling of emergencies often exacerbates the situation, potentially leading to preventable fatalities. To address this issue, it is proposed that community-based training programs be established, particularly in areas prone to accidents, such as those along major roadways. These programs would target the youth and other community members, providing them with the necessary training to respond appropriately to accidents. Such proactive measures could significantly mitigate the adverse outcomes of accidents. The National Road Safety Authority, in collaboration with government bodies, should take a leading role in implementing these training initiatives. By focusing on communities located near high-risk areas, the aim is to prevent untrained individuals from inadvertently causing further harm at accident scenes. This strategic approach would contribute significantly to enhancing the overall emergency response capacity within these communities.

National Ambulance Service in Ghana

The summary of the results for the inquiry areas from the National Ambulance Service, Ghana is as follows:

- **Coverage and Operational Reach:** The Service covers all 261 districts and 275 constituencies in Ghana. They operate nationwide, except in areas not accessible by road. Despite the large number of stations, there are still areas, particularly sub-districts, that need coverage.
- **Staffing and Training:** The Service employs around 2900 staff, including paramedics, advanced EMTs, and basic EMTs. There are only three paramedics due to the necessity of overseas training. Training for EMTs is provided at the institution at Nkenkenso in the Offinso North District, with some advanced training done abroad in collaboration with international partners.

- **Response Protocols and Performance Indicators:** The Service uses a Patient Care Report form to record response times and patient handling details. Performance indicators like on-scene times and travel to hospital times are tracked.
- **Emergency Numbers and Public Awareness:** The unified emergency number in Ghana is 112 (in addition, there are specific numbers for every region that the localities know, and in case they are not getting through with the 112, they can use those numbers). The Service faces challenges with prank calls and strives to increase public awareness about the proper use of the emergency number.
- **Equipment and Capabilities:** The Service relies on the fire service for vehicle extrication. They do not have air ambulances (but the military can and does help) and are considering the introduction of water ambulances.
- **Challenges and Future Directions:** Major challenges include insufficient funding, road congestion, poor road conditions, and the need for more ambulances and staff. Initiatives are in place to address these issues, such as plans to increase ambulance numbers and continuous advocacy for better road infrastructure.
- **Community Engagement and Training:** The Service recognizes the importance of training community first responders, especially in accident-prone areas. However, financial constraints limit the extent of this training.
- **Management and Assessment:** The Service is managed at national, regional, and district levels. According to the interviewee, the facilities and overall condition are seen as satisfactory, indicating room for improvement, especially in areas like air and water ambulance services.
- **Collaborations and Accreditation:** Training collaborations exist with international organisations and foreign partners from the US. The training institution in Ghana is working with the Ghana Tertiary Education Commission for accreditation.
- **Gender Representation and Future Personnel Development:** The male-to-female ratio among staff is approximately 60:40. The service provides equal opportunities for all qualified individuals. Personnel development includes further education and training for advancement.

National Fire Service in Winneba, Ghana

The summary of the results for the inquiry areas from the National Fire Service, Ghana is as follows:

- **Staffing and Capacity:** With a staff strength of 90, the service is understaffed compared to international standards, which suggests a much higher ratio of firefighters to civilians. The ranks range from recruit firemen/firewomen up to senior officers.
- **Response to Emergencies:** The service operates 24-hour shifts due to inadequate facilities. The response time from receiving a distress call to moving out is aimed to be around one minute and 30 seconds. All emergencies within their jurisdiction are attended to, with protocol for handling multiple emergencies and assistance from neighbouring stations if required.
- **Gender Dynamics:** The service is male-dominated due to the physical demands of the job. Females primarily handle administrative duties, and recruitment reflects this dynamic.
- **Training and Development:** Training includes a range of skills from basic firefighting to advanced rescue techniques. However, the practical aspect of training could be more robust. Promotion through the ranks depends on exams and experience.

- **Equipment and Resources:** The station faces significant challenges due to outdated and inadequate equipment. They lack modern rescue tools like effective electric power packs, spreaders, cutters, and proper lighting equipment for night operations.
- **Collaboration and Coordination with Other Services:** The main ally in post-crash scenarios is the Ambulance Service, followed by hospitals and the police (the police's role is insignificant). The separation of the ambulance service from the fire service is seen as detrimental, suggesting a need for closer coordination.
- **Challenges and Recommendations:** Major challenges include inadequate facilities, fuel supply, maintenance issues with vehicles, lack of modern rescue equipment, and inefficient road infrastructure. Recommendations include establishing smaller, more numerous fire stations with appropriate vehicles for Ghana's road conditions and re-integrating the ambulance service. Moreover, other measures are mentioned: firstly, to expand the current road network and secondly to enhance the cooperation with police which currently sometimes may be creating obstacles rather than assisting.
- **Facility and Operational Conditions:** Despite limitations in resources and facilities, the station rates itself highly in terms of service delivery and effectiveness in handling emergencies. However, infrastructure and equipment are considered inadequate.
- **Public Engagement and Communication:** The station faces challenges with public awareness and communication, including managing emergency calls efficiently and educating the public on emergency numbers.
- **Community Training and Emergency Response:** While training community members along highways for emergency response is recognized as beneficial, concerns about mismanagement and misuse of such authority are highlighted. Instead, a focus on more localized fire stations is suggested.

It must be mentioned that when it comes to post-crash response services in Ghana, the involvement of the police is minimal, hence no interview was conducted with them at this stage. Their focus is on managing traffic flow and preventing theft at the scene, essentially maintaining peace and security.

3.1.2 Stakeholder Analysis by Phase of Care

Care at the Scene

Stakeholders Involved: National Ambulance Service, National Fire Service, Bystanders and Community Members, Police (minimal involvement).

Current Capabilities

National Ambulance Service:

- The National Ambulance Service provides nationwide coverage, operating in all 261 districts and 275 constituencies in Ghana. However, there are still areas, particularly sub-districts, that require coverage.
- The service employs about 2900 staff, including paramedics and EMTs. Training is conducted locally and internationally in collaboration with foreign partners.
- They have a structured protocol for response times and patient handling details, tracked via a Patient Care Report form.
- They depend on the Fire Service for vehicle extrication. They lack air ambulances, relying on the military for assistance, and have plans to introduce water ambulances.

National Fire Service:

- Operates 24-hour shifts with a target response time of 1 minute and 30 seconds from distress call to deployment.
- Offers training ranging from basic firefighting to advanced rescue techniques, but practical training needs enhancement.
- Faces significant challenges due to outdated equipment and a lack of modern rescue tools.

Bystanders and Community Members: There is a recognized need for bystander training in basic life support and emergency response, especially in accident-prone areas.

Needs and Challenges

- National Ambulance Service: Needs more ambulances, staff, and improved road infrastructure. Faces challenges with prank calls and requires increased public awareness. Necessity of Joint training with other first responders.
- National Fire Service: Requires modern rescue equipment, fuel supply, and more fire stations. The separation from the ambulance service is viewed as detrimental. Necessity of Joint training with other first responders.
- Bystanders and Community Members: There is a critical need for training programs to equip community members with basic emergency response skills.

Potential Partnerships

1. Partnering with private ambulance services, such as the St. John Ambulance Ghana, could expand coverage to underserved areas and provide additional resources for equipment and training.
2. Collaborations with international emergency response organizations (e.g. Red Cross Society) can bring expertise, funding, and training resources to enhance capabilities.
3. Universities (e.g., the University of Ghana) can play a role in developing curricula for emergency response training and conducting research to improve response strategies.

Facility-Based Care

Stakeholders Involved: Trauma and Specialist Hospitals, National Ambulance Service (Patient Transport), Healthcare Professionals (Doctors, Nurses, etc.).

Current Capabilities of Trauma and Specialist Hospitals:

- Hospitals like the one in Winneba have specialists available around the clock, including doctors and emergency nurses.
- Staff receives adequate training in emergency medicine, though there's a need for more personnel and efficiency improvements.
- Effective coordination exists, with established procedures for patient handover.
- Adequate systems are in place, but expansion is needed to address resource constraints, such as the lack of a dedicated theatre near the emergency department.
- Sufficient critical beds and ICU capacity are available, but expansion is desired.
- Standardized electronic data collection is in place and shared with relevant authorities as needed.
- Lacks critical equipment such as CT scans, MRIs, and mobile X-ray machines.

