

Modernising of prehospital emergency care in low- to middle-income countries

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Emergency medical services (EMS) play a vital role in any country's healthcare system. While the healthcare system provides the overall management of healthcare delivery, a well-coordinated and functioning EMS delivering prehospital emergency care is a critical component of such systems, enabling a coordinated network of medical care that should be integrated into both public and private services (Bahadori and Ravangard, 2013; National Highways Traffic Safety Administration (NHTSA), 2023). While fully modernised EMS can be expected in high-income economies, the importance of delivering prehospital emergency care to international standards across low- to middle-income countries (LMICs) cannot be overstated. Supporting and enhancing EMS in such economies is not without challenges and is often under-examined in professional literature.

A fully functional EMS plays a vital role in reducing mortality, disabilities and improving community health and safety (Zieziulewicz, 1982; Bahadori and Ravangard, 2013; Mehmood et al, 2018; NHTSA, 2023). However, the effectiveness of prehospital emergency care in LMICs depends heavily on the supporting infrastructure. The World Health Organization (WHO), along with the United Nations (UN) and the Asian Development Bank (ADB), have been working across numerous projects to enable transformational change across LMICs in the delivery of prehospital emergency care. Examples of these include the 2018 WHO Emergency Care System Framework (ECSF) (Hirner et al, 2023), ADB's ongoing work for 'Supporting healthcare financial reform in Mongolia' (Jigjidsuren and Oyun, 2022), and the sustainable development goals by the UN to provide a global framework to improve healthcare outcomes (Delaney et al, 2025).

Historically, two main models of care have predominated in the out-of-hospital, prehospital emergency care setting:

- Franco-German model (FGM)
- Anglo-American model (AAM).

The FGM is very common in nearly all LMICs across Asia, Africa and former USSR States. Examples of the FGM found in high-income European countries include Germany, France, Greece and Austria. The second model, the AAM, is the primary model seen in almost all high-income countries outside of Europe with well-developed healthcare systems (Al-Shaqsi, 2010; Mills 2014; Dick 2003; McConnell et al, 2025). Examples of these countries include Canada, the UK, Australia, America and South Africa. The FGM is primarily physician-led ambulance response, with the AAM being primarily practice-led, such as paramedics, emergency medical technician (EMT), or a combination of both. The question of which model provides the best level of out-of-hospital prehospital emergency care response is a highly contentious one (Al-Shaqsi, 2010; McConnell et al, 2025), with studies by Zieziulewicz (1982), Arnold (1999), Dick (2003), Dib et al (2006) and Roudsari et al (2007), all reaching conflicting conclusions, thus rendering a comparison between the FGM and AAM models an unjustifiable exercise.

Prehospital emergency care response plays a critical role within any nation's healthcare system (Obermeyer et al, 2015; NHTSA, 2023). In the absence of this capability, healthcare systems encounter a myriad of challenges in addressing community needs (Razzak and Kellermann, 2002), resulting in increases in mortality and morbidity (Hirner et al, 2023), along with heightened demands on health resources during periods of elevated health service demand (Razzak and Kellermann, 2002;



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Prehospital emergency care must be delivered across low- to middle-income countries to international standards

Kironji et al, 2018; Hirner et al, 2023). Globally, 90% of all healthcare emergencies occur in LMICs, with paediatric and obstetric incidents, along with workplace accidents identified as the most frequent emergencies recorded (Lecky et al, 2020; Okonta et al, 2023). Lack of access to prehospital care and other health services has been identified by WHO and World Bank Disease Priorities Project as the cause of over half of all preventable deaths seen across LMICs (WHO, 2019; Lecky et al, 2020; Hirner et al, 2023).

For LMICs, a key focus of attention needs to be on how they can deliver basic healthcare, as well as prehospital emergency care response. In many LMICs, prehospital emergency care response is either managed entirely by local hospitals or health clinics, severely limited, or simply seen as cost-prohibitive and not implemented at all (Razzak and Kellermann, 2002; Roudsari et al, 2007; Aluisio et al, 2019; McConnell et al, 2025). Adding to this challenge, many Soviet-era European LMICs, after splitting from Russia, continued to operate with a Semashko model of care in place (Jigjidsuren and Oyun, 2022). This created further difficulties as they shifted from Soviet-led healthcare provision to independent,

nation-led systems (Jigjidsuren and Oyun, 2022; McConnell et al, 2025). In short, the challenges facing LMICs in providing prehospital emergency care are complex and multifaceted, requiring substantial support from local governments and international agencies to elevate standards of care and improve access across their populations and regions.

Although LMICs face a range of complex and multifaceted challenges as they work to improve prehospital emergency care response, those seeking to modernise their practices as part of a transition from Soviet-era forms of service delivery face a range of structural adjustments that are not trivial. Examples of research that are helping lead this change can be seen in the McConnell et al (2025) article recently published in *International Paramedic Practice*, 'Modernising prehospital emergency care in Mongolia: challenges and options'. This article focuses on research completed between 2018 and 2023, concluding with an observational study to identify key areas for development to improve prehospital emergency care within Mongolia. Agencies involved in this work include the Mongolian Ministry of Health, the National Emergency

Management Agency, the Mongolian Armed Forces and the Mongolian Society of Emergency Medicine. Each of these play a critical role in delivering prehospital emergency care in Mongolia. Findings from this research so far has identified three key areas:

- Training protocols and programmes implemented within leading agencies responsible for delivering prehospital emergency care in Mongolia were inconsistent and incomplete
- Variability existed in the comprehension of prehospital emergency care modernisation options in the Mongolian Healthcare System and associated emergency management response settings
- There were gaps in legislative and governance structures that support effective decisions supporting the modernisation of prehospital emergency care.

It is hoped that the data collected from this and ongoing research in this area can be implemented across other LMICs as they move towards modernising and transforming their prehospital emergency care response within their healthcare systems as well. **JPP**

Conflicts of interest: The author declares that there are no conflicts of interest.

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