COMMENTARY

Ten years of the community-based emergency first aid responder (EFAR) system in the Western Cape of South Africa: What has happened, what has changed, and what has been learned[☆,☆☆]

Marcus Slingers [a,b,*], Simonay De Vos [a,b], Jared H Sun, MD, PhD, MBA [c]

[a] *Western Cape Government College of Emergency Care*
[b] *Western Cape Government Health Emergency Medical Services*
[c] *University of Cape Town, Division of Emergency Medicine*

ARTICLE INFO

ABSTRACT

The emergency first aid responder (EFAR) system was designed as a low-cost and adaptable community-based pre-hospital emergency care system, and was first published after conducting a study in the township of Manenberg, South Africa, in 2010. EFARs are laypersons who are trained to respond to emergencies in their communities, and can provide support to the emergency medical services (EMS) by providing early clinical care, reporting back about the scene, and assisting with local scene management and logistics. Over the past ten years in South Africa, the Western Cape Government Health (WCGH) EMS and the Western Cape Government (WCG) College of Emergency Care have implemented the EFAR system in multiple communities and have trained over 10,000 community members across the Western Cape. This report is a ten-year update on what has happened since the EFAR system started, and to candidly show how the system has evolved, what has been learned, and what challenges remain so that others could look ahead and plan accordingly as they develop similar community-based first aid responder systems in resource-constrained areas. Core pillars to the EFAR system's success have included community involvement and adaptation, collaboration with the WCGH EMS and WCG College of Emergency Care, opportunities for community and EMS development, and emphasis on the sustainability of local EFAR systems. Multiple challenges also remain that others may likely face.

Introduction

In the ideal emergency medical services (EMS) setting, high priority emergencies should receive quick ambulance access, with the Western Cape Government Health EMS (WCGH EMS) having a response goal for its priority 1 emergencies at 15 minutes or less [1]. Such rapid response times are readily feasible in high income countries, but resource constraints in low- to middle-income countries (LMICs) make this almost impossible to consistently attain [2], especially in remote communities [3–5]. Furthermore, prehospital EMS must also adapt to the constantly changing dynamics of an area's unique local context and burden of care. One intervention to address these needs and strengthen healthcare systems is to prioritize training laypersons as first responders [5], and examples can be found today throughout the world [3,4,6–11]. Trained community-based first responders can rapidly respond to nearby emergencies and provide basic care supported by their expertise of their own

communities [5], and the African Federation for Emergency Medicine (AFEM) has also described such community-based systems as Tier-1 of a two tier out-of-hospital emergency care model important for community involvement, acceptance, and access to care [12].

The emergency first aid responder (EFAR) system was conceptualized in 2010 after conducting a study and pilot in Manenberg, South Africa, a township in Cape Town's Cape Flats region of the Western Cape that is known for high crime and violence rates [13]. Through the EFAR system, instructors trained local residents to be EFARs who could help secure a scene, guide bystanders and patients, communicate with EMS, and perform basic medical interventions to assist with emergencies in their communities. The introduction of EFARs into the EMS became a next step in expediting patient care and further integrating the region's healthcare system with the public [13]. Additionally, having community members trained with emergency skills helped empower and give a sense of ownership to those communities, and emulated the true mean-

---

Fig. 1. The original EFAR system model. EFARs can respond quickly to emergencies and care for patients until transportation is available. Local EFARs are spread throughout a community and can be activated by personal contact or alerted by a community-based Head EFAR. The matter in which Head EFARs and transporters were activated depended on the available resources of the area. (Reprinted) [15]. In the Western Cape, ambulances were the primary transporters, and the governing body was initially the University of Cape Town Division of Emergency Medicine before being taken on by the WCGH EMS in 2013.

ing of service delivery using the bottom-up approach, as has been seen elsewhere [7,10]. The ultimate vision of the EFAR system was to establish a vast network of EFARs, which neighbours could call upon when an emergency occurred [13].

After several pilots in the Western Cape, by 2013 the EFAR system was supported by the WCGH EMS and the Western Cape Government (WCG) College of Emergency Care. The original EFAR system model was designed to be a versatile framework that could be easily adapted to any region, and so as the EFAR system was scaled across the Western Cape it was also continuously adapted. After a decade of implementation, there were some changes but much of the original model remained, and the current Western Cape EFAR system continued to work on collaborative partnerships between community-based entities and EMS. As of today, the EFAR system has provided training for over 10,000 community volunteers, and has certified EFARs in over 100 communities throughout the Western Cape [14]. This report is a ten-year update on what has happened since the EFAR system started, and to candidly show what has been learned and what challenges remain so that others could look ahead and plan accordingly as they develop similar community-based first aid responder systems in resource-constrained areas.