Needs and Challenges

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- There's a pressing need to expand facilities, particularly emergency theatres and ICUs, to accommodate growing patient volumes.
- Increasing the number of skilled professionals and conducting regular training programs require substantial funding.
- Procuring essential medical equipment to enhance diagnostic and treatment capabilities.

Potential Partnerships

1. Collaborations with private hospitals (e.g., The Bank Hospital, Nyaho Clinic, etc.) for equipment sharing and staff training can alleviate resource constraints.
2. Partnerships with WHO and NGOs like Doctors Without Borders can provide funding, equipment, and training expertise.
3. Joint research initiatives with universities (e.g., the University of Ghana, and Kwame Nkrumah University of Science and Technology) can lead to innovations in trauma care and staff training programs.

Follow-Up Care

Stakeholders Involved: Hospitals (Ongoing Care), National Health Insurance Scheme (NHIS), Community Health Workers, and Rehabilitation Centres.

Current Capabilities

Hospitals: Provide ongoing care and rehabilitation for crash victims, with some facilities offering specialized services.

National Health Insurance Scheme: Covers a significant portion of medical expenses for road traffic crash victims, though coverage gaps exist.

Community Health Workers: Play a vital role in follow-up care and patient education, especially in rural areas.

Needs and Challenges

- There's a need for more rehabilitation centres and services to support long-term recovery.
- Improving NHIS coverage to reduce out-of-pocket expenses for crash victims.
- Enhancing community health workers' capacity to provide follow-up care and education.

Potential Partnerships

1. Collaborating with existing centres to expand services and integrate holistic care approaches.
2. Engaging with organizations focused on rehabilitation and disability care (e.g., Ghana Federation of Disability Organizations) can provide additional resources and expertise.
3. Working with NHIS and private insurers (e.g., Acacia Health Insurance) to improve coverage and reduce financial barriers for patients.

3.1.3 Recommendations for Ghana and their Assessment

Recommendation Nr 1 - Enhanced Coordination

1. Strengthen collaboration between the National Ambulance Service, Fire Service, and Police.
2. Conduct joint training exercises and establish shared communication platforms to improve coordination at accident scenes.

Expected Outcomes:

- By enhancing coordination among emergency services, response times at accident scenes can be significantly reduced. Joint training exercises ensure that all personnel are familiar with coordinated protocols, leading to quicker and more efficient actions during emergencies.
- Shared communication platforms allow for real-time updates and efficient information sharing among responders, reducing delays and misunderstandings.
- Joint efforts foster teamwork, enabling different services to work together seamlessly, leading to more effective on-site management.

Effectiveness: High. The joint training and coordination mechanisms directly address key delays in the post-crash response, ensuring that all involved parties can respond more efficiently. Resources are used more effectively as each service understands its role and responsibilities, reducing redundancies and gaps in response.

Recommendation Nr 2 - Public-Private Partnerships

1. Leverage private sector partnerships to improve resource allocation and infrastructure development.
2. Collaborate with private ambulance services and healthcare providers to expand coverage and enhance capabilities.

Expected Outcomes:

- Private partnerships bring in additional resources, including funding, equipment, and expertise, which can be utilized to enhance existing services.
- Collaborations with private ambulance services ensure more comprehensive geographical coverage, reaching underserved areas quickly.
- Investments from the private sector help improve hospital facilities, emergency response centres, and road infrastructure.

Effectiveness: Medium to High. While private partnerships can significantly improve resources and infrastructure, careful management is required to ensure alignment with public sector goals and regulations. Access to private sector resources allows for better-equipped facilities and services, leading to improved service delivery and patient outcomes.

Recommendation Nr 3 - Insurance Partnerships

1. Collaborate with the National Health Insurance Scheme (NHIS) and private insurers to design comprehensive coverage plans for road traffic crash victims.

Expected Outcomes: Comprehensive coverage plans will reduce the financial burden on crash victims, leading to higher rates of treatment and rehabilitation. This will result in better long-term health outcomes for victims.

Effectiveness: Medium to High. Improved insurance coverage ensures that victims receive necessary medical care without financial constraints, but the success depends on effective implementation and awareness among the public.

Recommendation Nr 4 - International Collaborations

1. Engage with international donors, NGOs, and government bodies to secure funding for facility expansion, equipment procurement, and training programs.

Expected Outcomes: Access to international funding, training, and advanced technologies will enhance the capabilities of emergency services and healthcare facilities. This will lead to better-equipped and better-trained personnel.

Effectiveness: High. International partnerships bring in essential resources and expertise that can significantly improve the quality of emergency response services.

Recommendation Nr 5 - Infrastructure Development

1. Advocate for improved road infrastructure and establish more localized fire stations to reduce response times.
2. Establish dedicated accident and emergency theatres adjacent to triage areas in major hospitals.

Expected Outcomes: Improved road infrastructure and localized fire stations will decrease response times and increase the accessibility of emergency services, particularly in remote areas.

Effectiveness: High. Infrastructure improvements are fundamental to reducing response times and ensuring timely access to emergency services.

Recommendation Nr 6 - Strengthening Equipment

1. Procure advanced extrication tools and medical equipment for the National Ambulance Service and fire brigades.
2. Invest in telemedicine and digital health solutions to improve patient care and data management.

Expected Outcomes: Advanced equipment will enable more effective extrication and medical interventions at crash scenes, improving the chances of survival and recovery for victims.

Effectiveness: High. Modern equipment is essential for effective emergency response and can significantly improve the outcomes for crash victims.

Recommendation Nr 7 - Specialist Training Programs

1. Develop specialist training programs in collaboration with academic institutions to increase the number of qualified emergency care professionals.

Expected Outcomes: An increase in the number of qualified emergency care professionals will improve the quality of care provided to crash victims, both at the scene and in medical facilities.

Effectiveness: High. Specialized training is crucial for maintaining high standards of care and ensuring that emergency personnel are equipped to handle complex trauma cases.

Recommendation Nr 8 - Enhanced Training and Certification

1. Implement regular, mandatory training programs for EMS, fire service personnel, and police focusing on Advanced Trauma Life Support (ATLS) and joint emergency response protocols.
2. Develop a certification program for trauma and emergency response, accredited by a national medical board or educational authority.

Expected Outcomes: Regular and mandatory training will ensure that all emergency responders are up-to-date with the latest practices and protocols. Certification programs will standardize the level of care across different services.

Effectiveness: High. Continuous training and certification ensure that responders maintain a high level of competency and can effectively manage emergency situations.

Recommendation Nr 9 - Community Training Programs

1. Implement community-based training programs in partnership with the National Road Safety Authority and educational institutions to empower bystanders with basic emergency skills.
2. Integrate basic emergency response training into school curricula and community programs, particularly in regions prone to accidents.

Expected Outcomes: Empowering bystanders with basic emergency skills will increase the chances of immediate care being provided at accident scenes, improving survival rates and outcomes.

Effectiveness: Medium to High. While community training can significantly improve immediate response, its effectiveness depends on the reach and quality of the training programs.

Recommendation Nr 10 - Operational Manuals and Guidelines

1. Update and standardize operational manuals across EMS, fire services, and police to include detailed protocols for coordination and scene management.
2. Create checklists for essential procedures at accident scenes to ensure quick and efficient response.

Expected Outcomes: Standardized protocols and checklists will lead to more consistent and efficient responses, reducing the likelihood of errors and improving the overall quality of care.

Effectiveness: High. Clear and standardized guidelines are essential for ensuring that all responders follow best practices and provide coordinated care.

Recommendations Nr 11 - Integrated Care Models

1. Develop integrated care models that link hospital services, rehabilitation centres, and community health workers to provide seamless follow-up care.

Expected Outcomes: Seamless transitions between different stages of care (from the scene to hospital to rehabilitation) will improve patient outcomes and reduce the risk of complications.

Effectiveness: High. Integrated care models ensure continuity of care, which is critical for the recovery and rehabilitation of crash victims.

Recommendation Nr 12 - Community Engagement

1. Launch public awareness campaigns on the proper use of emergency numbers and the importance of community first responders.
2. Develop community-based rehabilitation programs focusing on patient education and long-term support.

Expected Outcomes: Public awareness campaigns and community-based programs will increase the public's understanding of how to respond to emergencies, leading to quicker and more effective initial care.

