

Scope-of-care and capacity assessment of global rural and remote pre-hospital trauma systems



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Background

- Traumatic injury burden disproportionately affects populations in resource-limited and low-and-middle income countries¹
- Access to well-defined trauma systems is critical to improving patient outcomes²
- Rural and remote populations often face additional increased geographic barriers to trauma care from a pre-hospital perspective^{3,4}
- There is a paucity in the literature regarding global availability of defined trauma services for these rural and remote populations

Objectives

- 1) To identify and describe pre-hospital services for rural and remote areas within defined trauma systems worldwide
- 2) To delineate commonalities in service patterns and identify objectives for further inquiry within the scope of trauma care for these populations

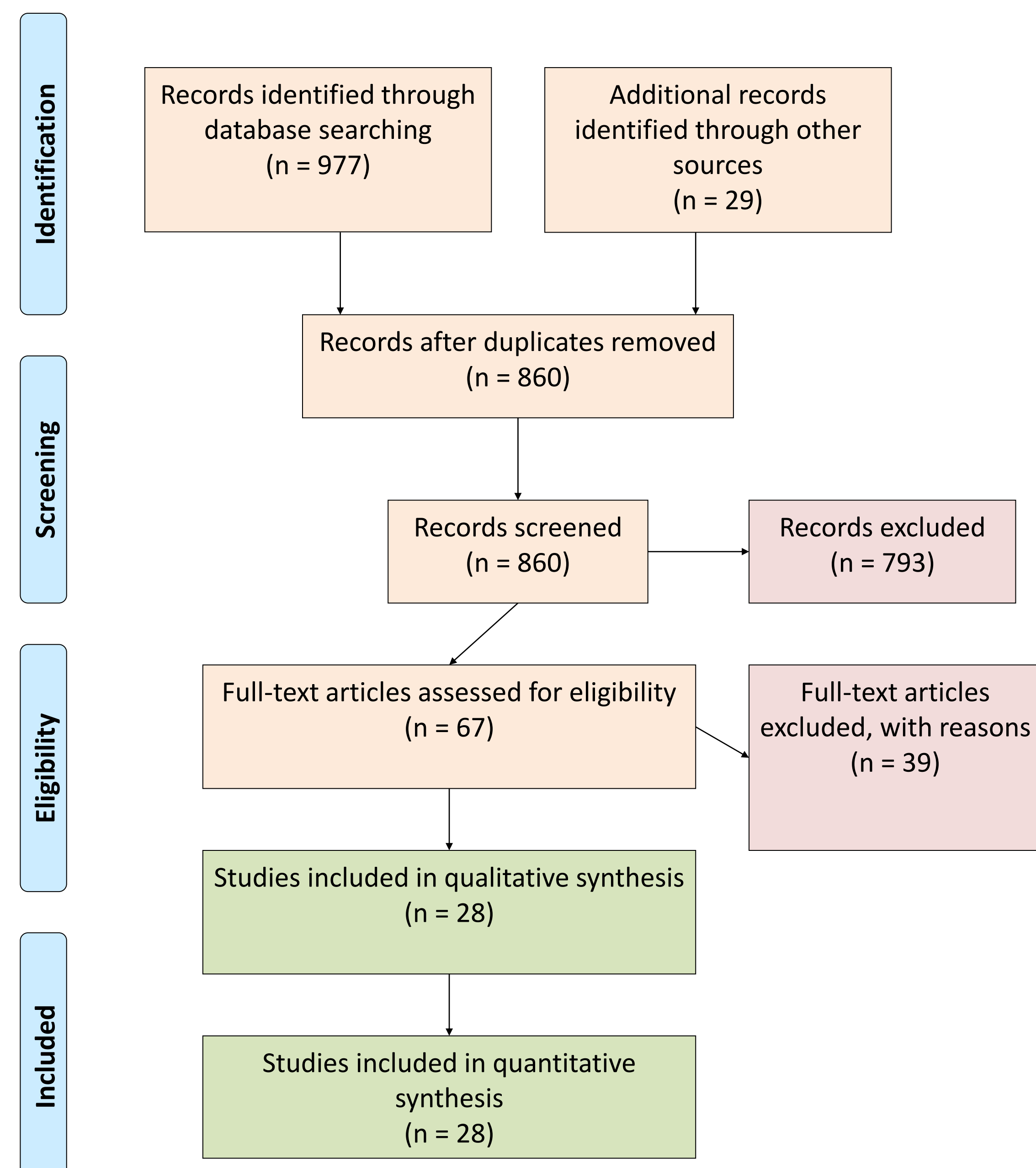


Fig. 1- PRISMA Systematic Review Flow Diagram

Methods

- This is a systematic review following PRISMA guidelines, articles and grey literature published in MEDLINE, EMBA and CINAHL databases between 2013-2023
 - *Included studies self-identified defined populations/regions as rural and remote (b HIC and LMIC), described a defined pre-hospital trauma system*
 - *Excluded studies were those outside of the defined timeframe, and military-specific research*
- All abstracts and manuscripts were assessed by two independent reviewers

Service Model	Definition
Community-Based Providers	Non-paramedicine community pre-hospital providers; community members who have completed training in emergency medical management and provide pre-hospital care in regions with limited access to EMS/Air Ambulance.
EMS	Emergency Medical Services: Pre-hospital teams staffed by paramedics, including Primary Care Paramedics, Community Paramedics, Advanced Care Paramedics, Critical Care Paramedics; ground transport via ambulance.
Air Ambulance	Includes both fixed-wing and helicopter transport. Pre-hospital teams are staffed by the flight team and Critical Care Paramedics.
Physician Staffed EMS and/or Air Ambulance	Emergency medical service/air ambulance teams which include physician staff. This denotes a wider scope of intervention in the pre-hospital environment.
Parkmedics	Park rangers with specialty medical training, similar to Advanced Emergency Medical Technicians and inclusive of expanded pharmacological and procedural skills.
Police	Police officers with training to provide basic emergency medical care, typically at first-aid level.
Search and Rescue	Pre-hospital providers with training specific to technical and medical skills needed for the extrication and treatment of injured persons in the wilderness.

