Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
1. Moller et al., 2018	• Not reported	• Non-ambulance transport is the main form of transport • There was no significant association between type of transport method (p=0.26), hospital arrival time (p=0.22), pre-hospital transport time (p-values=0.09) and post-trauma mortality	• Direct referral is the most common • Association with mortality not reported	• Not reported	• Not reported	• Not reported	Design: Retrospective Sample: 532 patients Country: South Africa	• Fisher's Exact test and Chi-square, continuous data by logistic regression and the Mann Whitney test.
2. Mohammed-Najeeb Mahama et al., 2018	• Post trauma mortality was 13%	• Transportation time was not significantly associated with survival. • Association with mortality not reported	• Not reported	• Not reported	• Not reported	• Not reported	Design: Retrospective Sample: 652 participants County: Ghana	• Multiple logistic regression analysis
3. Laura P. Boschini et al., 2016	• Not reported	• Pre-hospital time ranged between 1-14 hours • Ambulance transport was associated with post-trauma mortality [p<0.05] • Ambulance transport was most used in indirect referral pathway	• Direct referral is the most common • Mortality risk was highest in indirect referral • Direct referral was significantly associated	• Rescue was mainly by lay responders; relatives, friends or Good Samaritan • Association with mortality not reported	• Not reported	• Not reported	Design Retrospective Sample: 50,059 trauma patients County: Malawi	• Bivariate analysis

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			with a survival benefit [p=0.006]					
4. Isaac et al., 2014	• Not reported	• Transport mode was significantly associated with post-trauma mortality. • Mortality was significantly higher in road transport compared to air transport	• Not reported	• Not reported	• On-scene intubation rate [an ALS intervention] was significantly higher in air compared to ground emergency evacuation	• Not reported	Design: Retrospective Sample: 4596 patients Country: Kenya	• Multiple logistic regression analysis
5. Davies Adeloye, 2012	• Post trauma mortality is approximately 40% • Main cause of preventable mortality was be central nervous system (CNS) damage, excessive bleeding and compromised airway	• Not reported	• Not reported	• Not reported	• Not reported	• There is no national emergency health policy South Africa	Design: Literature review Country: Nigeria	• Review synthesis
6. Dominic et al., 2014	• 60% of post-trauma mortality was potential preventable	• Main cause of poor pre-hospital care and mortality were pre-hospital delays, delay in treatment, and inadequate fluid resuscitation • Association with mortality not reported	• Not reported	• Not reported	• Not reported	• Not reported	Design: Multidisciplinary Panel Review Sample: 231 trauma deaths. Country: Ghana	• Systematic analysis

Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
7. Kimuli et al., 2017	• Not reported	• Coordination was a key barrier to effective pre-hospital evacuation • There was no pre-defined EMS system in place • Association with mortality not reported	• Not reported	• Not reported	• Not reported	• Not reported	Design: A cross sectional study Sample: 459 patients Country: Uganda	• Principal Component Analysis
8. Edem et al., 2019	• Avoidable mortality was about 70% • Post-trauma mortality was approximately 30%	• Delay in seeking and receiving care was a key cause of avoidable mortality • Access to proper EMS transport and care critical cause of avoidable mortality • Association with mortality not reported	• Referral system was poorly organized and ineffective. It was characterised by miscommunications and few or no equipped ambulances • Association with mortality not reported	• Limited to no trained or skilled EMS providers at pre-hospital care level • Association with mortality not reported	• Not reported	• Not reported	Design: A retrospective & qualitative study Sample: 260 patients Country: South Africa	• Descriptive & • Thematic analysis
9. Kimuli et al., 2017	• Not reported	• Not reported	• Not reported	• Lay responders have insufficient rescue and first aid skills • Contextualized lay responder	• Not reported	• A national EMS policy or post-crash care system was available but implementation remained poor • Many trauma victims lacked health insurance to cover pre-hospital care	Design: Delphi study Sample: 12 experts participated Country: Uganda	• Delphi technique

Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
				training can effectively provide life-saving skills to first responders and improve patient survival • Association with mortality not reported				
10. Suryanto et al., 2017	• Not reported	• There are no well-organized EMS systems in place. • Transport was mainly through private vehicles • Ambulances are not properly equipped to provide quality evacuation. They are considered "transport vehicles" rather than "EMS vehicles" . Few ambulances had first-aid equipment only • In Morocco only three out of 15 ambulances were equipped with resuscitation equipment	• Not reported	• Not reported	• Not reported	• Not reported	Design: Literature review Country: Across Africa and other LMICs	• Review synthesis

Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
		• Association with mortality not reported						
11. Jimin Kim et al., 2017	• Not reported	• Few ambulances were available for use in patient transfer. Transport was mainly by private means • Facility-based ambulances have no basic equipment. They are common vehicles converted into makeshift ambulances • Interfacility referrals [indirect referrals] were transported using private vehicles • Association with mortality not reported	• No organized referral system in place • No properly defined referral protocols. Referral documentations was also limited • There was no pre-referral notification to referral facilities; no structured communication systems between facilities. • Referral forms were not standardized and their content varied widely • No referral feedback to	• Most lower level trauma care facilities are under-staffed; there are few skilled providers to provide life-saving interventions • Association with mortality not reported	• Not reported	• Most ambulances charged fee-for services. Few public facilities provided free ambulances services	Design: Cross-sectional Sample: A total of 62 health facilities Country: Liberia	• Univariate and bivariate analysis

Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
			lower facilities • Association with mortality not reported					
12. Menbeu Sultan et al., 2019	• Majority of trauma occurred at homes	• Non-ambulance transport was most common • Pre-hospital time was more than 60 minutes • Association with mortality not reported	• Not reported	• Rescue is mainly by untrained lay responders • There is minimal training of the Lay responders. Lay responder; training lay responders is an effective way of improving response at pre-hospital care level • Association with mortality not reported	• Not reported	• Not reported	Design: Cross-sectional Sample: 429 participants Country: Ethiopia	• Thematic analysis and chi-square • Multivariate logistic regression analysis
13. Andrew et al., 2018	• Not reported	• Not reported	• Not reported	• Not reported	• Not reported	• Pre-hospital care research and evidence is grossly lacking to guide development of resilient health system responses	Design: Literature review Country: Across	• Review synthesis

Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
14. Teresa et al., 2013	• Not reported	• There was no formal pre-hospital transport system in place Association with mortality not reported	• Patients were mainly transported to lower facilities prior to tertiary hospitals • Association with mortality not reported	• No skilled providers at pre-hospital care level; untrained lay responders were main providers of rescue services • Association with mortality not reported	• Not reported	• In Nigeria, no stable emergency communication system exists; no appropriate pre-hospital care structures and facilities. There was also no specific policy related to the establishment and operation of a pre-hospital trauma care system. Available health policy does not include pre-hospital system guidelines • In Ghana, health policy has limited pre-hospital care guidelines	• Systematic review • 30 studies • Country: South Africa	• Meta-analysis
15. Nichole et al., 2013	• Not reported	• Not reported	• Not reported	• Few trained practitioners are available for pre-hospital care system. Paramedics and trained nurses are rare. • Most ambulances have no	• Not reported	• Ambulances were underused due to financial costs, lack of awareness of the programme, lack of enabling infrastructure among others	Design: Qualitative Sample: 27 participants County: Gabon	• Thematic analysis

Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
				skilled providers on board; only un-trained drive is available • Only one out of three ambulance providers are trained in critical care for pre-hospital responses • EMS staff are inexperienced and overworked • Association with mortality not reported				
16. Kuzma et al. 2015	• Not reported	• Pre-hospital referral time ranged from one hour to several hours • Delays are common due to few ambulances and high transport costs • Association with mortality not reported	• Not reported	• Training of lay responders in EMS can provide positive rescue benefits • Association with mortality not reported	• Community-based response by trained lay people can improve trauma care outcomes • Association with mortality not reported	• Not reported	Design: a qualitative study Sample; 34 patients Country: Tanzania	• Thematic analysis

Author [s]	Post Trauma Mortality	Transport	Referral System	Providers	Interventions	Other Contextual Factors	Study Design, Sample Size and country	Statistical Analysis Methods used
17. Teri et al., 2012	• Not reported	• Not reported	• Not reported	• There are few to no trained emergency medical technicians • Association with mortality not reported	• Not reported	• Key barriers to emergency care included limited trauma data and case documentation, a lack of consensus on regionally appropriate metrics to facilitate impact and performance evaluation, and the lack of coordinated advocacy • Pre-hospital EMS system was not integrated into the formal health system	Design: Literature review Country: Tanzania	• Literature review

Table 2 Summary of Study Findings