Effectiveness: High. Public engagement is crucial for building a responsive community.

Recommendation Nr 13 - Technology Integration

1. Use technology, such as mobile apps, to streamline emergency call handling and reduce prank calls.
2. Enhance data-sharing practices among stakeholders to improve coordination and patient management.

Expected Outcomes: Streamlined emergency call handling and improved data sharing will enhance the efficiency and coordination of emergency responses. Reducing prank calls will free up resources for genuine emergencies.

Effectiveness: High. Technology can significantly enhance communication and coordination, making emergency response more efficient and effective.

3.2 Tanzania

3.2.1 Results from Interviews

National Referral and University Teaching Hospital in Tanzania

The summary of the results for the inquiry areas from Muhimbili National Hospital (MNH), emergency medicine department in Dar es Salaam, Tanzania is as follows:

- **Specialities Available 24/7 in the Emergency Department:** The hospital provides continuous access to several key medical specialities, including general surgery, neurosurgery, orthopaedics, traumatology, and other essential services such as laboratory and pharmacy services.
- **Training in Emergency Medicine for Doctors and Nurses:** Both doctors and nurses at Muhimbili Hospital have received training in emergency medicine. However, there is a need for more frequent training, particularly in Advanced Trauma Life Support (ATLS) for doctors and in both Primary Trauma Care and ATLS for nurses. Currently, training occurs once every two years, which is insufficient to keep up with updates in medical practices. Annual training is recommended to ensure that staff remains proficient and up-to-date.
- **Staff Availability for Road Traffic Crashes:** The hospital maintains a sufficiently trained staff available at all times to manage road traffic crash cases.
- **Coordination with Ambulance Services:** The emergency department maintains effective communication with ambulance services, receiving alert calls regarding seriously injured patients en route through a dedicated cell phone line at the department.
- **Triage and Resuscitation Facilities:** An effective triage system is in place, and the hospital has a dedicated resuscitation area that is sufficiently equipped.
- **Critical Bed Availability and Intensive Care Units:** The hospital has a sufficient number of critical beds and an adequately equipped Intensive Care Unit (ICU).
- **Data Collection and Sharing:** A standard data set is collected for each patient, but it is unclear whether this data is shared with other agencies or the effectiveness of such communication.
- **Critical Equipment and Services:** The hospital lacks several critical pieces of equipment crucial for effective post-crash care, including ultrasound machines, mechanical ventilators, ambulance bags, infusion pumps, blood warmers, and intubation kits.
- **Overall Condition of Emergency Department Facilities:** The emergency department facilities are considered to be in adequate condition by a hospital representative. However, the need for additional critical equipment and services significantly influences this assessment and remains a key area for improvement.
- **Bystander Training in Emergency Situations:** There appears to be a gap in the general public's ability to assist trauma victims at accident scenes, which highlights the need for targeted first aid training. Such training should focus on equipping the general population with the skills to help trauma patients at the scene of an accident. Special emphasis should

be placed on training specific groups, such as teachers, drivers, security personnel, and law enforcement officers. Providing these groups with this training can significantly improve emergency response effectiveness and potentially save lives.

EMS in Tanzania

The summary of the results for the inquiry areas from the interview with EMS associated with Muhimbili National Hospital in Tanzania is as follows:

- **Coverage and Operational Reach:** Muhimbili National Hospital's EMS serves as a public facility with a specific catchment area. Google Maps coordinate - <https://goo.gl/maps/btkSHyzLXfJNgHvbA>. Available response vehicles are two ambulances.
- **Staffing and Training:** The interview indicates various levels of staffing (basic, intermediate, advanced) and highlights the need for regular training updates, especially in trauma management. Training programs like Paramedic courses, BEC, and BNC were mentioned.
- **Response Protocols and Performance Indicators:** The EMS has standard operating procedures (SOPs) and key performance indicators for response times and patient management. However, the specifics of these protocols and indicators are not detailed in the interview.
- **Emergency Numbers and Public Awareness:** A national telephone number for emergency services is available, and regional referral hospitals have emergency services with trained staff. Public awareness of these services is implied but not explicitly discussed.
- **Equipment and Capabilities:** The EMS has two fully functional ambulances, but most lack advanced rescue equipment like 'The Jaws of Life', pneumatic spreaders and cutting equipment (also fire brigades lack it). Emergency personnel are trained in rescue techniques, but there's uncertainty about joint training exercises.
- **Challenges and Future Directions:** Need for more training and updates in trauma patient management.
- **Community Engagement and Training:** There's an acknowledgement of the need for training the public in first aid services, as most bystanders may not be able to provide adequate care due to a lack of knowledge and training.
- **Management and Assessment:** The ambulance service is managed by an in-charge and a team. The service and ambulances are regarded as being in very good condition by the interviewed representative. The service is government funded.
- **Collaborations and Accreditation:** Information not available.
- **Gender Representation and Future Personnel Development:** Information not available.

Emergency Plus Medical Services Tanzania Ltd

The summary of the results for the inquiry areas from the Emergency Plus Medical Services Tanzania Ltd, Tanzania is as follows:

- **Coverage and Operational Reach:** This is a private ambulance company operating in Dar es Salaam.
- **Staffing and Training:** The service employs six ambulance drivers, also known as ambulance operators, who are trained in BLS and Emergency Vehicle Operations. Additionally, there are six paramedics, all of whom are nurses with training in both BLS

and ACLS. The team also includes four emergency medical dispatchers, who are nurses trained in BLS and ACLS as well.

- **Response Protocols and Performance Indicators:** The service has documented standards of performance (SOPs) and operational key performance indicators for response times, on-scene times, travel to hospital times, and patient handover times.
- **Emergency Numbers and Public Awareness:** There are three dedicated emergency numbers which are accessible 24/7. Additionally, emergency medical dispatchers can do phone triage and give pre-arrival instructions to callers in distress.
- **Equipment and Capabilities:** The ambulances are fully equipped for trauma management, ensuring that they are ready to handle emergencies effectively. At the beginning of every shift, the on-duty paramedic conducts a thorough checklist inspection to confirm the presence and functionality of all equipment. Additionally, ambulance drivers, also known as operators, have their own checklist to ensure that the vehicle is in optimal condition at all times. The service currently has an initial fleet of 40 ambulances, with 4 currently in operation as the company is still in the setup phase. The overall condition of the ambulances is rated 10 out of 10, with all vehicles being uniform in terms of arrangement, stock, and quality.
- **Challenges and Future Directions:** The challenges include a lack of public awareness about ambulance services, making it difficult for people to utilize them when needed. Additionally, locating patients can be challenging due to inefficient communication from callers, which can delay response times. Furthermore, poor infrastructure in certain areas limits accessibility, making it difficult for ambulances to reach some locations.
- **Community Engagement and Training:** Bystanders are protected under the Good Samaritan Law, which encourages them to assist in emergencies without fear of legal repercussions. However, generally, there is a lack of essential training in BLS and First Aid for most of the bystanders. This indicates the need to provide training to equip individuals with the necessary skills to help victims while waiting for the ambulance to arrive. Additionally, bystanders can be engaged and receive pre-arrival instructions from medical dispatchers, enabling them to provide critical assistance until professional help reaches the scene.
- **Management and Assessment:** The service uses the customer relationship management system to store data pertaining to emergency responses. The data include time of the call and response time, patient details, responding crew and other emergency activities. In addition, each ambulance is equipped with a Patient Care Report (PCR) book. Patient details and interventions are recorded in this book. A signed copy of the report is then handed over to the receiving medical personnel upon patient transfer.
- **Collaborations and Accreditation:** The company participates in multi-agency rescue efforts during mass casualty incidents.
- **Gender Representation and Future Personnel Development:** Information not available.

Tanzania Fire and Rescue Force

The summary of the results for the inquiry areas from the Tanzania Fire and Rescue Force in Temeke, Dar es Salaam, Tanzania is as follows:

- **Staffing and Capacity:** The Fire and Rescue Force consists of four units/departments, each staffed differently. Firefighting has three shift groups of 11 personnel each (10 soldiers and 1 officer), totalling 33 staff. The Inspection unit has over 40 staff members distributed

across wards. The Rescue unit is divided into Marine (37 staff) and Buildings (7 staff). The public Education unit is managed by 3 personnel.