Table 1- Definition of service models.

Service Models Described

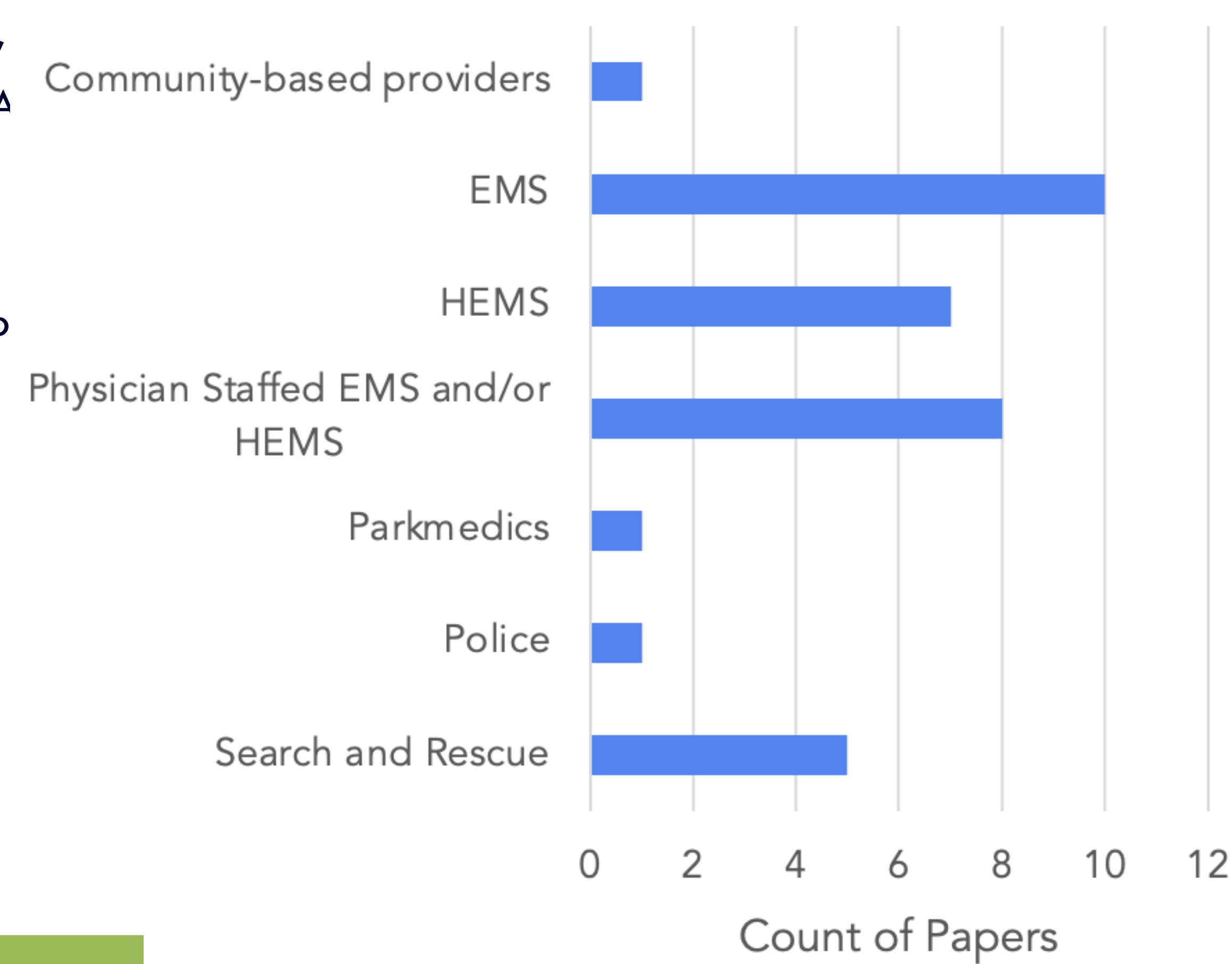


Fig.2- Described general service models for pre-hospital care in rural and remote settings

Results

Regional Representation

- Most studies reflected data from HICs (U.S., 58%; Australia, 25%; Canada, 17%)
- 4% of studies described pre-hospital care in LMICs (Kenya, 4%)

Transport and Available Services

- Helicopter (75%), and ground ambulance (53%) are the most commonly utilized transport models
- 32% (9/28) of papers describe defined triage criteria used for resource allocation/level of care/transport model decision-making
- 57% (16/28) of papers describe specialized care teams specific to these rural/remote environments
 - Ex. Parkmedics, Physician-staffed flight team, Community-based Emergency Care Providers

Discussion

- Air ambulance services represent a significant resource in the pre-hospital care pathways for trauma patients in rural/remote regions
- Specialized models for care provision, including task-sharing, advanced training, and ability for early intervention in the field, are key to pre-hospital care in these unique environments
- Communication abilities on-scene with providers at definitive care sites (Ex. Level 1 Trauma Centers) facilitates triage, management, and resource allocation

Conclusion and Future Directions

- Specialized advanced care teams that are contextually-specific are described as successful models for rural and remote pre-hospital care
- Limitations: As the scope of this study's search strategy focused on literature specific to rural and remote regions, this may eliminate some studies describing general cross-regional service models.
- Future work evaluating pre-hospital care task-sharing models and triage criteria is required to identify a translatable framework for care provision across multiple contexts

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