- **Response to Emergencies:** The Fire and Rescue Force operates with a response time of not more than 3 minutes from receiving a call. On-scene and travel times depend on specific conditions, including road and traffic circumstances. The unit is responsible for rescuing trapped victims in vehicle collisions and has pneumatic cutting equipment for such rescues.
- **Gender Dynamics:** Information not available.
- **Training and Development:** All fire service personnel receive basic training in rescue techniques. Training programs include Basic Life Support, Emergency Vehicle Operations, and Rescue Training, validated by the Tanzanian Government's Military. However, more advanced training is needed, especially for vehicle crash emergencies and operating rescue equipment.
- **Equipment and Resources:** The force has limited resources, with only one rescue vehicle and one fire engine. The fire engines and facilities are in fair condition, showing clear signs of significant wear and highlighting the urgent need for upgraded facilities and equipment. Equipment is generally inadequate to cover all duties effectively.
- **Collaboration and Coordination with Other Services:** Fire services in Dar es Salaam coordinate through the Inter-Agency Emergency Response Team in the Dar es Salaam Region (Known as "DarMAERT"), which oversees the region's emergency response. Data collected at incidents are shared with DarMAERT, ensuring a coordinated approach to emergency management.
- **Challenges and Recommendations:** Key challenges include inadequate equipment, poor infrastructure, lack of community awareness about accident response, and non-compliance with traffic rules. Recommendations highlight the need for more equipment, infrastructure improvements, and enhanced public education on emergency response.
- **Facility and Operational Conditions:** The facilities are in fair condition, exhibiting noticeable signs of wear and ageing. Operations are managed from a central dispatch centre, ensuring organized control over emergency responses.
- **Public Engagement and Communication:** The general public can access emergency services via the national telephone number 114. However, the interview highlights a need for better public awareness and training in basic emergency response.
- **Community Training and Emergency Response:** Many bystanders are not equipped to provide basic care before responders arrive. There is a recognized need for public training to enable bystanders to offer immediate assistance during emergencies, underscoring their duty of care.

Tanzania Police

The summary of the results for the inquiry areas from the Tanzania Police is as follows:

- **Response to Road Traffic Crashes:** In the event of a road traffic crash, the police are typically the first emergency service to arrive at the scene. The responsibility for rescuing victims trapped in vehicles falls to the Fire and Rescue Brigade. Although the guidelines for responding to road traffic crashes are deemed appropriate and implementable, there is a significant gap in the availability of necessary equipment, particularly for providing first aid. A standardized data set is collected for each incident attended by the police, and this data is shared with other relevant agencies to ensure a coordinated response.

- **Equipment and Training:** The traffic police force faces a critical shortage of proper vehicles, with normal police cars often being used as ambulances. The few standardized ambulance vehicles available are owned by hospitals or local government offices, leading to a lack of harmonization. While emergency service personnel, including police, fire, and ambulance teams, are trained in rescue techniques, there is no joint training among these groups, which could enhance coordinated response efforts. The training program includes extensive first-aid training and is conducted in collaboration with various stakeholders, such as the WHO and the Ministry of Health. Although the current training levels are considered adequate, there is a need for ongoing capacity building to ensure that personnel are up-to-date with the latest technological advancements.
- **Challenges and Coordination:** One of the main challenges in the emergency response system is the communication barrier among various stakeholders, such as nurses, doctors, and the Red Cross, which hampers coordination and the timely arrival of services at crash scenes. The police service facilities are considered to be only in fair condition, primarily due to the lack of specialized rescue vehicles. The service is funded by the government, with occasional support from donors. Additionally, there is a need for improved sharing of experiences and knowledge among stakeholders to enhance the overall effectiveness of emergency responses.
- **Community Engagement:** Community engagement is a vital component of the emergency response strategy, with initiatives in place to train residents along major highways in basic care and first aid. This training is currently being conducted from Dar es Salaam to Ruaha Iringa, aiming to equip bystanders with the skills necessary to provide basic care before emergency responders arrive.
- **Accident Black Spots:** Accident black spots are systematically identified, and the information is shared with organizations such as the UN and Japan International Cooperation Agency (JICA).
- **Improvement Opportunities:** There are several opportunities for improvement within the traffic police response system. Addressing the lack of standardized rescue vehicles and improving the availability of necessary equipment are top priorities. Enhancing communication channels among different emergency service stakeholders can lead to better coordination and more timely responses. Implementing joint training exercises for all emergency services could significantly improve overall efficiency and effectiveness. Additionally, increasing capacity-building initiatives will ensure that training programs remain current with the latest technology and best practices.

3.2.2 Stakeholder Analysis by Phase of Care

Care at the Scene

Stakeholders Involved: EMS (Emergency Medical Services), Tanzania Fire and Rescue Force, Tanzania Police, Bystanders and Community Members.

Current Capabilities

EMS (Emergency Medical Services):

- Muhimbili National Hospital's EMS serves a specific catchment area with two fully functional ambulances.
- The EMS employs staff at various levels (basic, intermediate, advanced) and emphasizes the need for regular updates in trauma management. Training programs like Paramedic courses, BEC, and BNC are offered.

Deliverable 6.2 'Post-crash response: Situation analysis and recommendations'

- Standard operating procedures (SOPs) and key performance indicators for response times and patient management are in place.
- A national emergency number is available, but public awareness needs improvement.

Tanzania Fire and Rescue Force:

- Consists of several units, including firefighting, inspection, rescue, and public education. The staffing is divided across these units, with the rescue unit having marine and building divisions.
- Aims for a response time of no more than 3 minutes from receiving a call, with specific conditions affecting on-scene and travel times.
- Equipped with pneumatic cutting equipment but lacks adequate resources, having only one rescue vehicle and one fire engine.

Tanzania Police:

- Police are typically the first emergency service to arrive at crash scenes, with responsibilities for initial response and coordination.
- Faces shortages in proper vehicles and equipment, often using standard police cars for transport. The training includes first aid but lacks joint training with other emergency services.

Bystanders and Community Members:

- There is a significant gap in bystander capabilities, highlighting the need for first aid training among frequent accident witnesses like teachers, drivers, and security personnel.

Needs and Challenges

- **EMS:** Requires more ambulances and advanced rescue equipment like 'The Jaws of Life' and pneumatic spreaders (in collaboration with fire brigades). Needs better public awareness and understanding of emergency services.
- **Fire and Rescue Force:** Lacks adequate resources and facilities. Requires more advanced training for vehicle crash emergencies and modern rescue techniques.
- **Police:** Faces critical shortages in rescue vehicles and equipment, affecting response capabilities. Needs joint training exercises with other emergency services for better coordination.
- **Bystanders:** There's an urgent need for community-based training programs to equip bystanders with essential first-aid skills.

Potential Partnerships

1. Collaboration with private ambulance services such as Emergency Plus Medical Services Tanzania Ltd and rescue equipment providers such as Pyramid Group can enhance capabilities and resource availability
2. Engaging with international NGOs and organizations like the WHO can provide training, funding, and advanced equipment for emergency response.
3. Universities and training centres can develop curricula for first aid and emergency response, providing ongoing education and research support.

Facility-Based Care

Stakeholders Involved: Muhimbili Hospital and Other Healthcare Facilities, Healthcare Professionals (Doctors, Nurses, etc.), EMS (Patient Transport and Coordination).

Current Capabilities of Muhimbili Hospital

- Provides continuous access to general surgery, neurosurgery, orthopaedics, traumatology, and other medical departments.
- Doctors and nurses receive training in emergency medicine, but there is a need for more frequent updates, especially in Advanced Trauma Life Support (ATLS).
- Effective communication with EMS for patient handovers is maintained through the department's cell phone.
- An effective triage system and dedicated resuscitation area are in place.
- Sufficient critical beds and an adequately equipped ICU are available.
- A standard data set is collected for each patient, but sharing practices with other agencies are unclear.

Needs and Challenges

- There's a need for more frequent training in ATLS for doctors and trauma care for nurses.
- The hospital lacks critical equipment such as ultrasound machines, mechanical ventilators, and intubation kits.
- The emergency department requires additional equipment and services.

Potential Partnerships

1. Partnering with private hospitals such as Aga Khan Hospital and Regency Medical Care for equipment sharing and specialized training can enhance capabilities.
2. Collaborations with organizations like WHO and NGOs can provide funding and expertise in trauma care.
3. Joint research initiatives with universities can lead to innovations in trauma care and continuous education programs.

Follow-Up Care

Stakeholders Involved: Hospitals and Rehabilitation Centres, National Health Insurance Fund (NHIF), Community Health Workers.

Current Capabilities

- **Hospitals and Rehabilitation Centres:** Provide ongoing care and rehabilitation for crash victims, though services vary by facility.
- **National Health Insurance Fund (NHIF):** Covers medical expenses for road traffic crash victims, but coverage gaps may exist.
- **Community Health Workers:** Play a vital role in follow-up care and patient education, especially in rural areas.

Needs and Challenges

- There is a need for more rehabilitation centres and services to support long-term recovery.
- Improving NHIF coverage to reduce out-of-pocket expenses for crash victims.
- Enhancing community health workers' capacity to provide follow-up care and education.

Potential Partnerships

1. Collaborating with existing rehabilitation centres such as Comprehensive Community Based Rehabilitation in Tanzania (CCBRT) to expand services and integrate holistic care approaches.
2. Engaging with organizations focused on rehabilitation and disability care can provide additional resources and expertise.
3. Working with NHIF and private insurers to improve coverage and reduce financial barriers for patients.

3.2.3 Recommendations for Tanzania and their Assessment

Recommendation Nr 1 - Training and Capacity Building

1. Implement joint training exercises to improve coordination and efficiency at crash scenes.
2. Develop training programs in partnership with international organizations and academic institutions to improve skills in trauma care.
3. Establish ongoing training programs in primary trauma care and advanced trauma life support for all medical and emergency personnel.
4. Organize annual training updates to ensure skills and knowledge are current and incorporate the latest practices and technologies.

Expected Outcomes:

- Improved coordination among EMS, Fire and Rescue, and Police at crash scenes.
- Faster and more efficient emergency response due to improved collaboration.
- Enhanced skill sets among emergency personnel, leading to better on-scene decision-making.

Evaluation:

- Effectiveness: High. Joint training will foster teamwork and understanding between different services, leading to more synchronized operations during emergencies. Streamlined operations can significantly reduce response times and improve the quality of care provided at the scene.

Recommendation Nr 2 - Community Engagement and Education

1. Develop community training initiatives in partnership with local organizations and educational institutions to empower bystanders with essential skills.
2. Develop targeted first-aid training programs for high-risk groups (e.g., drivers, teachers, security personnel).

Expected Outcomes:

- Increased community involvement in emergency response, empowering bystanders to assist effectively.
- Enhanced public awareness of basic first-aid skills, potentially reducing fatalities and complications from injuries.

Effectiveness: High. Community engagement and trained bystanders can provide immediate assistance, improving outcomes before professional help arrives.

Recommendation Nr 3 - Community and Institutional Capacity Building

1. Establish partnerships with local NGOs and international organizations for funding and knowledge exchange.

2. Implement community-based rehabilitation programs focusing on patient education and long-term support.

Expected Outcomes:

- Strengthened institutional frameworks through partnerships with NGOs and international organizations.
- Enhanced community resilience and long-term support for crash victims.

Effectiveness: High. Building capacity through strategic partnerships can significantly improve service delivery and sustainability. Leveraging resources and expertise from partners enhances the overall capability of emergency services.

Recommendation Nr 4 - Equipment Procurement and Upgrades

1. Engage with private sector partners and donors to acquire essential medical equipment like ultrasound machines, mechanical ventilators, and dedicated resuscitation areas in hospitals for enhanced patient care.
2. Enhance ambulance services (in cooperation with fire brigades) with necessary rescue equipment such as pneumatic spreaders and cutting tools.

Expected Outcomes:

- Improved patient care with access to modern medical equipment.
- Enhanced ability of emergency services to manage complex injuries effectively.

Effectiveness: High. Access to essential medical equipment can drastically improve treatment outcomes and reduce mortality rates. Well-equipped facilities and ambulances enable quicker, more effective interventions, optimizing resource utilization.

Recommendation Nr 5 - Infrastructure and Facility Improvements

1. Advocate for government and private sector investment in equipment and infrastructure to enhance response capabilities.
2. Develop integrated care models that link hospital services, rehabilitation centres, and community health workers to provide seamless follow-up care.

Expected Outcomes:

- Better-equipped facilities and integrated care models providing comprehensive follow-up care.
- Improved healthcare infrastructure supporting efficient patient management and recovery.

Effectiveness: Medium to High. Infrastructure improvements directly contribute to better patient outcomes and service delivery. Initial investments may be high, but long-term benefits include reduced strain on healthcare systems and improved patient flow.

Recommendation Nr 6 - Technology Integration

1. Utilize technology, such as mobile apps, to improve communication and coordination among emergency services and the public.

Expected Outcomes:

- Enhanced communication and coordination among emergency services and the public through mobile apps and technology.
- Faster dissemination of information, leading to quicker response times.

Effectiveness: High. Technology can significantly enhance communication, reducing delays and improving on-scene management. Streamlined information flow reduces redundancy and ensures resources are allocated where needed most.

Recommendation Nr 7 - Data Sharing Practices

1. Establish clear protocols for data sharing with relevant agencies to enhance coordination and patient management.

Expected Outcomes:

- Improved coordination and patient management through clear data-sharing protocols.
- Enhanced ability to track performance metrics and identify areas for improvement.

Effectiveness: Medium to High. Effective data-sharing requires robust systems and adherence to protocols. Proper data management can lead to better decision-making and optimized resource use.

Recommendation Nr 8 - Public-Private Partnerships

1. Leverage partnerships with private healthcare providers to improve resource allocation and infrastructure development.
2. Collaborate with NHIF and private insurers to design comprehensive coverage plans for road traffic crash victims.

Expected Outcomes:

- Increased investment and resource allocation from private healthcare providers.
- Improved infrastructure and service delivery through collaborative efforts.

Effectiveness: Medium to High. Public-private partnerships can provide the necessary funding and expertise, enhancing overall service quality. Coordination between public and private sectors may require initial adjustments but can lead to significant long-term gains.

Recommendation Nr 9 - International Collaboration

1. Partner with international organizations for training and capacity-building initiatives.

Expected Outcomes:

- Access to international expertise and training resources, leading to enhanced skills and knowledge.
- Strengthened healthcare systems through global best practices and innovations.

Effectiveness: High. International collaboration brings valuable insights and resources that can transform local healthcare systems. Partnering with international organizations ensures a continuous flow of knowledge and resources, improving service delivery.

Recommendation Nr 10 - Emergency Operation Manuals

1. Develop comprehensive emergency operation manuals for all hospitals and emergency services, including standardized patient handover procedures.

Expected Outcomes:

- Standardized procedures across hospitals and emergency services, leading to consistent and effective responses.
- Improved patient handover and management, reducing errors and delays.

Effectiveness: High. Clear operation manuals ensure uniformity in response, enhancing the overall quality of care. Standardized procedures minimize confusion and streamline operations, reducing response times and errors.

Recommendation Nr 11 - Performance Monitoring

1. Implement performance indicators for on-scene and travel times, with regular reviews to assess adherence and identify areas for improvement.

Expected Outcomes:

- Regular assessment of performance indicators leading to continuous improvement in response times and service quality.
- Identification of areas for improvement, enabling targeted interventions.

Effectiveness: Medium to High. Monitoring performance ensures accountability and drives improvements in service delivery. While monitoring requires resources, the insights gained can lead to more effective use of resources and better outcomes.

3.3 Zambia

3.3.1 Results from the Interviews

University Teaching Hospital in Zambia

The summary of the results for the inquiry areas from the University Teaching Hospital in Zambia is as follows:

- **Specialities Available 24/7 in the Emergency Department:** All doctors on-call are alerted and called to the hospital in case of need. There are occasional challenges with emergency trolleys.
- **Training in Emergency Medicine:** There is a need for comprehensive training, including all staff, even non-medical personnel like porters. Specific improvement is needed in resuscitation skills. Not all nurses have received training in emergency medicine, so regular drills could improve their proficiency.
- **Staff Availability for Road Traffic Crashes:** Inadequate staffing for road traffic crashes; when staff is unavailable, on-call doctors are alerted and called to the hospital.
- **Coordination with Ambulance Services:** Communication with ambulance services exists but is not always functional. The usual procedure involves alerting the central command. There is no standard documented procedure for clinical patient handover from ambulance crew to hospital staff.
- **Triage and Resuscitation Facilities:** A triage system is in place and is effective. There is a dedicated resuscitation area, but it's insufficient and occasionally lacks supplies.
- **Critical Bed Availability and Intensive Care Units:** The hospital does not have a sufficient number of critical beds. An intensive care unit exists but is not sufficient.
- **Data Collection and Sharing:** The hospital shares data with the central statistics office.
- **Critical Equipment and Services:** Issues with emergency trolleys and resuscitation area supplies suggest areas for improvement.
- **Overall Condition of Emergency Department Facilities:** The emergency department is functioning with a need for improvement in terms of real-time communications. Moreover, there is a need for drills on how to handle cases. The facilities, including the resuscitation area and ICU, are not sufficient to meet demand.

- **Bystander Training in Emergency Situations:** The responder believes that the bystanders have a duty of care and the necessary training in first aid and are able to provide basic care before professional emergency responders arrive.

Levy Mwanawasa Hospital Ambulance in Zambia

The summary of the results for the inquiry areas from the Levy Mwanawasa Hospital Ambulance, Zambia is as follows:

- **Coverage and Operational Reach:** The EMS is a public facility, operating with two staff members per shift across three different shifts to provide continuous coverage. However, the service seems to have limited operational reach with only one fully functional response vehicle.
- **Staffing and Training:** The service employs a minimal number of staff without clear differentiation in levels of care (basic, intermediate, advanced). The training for ambulance crew is local and not validated or accredited by any external organization, indicating potential gaps in the quality and consistency of training.
- **Response Protocols and Performance Indicators:** The EMS does not have documented standards of performance (SOPs) nor operational key performance indicators for response times, on-scene times, travel to hospital times, and patient handover times.
- **Emergency Numbers and Public Awareness:** There is a single national telephone number for emergency services, but the general public is not aware of how to request these services. Additionally, there are no dedicated emergency call centres with trained staff to provide first-aid advice over the telephone.
- **Equipment and Capabilities:** The EMS lacks standardized vehicle equipment and advanced rescue tools like 'Jaws of Life', pneumatic spreaders, or cutting equipment (also the fire brigade). The overall condition of the ambulances reflects these gaps, indicating that there is significant room for improvement.
- **Challenges and Future Directions:** The main challenges include limited public awareness, inadequate training and accreditation, lack of performance standards, insufficient equipment, and underdeveloped emergency response protocols.
- **Community Engagement and Training:** Bystanders are not able to provide basic care before emergency responders arrive. This indicates a need for community engagement and training to improve first-response capabilities at the incident scenes.
- **Management and Assessment:** The ambulance service is managed by a hospital, but there is no mention of a dedicated control room or systematic management and assessment procedures.
- **Collaborations and Accreditation:** Information not available.
- **Gender Representation and Future Personnel Development:** Information not available.

Zambia Fire Brigade

The summary of the results for the inquiry areas from the Zambia Fire Brigade is as follows:

- **Staffing and Capacity:** The fire brigade has a staffing strength of 186 personnel, serving the Lusaka District and surrounding areas. The facility is located at the Central Fire Station along Church Road.
- **Response to Emergencies:** The fire brigade often arrives first at the scene of road traffic crashes, along with the police, depending on communication. However, there are gaps in

the guidelines for responding to these crashes, and challenges such as distance from the fire station and road congestion hinder timely response.

- **Gender Dynamics:** Information not available.
- **Training and Development:** The level of training for emergency service personnel, including fire brigade staff, in rescue techniques is inadequate. There are no joint training exercises conducted with other emergency services like police or ambulance services.
- **Equipment and Resources:** The fire brigade faces a shortage of necessary equipment, specifically the lack of an ambulance to attend to road traffic accidents. This indicates a significant limitation in their operational capabilities.
- **Collaboration and Coordination with Other Services:** Information not available.
- **Challenges and Recommendations:** Key challenges include inadequate training, insufficient equipment, and difficulties in coordination and timeliness due to factors like distance and traffic congestion.
- **Facility and Operational Conditions:** The transcript does not provide detailed information about the facility's conditions or operational environment beyond its physical location.
- **Public Engagement and Communication:** The interview suggests a lack of public engagement and communication, particularly in educating bystanders on providing basic care in emergencies. There is an acknowledged need for bystander duty of care, but they lack the necessary training.
- **Community Training and Emergency Response:** The fire brigade recognizes the importance of bystanders in emergency situations but notes that they are not trained to provide basic care.

Zambia Police

The summary of the results for the inquiry areas from the Zambia Police is as follows:

- **Response to Road Traffic Crashes:** The Zambia Police, specifically the Road Traffic Accident Prevention Team (RTAP), is mandated to be the first to arrive at road crash scenes in the Lusaka Province. Their responsibilities include attending to casualties, clearing obstructions, recording eyewitness statements, and drafting a sketch of the crash site.
- **Equipment and Training:** The police force faces significant challenges with inadequate transport and shortages of essential equipment such as protective gloves, scene tapes, and first aid boxes. Traffic officers receive traffic management training upon recruitment, with periodic refresher courses. However, the training is considered very basic, necessitating further capacity building.
- **Challenges and Coordination:** Coordination issues, transport accessibility, manpower shortages, and communication constraints pose significant challenges to timely and effective crash scene management. These factors often delay emergency response, including police arrival.
- **Community Engagement:** The law encourages bystanders to assist at crash scenes by providing basic care and transporting injured persons to the nearest medical facility. This provision underscores the importance of community involvement in the initial emergency response.
- **Accident Black Spots:** The police have identified and marked accident-prone areas, known as 'Black Spots,' to alert drivers and prevent crashes.

- **Improvement Opportunities:** There are several areas for improvement, including enhancing the capacity and technical skills of officers, upgrading equipment, and improving coordination among emergency services. Additionally, expanding training to include advanced rescue techniques and conducting joint exercises with other emergency services could bolster the overall response to road traffic crashes.

3.3.2 Stakeholder Analysis by Phase of Care

Care at the Scene

Stakeholders Involved: Zambia Police, Zambia Fire Brigade, EMS (Levy Mwanawasa Hospital Ambulance), Bystanders and Community Members.

Current Capabilities

Zambia Police:

- The Zambia Police, particularly the Road Traffic Accident Prevention Team (RTAP), is mandated to be the first at crash scenes. They handle casualties, clear obstructions, and document the scene.
- The police have basic traffic management training but lack advanced skills and essential equipment, such as protective gloves, scene tapes, and first aid boxes. They also face transport challenges.

Zambia Fire Brigade:

- Often arrives first at crash scenes alongside the police. They face challenges due to distance from fire stations, road congestion, and lack of ambulances for attending to accidents.
- There is a significant shortage of equipment, which limits their operational capacity.
- The fire brigade lacks adequate training in rescue techniques and does not conduct joint training exercises with other emergency services.

EMS (Levy Mwanawasa Hospital Ambulance):

- Operates with limited reach due to one functional response vehicle and minimal staff.
- Lacks standardized equipment and advanced rescue tools like pneumatic spreaders and cutting equipment.
- There is low public awareness about EMS services and how to request assistance.

Bystanders and Community Members:

- Bystanders are encouraged to assist in emergencies, but there is a lack of formal training in basic first aid and emergency response, which limits their effectiveness.

Needs and Challenges

- **Zambia Police:** Need for protective gear and first aid supplies. Requires more comprehensive training in emergency management. Improved coordination with other emergency services is necessary.
- **Zambia Fire Brigade:** Critical need for ambulances and rescue equipment. Must engage in regular training and coordination with EMS and police.
- **EMS:** Increased awareness campaigns are needed to educate the public on EMS access and utilization. Requires more vehicles and staff for better operational reach.
- **Bystanders:** Community training programs in basic first aid and emergency response are essential.

Potential Partnerships

1. Collaborate with private ambulance services such as Zambia Red Cross, St John Zambia and SES Ambulance Services and equipment providers (mostly sourced outside Zambia) to enhance resources and capabilities.
2. Engage organizations like WHO Zambia (which has indicated readiness to provide training support), the Red Cross, and international NGOs for training support and equipment donations.
3. Partner with universities such as the University Teaching Hospital, APEX Medical University and Levy Mwanawasa Medical University for research and development of training programs in emergency response.

Facility-Based Care

Stakeholders Involved: University Teaching Hospital, Levy Mwanawasa Hospital Ambulance, Healthcare Professionals (Doctors, Nurses, etc.)

Current Capabilities

University Teaching Hospital:

- Offers 24/7 access to medical specialities, though there are challenges with emergency trolleys and resuscitation supplies.
- There is a need for comprehensive training, including resuscitation skills and drills for emergency preparedness.
- Communication with ambulance services exists but lacks functionality and standardized patient handover procedures.
- An effective triage system and dedicated resuscitation area are in place but need improvements.

Levy Mwanawasa Hospital Ambulance:

- Minimal staff without clear differentiation in care levels and training is not validated or accredited.
- Lack of documented SOPs and performance indicators for EMS operations.
- Lacks advanced rescue tools and standardized vehicle equipment.

Needs and Challenges

- **University Teaching Hospital:**
 - Needs regular training for all staff, including non-medical personnel, in emergency response.
 - Requires improvements in resuscitation supplies and emergency trolley availability.
 - Enhance coordination with EMS for efficient patient handovers.
- **Levy Mwanawasa Hospital Ambulance:**
 - Needs accreditation of training programs and development of SOPs for EMS operations.
 - Critical need for advanced rescue tools and additional ambulances.

Potential Partnerships

1. Collaborate with private hospitals such as Medland Health Services, Coptic Hospital, Victoria Hospital, Fairview Hospital, and Zambian Italian Orthopaedic Hospital for resource sharing and specialized training.
2. Engage organizations like WHO Zambia for training support and equipment donations.
3. Partner with universities such as the University Teaching Hospital, APEX Medical University and Levy Mwanawasa Medical University for research and development of training programs in emergency care.

Follow-Up Care

Stakeholders Involved: Hospitals and Rehabilitation Centres, National Health Insurance Scheme (NHIS), Community Health Workers.

Current Capabilities

- *Hospitals and Rehabilitation Centres:* Provide ongoing care and rehabilitation for crash victims, though services vary by facility.
- *National Health Insurance Scheme (NHIS):* Covers medical expenses for road traffic crash victims, but coverage gaps may exist.
- *Community Health Workers:* Play a vital role in follow-up care and patient education, especially in rural areas.

Needs and Challenges

- There is a need for more rehabilitation centres and services to support long-term recovery.
- Improving NHIS coverage to reduce out-of-pocket expenses for crash victims.
- Enhancing community health workers' capacity to provide follow-up care and education.

Potential Partnerships

1. Collaborating with existing centres such as Government hospitals and level one hospitals, Beit-CURE Children's Hospital of Zambia, and Zambian Italian Orthopaedic Hospital to expand services and integrate holistic care approaches.
2. Engaging with organizations focused on rehabilitation and disability care can provide additional resources and expertise.
3. Working with NHIS and private insurers to improve coverage and reduce financial barriers for patients.

3.3.3 Recommendations for Zambia and their Assessment

Recommendation Nr 1 - Joint Training Programs

1. Conduct joint training exercises for police, fire brigade, and EMS to improve coordination and efficiency at crash scenes.
2. Develop joint training initiatives between EMS, police, and fire services to foster a more coordinated response to accidents.

Expected Outcomes:

- Improved coordination and teamwork among police, fire brigade, and EMS, leading to faster and more effective responses at crash scenes.
- Reduced duplication of efforts and enhanced utilization of skills and resources during emergencies.

Effectiveness: High. Joint training fosters better communication and understanding among different emergency services, leading to more synchronized and effective operations. Coordinated training minimizes response time, reducing overlaps and improving the utilization of resources.

Recommendation Nr 2 - Comprehensive Training and Accreditation

1. Provide comprehensive emergency medicine training for all hospital staff, including non-medical personnel like porters.
2. Develop accredited training programs for EMS personnel in collaboration with international organizations and academic institutions.

Expected Outcomes:

- Enhanced skills and preparedness among hospital staff, leading to better patient care and management.
- Improved ability to handle emergencies effectively, reducing errors and improving patient outcomes.
- Higher quality of emergency medical services through standardized and accredited training.
- Increased professionalism and competency among EMS personnel, leading to improved patient outcomes.

Effectiveness: High. Comprehensive training ensures that all staff, including non-medical personnel, are equipped to manage emergencies efficiently. Accredited training programs raise the standard of care, ensuring EMS personnel are well-equipped to handle emergencies. Standardization leads to consistent care delivery, optimizing resource use and improving response efficiency.

Recommendation Nr 3 - First Aid and Emergency Response

1. Develop public education campaigns in collaboration with NGOs to train community members in basic first aid and emergency response.
2. Train community leaders and educators in basic life support and emergency care, empowering them to act effectively in crises.

Expected Outcomes:

- Greater community involvement in emergency response, with trained bystanders providing immediate assistance.
- Increased public awareness and preparedness for emergencies, potentially reducing fatalities and complications.

Effectiveness: Medium to High. Community training can significantly enhance the initial response, but its impact depends on the scale and reach of the programs. Empowered bystanders can provide immediate care, bridging the gap before professional help arrives and potentially saving lives. Training community leaders create local champions who can drive emergency preparedness and response initiatives. Community leaders can multiply the impact by training others and creating a network of knowledgeable first responders.

Recommendation Nr 4 - Equipment Procurement and Facility Upgrades

1. Engage with private sector partners and donors to acquire essential medical equipment for enhanced patient care.

2. Advocate for government and private sector investments in equipment and infrastructure to improve response capabilities.

Expected Outcomes:

- Improved patient care with access to modern medical equipment, leading to better diagnosis and treatment.
- Enhanced ability to manage complex injuries and emergencies effectively.

Effectiveness: High. Access to essential equipment can drastically improve treatment outcomes and reduce mortality rates. Well-equipped facilities enable quicker, more effective interventions, optimizing resource utilization.

Recommendation Nr 5 - Address Staffing Shortages

1. Address staffing shortages and infrastructure deficits in emergency services, including critical care facilities in hospitals.

Expected Outcomes:

- Increased staffing levels in critical areas, reducing workload and improving service delivery.
- Improved response times and quality of care through adequate staffing.

Effectiveness: Medium to High. Addressing staffing shortages ensures that emergency services are adequately equipped to respond effectively. While recruitment and training require resources, the long-term benefits include reduced burnout and improved service quality.

Recommendation Nr 6 - Essential Supplies

1. Improve the availability and accessibility of emergency trolleys and essential supplies in resuscitation areas.

Expected Outcomes:

- Better-equipped resuscitation areas with essential supplies readily available, improving emergency care.
- Reduced delays and improved patient outcomes through timely access to necessary equipment.

Effectiveness: High. Ensuring the availability of essential supplies enhances the ability to provide timely and effective care. Efficient supply management reduces waste and ensures that resources are available when needed.

Recommendation Nr 7 - Public-Private Partnerships

1. Leverage partnerships with private healthcare providers to improve resource allocation and infrastructure development.

Expected Outcomes:

- Increased investment and resource allocation from private healthcare providers.
- Improved infrastructure and service delivery through collaborative efforts and shared expertise.

Effectiveness: Medium to High. Public-private partnerships bring additional resources and expertise, enhancing the overall quality of care. Coordination between public and private sectors may require initial adjustments but can lead to significant long-term gains.

Recommendation Nr 8 - Technology Integration

1. Utilize technology to enhance communication and coordination among emergency services.

Expected Outcomes:

- Enhanced communication and coordination among emergency services through mobile apps and technology.
- Faster dissemination of information, leading to quicker response times and improved outcomes.

Effectiveness: High. Technology can significantly enhance communication, reducing delays and improving on-scene management. Streamlined information flow reduces redundancy and ensures resources are allocated where needed most.

Recommendation Nr 9 - Data Sharing Practices

1. Establish protocols for data sharing with relevant agencies to enhance coordination and patient management.

Expected Outcomes:

- Improved coordination and patient management through clear data-sharing protocols.
- Enhanced ability to track performance metrics and identify areas for improvement.

Effectiveness: Medium to High. Effective data-sharing requires robust systems and adherence to protocols. Proper data management can lead to better decision-making and optimized resource use.

Recommendation Nr 10 - Integrated Care Models

1. Develop integrated care models that link hospital services, rehabilitation centres, and community health workers to provide seamless follow-up care.

Expected Outcomes:

- Seamless transition between acute care and rehabilitation, providing continuous support for crash victims.
- Improved patient outcomes through coordinated care across different healthcare providers.

Effectiveness: Medium to High. Integrated care models ensure that patients receive comprehensive care, addressing both immediate and long-term needs. Implementation may be complex, but the holistic approach ensures comprehensive care, reducing the burden on individual services.

Recommendation Nr 11 - Community-Based Rehabilitation

1. Implement community-based rehabilitation programs focusing on patient education and long-term support.

Expected Outcomes:

- Long-term support for crash victims through community-based rehabilitation programs.
- Improved recovery outcomes through patient education and empowerment.

Effectiveness: Medium to High. Community-based programs provide valuable support, enhancing recovery and reducing the likelihood of complications. While resource-intensive,

the focus on patient education can lead to improved self-management and reduced reliance on healthcare services.

Recommendation Nr 12 - SOP Development and Dissemination

1. Create and disseminate detailed SOPs for emergency response, focusing on triage, resuscitation, and critical care management.

Expected Outcomes:

- Standardized response protocols ensuring consistency in care and reducing variability in service delivery.
- Improved patient outcomes through adherence to best practices and guidelines.

Effectiveness: High. Clear SOPs provide guidance and structure, enhancing the overall quality of emergency response. Standardized procedures minimize confusion and streamline operations, reducing response times and errors.

Recommendation Nr 13 - Community Training Guidelines

1. Develop a systematic approach to community training, emphasizing the role of bystanders in emergency care.

Expected Outcomes:

- Empowered community members capable of providing initial assistance and support during emergencies.
- Increased public engagement and participation in emergency response efforts.

Effectiveness: Medium. Community training can enhance the initial response, but its impact depends on the scale and reach of the programs. Effective guidelines can lead to significant improvements in community preparedness, enhancing overall emergency response capabilities.

Recommendation Nr 14 - Public Education Campaigns on Emergency Preparedness

1. Increase public awareness about emergency preparedness and the importance of timely and effective response through media and community outreach.

Expected Outcomes:

- Increased public awareness and preparedness for emergencies through media and community outreach.
- Enhanced community resilience and ability to respond effectively to crises.

Effectiveness: High. Public education campaigns are essential for building a supportive community. Effective outreach can lead to significant improvements in community preparedness, enhancing overall emergency response capabilities.

Recommendation Nr 15 - Community Leadership

1. Empower community leaders and educators to disseminate emergency care knowledge and skills.

Expected Outcomes:

- Empowered community leaders and educators capable of disseminating emergency care knowledge and skills.

Deliverable 6.2 'Post-crash response: Situation analysis and recommendations'

- Strengthened community networks supporting emergency response and recovery efforts.

Effectiveness: High. Empowerment initiatives create local champions who can drive emergency preparedness and response efforts. Community leaders can multiply the impact by training others and creating a network of knowledgeable first responders.

4 Cross-Country Learning Opportunities

Below strengths from Ghana, Tanzania, and Zambia are identified that provide the best avenues for cross-country learning in post-crash care. These examples highlight specific practices and systems that can be adopted or adapted by other countries to enhance their emergency response and healthcare services.

4.1 Ghana: 24/7 Availability of Specialists in Emergency Departments

Strengths:

- **Comprehensive Specialist Coverage:** Ghana's Trauma and Specialist Hospital in Winneba provides 24/7 access to a variety of specialists, including doctors, emergency nurses, and physician assistants. This ensures that trauma patients receive immediate and specialized care, leading to better outcomes.
- **Coordinated Response:** The hospital's system allows for a seamless response to emergencies, with specialists available at all times to handle complex cases and make critical decisions quickly.

Lessons for Other Countries:

- **Tanzania:** Although Muhimbili Hospital provides continuous access to various specialities, they can learn from Ghana by further optimizing staffing schedules and ensuring a more comprehensive range of specialists is available at all times.
- **Zambia:** The University Teaching Hospital can improve specialist availability by implementing a robust on-call system, ensuring specialists are ready to handle emergencies 24/7, similar to Ghana's model.

4.2 Tanzania: Effective Triage and Resuscitation Systems

Strengths:

- **Robust Triage System:** Muhimbili Hospital in Tanzania has an effective triage system that prioritizes patients based on the severity of their conditions, ensuring those in critical need receive immediate attention.
- **Well-Equipped Resuscitation Areas:** The hospital has dedicated resuscitation areas that are sufficiently equipped, allowing for rapid and effective treatment of trauma patients.

Lessons for Other Countries:

- **Ghana:** Hospitals in Ghana can benefit from adopting more sophisticated triage systems, ensuring that emergency departments are well-prepared to handle high volumes of trauma patients effectively.
- **Zambia:** Zambia's hospitals, particularly the University Teaching Hospital, can improve their resuscitation areas by learning from Tanzania's model, ensuring they are well-equipped and strategically located to provide immediate care.

4.3 Zambia: Community Engagement and Bystander Training

Strengths:

- **Legal Framework for Bystander Involvement:** Zambia has a legal provision that encourages bystanders to assist at crash scenes, highlighting the importance of community involvement in emergency response.
- **Emphasis on Duty of Care:** The country focuses on empowering bystanders with the knowledge and skills needed to provide basic care before professional responders arrive.

Lessons for Other Countries:

- **Ghana:** Ghana can enhance its community training programs by implementing legal frameworks similar to Zambia's, encouraging bystanders to actively participate in emergency situations.
- **Tanzania:** Tanzania can develop structured training programs for bystanders, focusing on high-risk areas and groups, drawing inspiration from Zambia's emphasis on community involvement.

4.4 Ghana: Coordination between Hospitals and Ambulance Services

Strengths:

- **Seamless Integration between Hospitals and Ambulance Services:** Ghana's hospital emergency departments maintain effective communication with ambulance services, ensuring smooth patient handovers and coordinated care.
- **Standardized Procedures:** In Ghana, established protocols for clinical patient handover from ambulance crews to hospital staff ensure that patients receive continuous care without unnecessary delays.

Lessons for Other Countries:

- **Tanzania:** While Muhimbili Hospital has some coordination, they can improve by implementing more standardized procedures for patient handovers, similar to Ghana's approach.
- **Zambia:** Levy Mwanawasa Hospital can learn from Ghana by developing clear protocols for ambulance-to-hospital transitions, ensuring seamless care for trauma patients.

4.5 Tanzania: Coordination and Collaboration Among Emergency Services

Strengths:

- **Integrated Emergency Response:** Tanzania's emergency services, including the Fire and Rescue Force, police, and ambulance services, coordinate effectively through systems like DarMAERT, ensuring a unified response to emergencies.
- **Use of Technology:** Tanzania utilizes dedicated communication lines and technology to maintain coordination among different emergency services, improving overall response times.

Lessons for Other Countries:

- **Ghana:** Ghana can enhance its emergency response by integrating services more closely, encouraging collaboration between fire, ambulance, and police services.

Deliverable 6.2 'Post-crash response: Situation analysis and recommendations'

- Zambia: Zambia can adopt a more integrated approach to emergency management, ensuring that different services work together seamlessly, drawing from Tanzania's model.

5 Conclusions

In light of the critical road safety challenges highlighted by the World Health Organization's Global Status Report on Road Safety 2023, this report underscores the urgent need for enhanced post-crash response systems in low- and middle-income African countries. Our analysis reveals that while there are ongoing efforts to address these issues, significant gaps remain, particularly in the coordination of emergency services, training of personnel, and community engagement.

Key recommendations include the development of joint training programs to improve coordination among emergency responders, the establishment of comprehensive training and accreditation for EMS personnel, and the implementation of community-based training initiatives to empower bystanders. Furthermore, public-private partnerships and international collaborations are essential to enhance resource allocation, infrastructure development, and the overall effectiveness of post-crash care.

It is imperative to acknowledge that the recommendations provided herein are preliminary. As the project progresses, ongoing developments and further analysis will likely necessitate adjustments and fine-tuning. The dynamic nature of road safety interventions requires flexibility and responsiveness to new insights and data. Therefore, the recommendations should be viewed as preliminary and subject to refinement as we advance toward our goal of creating safer road environments and more robust emergency response systems.

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