The original EFAR system model

The EFAR system was developed as a versatile framework, intended to be easily adapted for any community in South Africa (Figs. 1–3)

[13,15]. Fig. 1 is the original EFAR response model from 2010, with EFARs being activated locally and by a central dispatch where possible, and EFARs can coordinate care with patient transporters (typically ambulances in the Western Cape) [15]. Fig. 2 is the original management structure of the EFAR system, which emphasizes using community-based organisations (CBOs) to locally manage the programme as much as possible [13]. CBOs are community level entities that had and today still have an integral purpose in sustaining the EFAR system at the local level, in part because community leaders and members understand their community's particular strengths and challenges and are thus better able to adapt the EFAR system for their own communities. Fig. 3 is the initial implementation strategy of the EFAR system as it expands to other regions, and it emphasizes consultation with community members for local adaptation, and stepwise implementation as resources allow. These figures and additional details about the original EFAR system model are further described and discussed in the previous articles from when the model was first published [13,15].

EFAR training and statistics (2010-2021)

Since training began, the EFAR system has worked with community members to make sure EFAR training methods and content were locally adapted to an area's medical needs, local practices, and available resources. The Western Cape's standard training consisted of four modules (scene management, unconscious patients, trauma, and medical emer-
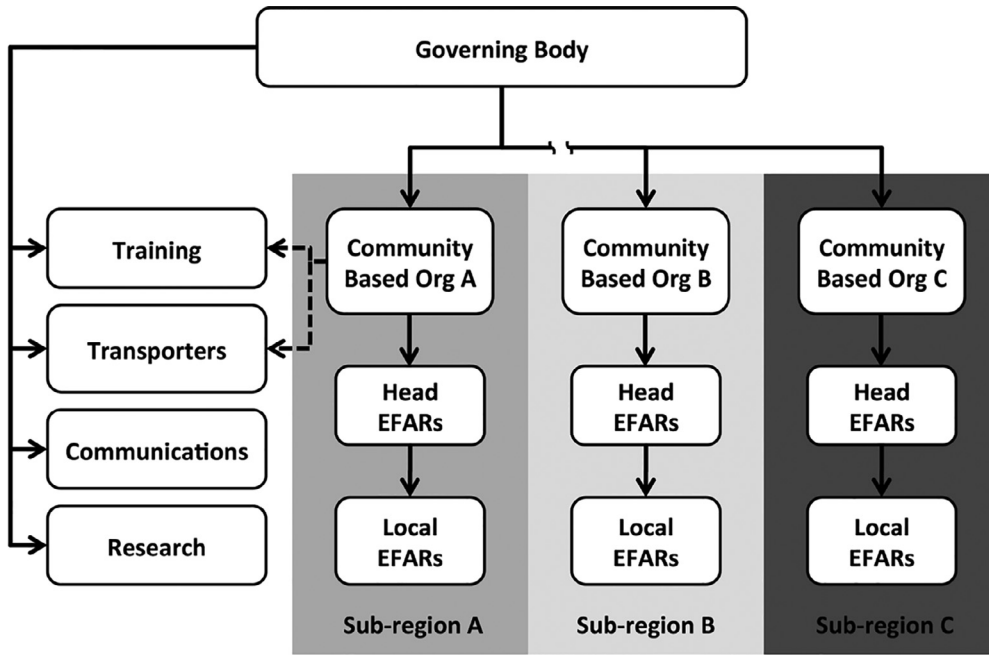
Fig. 2. Original management structure of the EFAR system. Community-based organisations (CBOs) and Head EFARs oversaw all EFARs in their respective regions, with the CBO having the ability to modify and run the system in their areas as needed to ensure local and cultural appropriateness. The governing body oversaw the CBOs for EFAR related matters, ensured the quality of the training and system, and handled matters that transcend single sub-regions such as communications and research. (Reprinted) [15]. In the Western Cape, ambulances were the primary transporters, and the governing body was initially the University of Cape Town Division of Emergency Medicine before being taken on by the WCGH EMS in 2013.
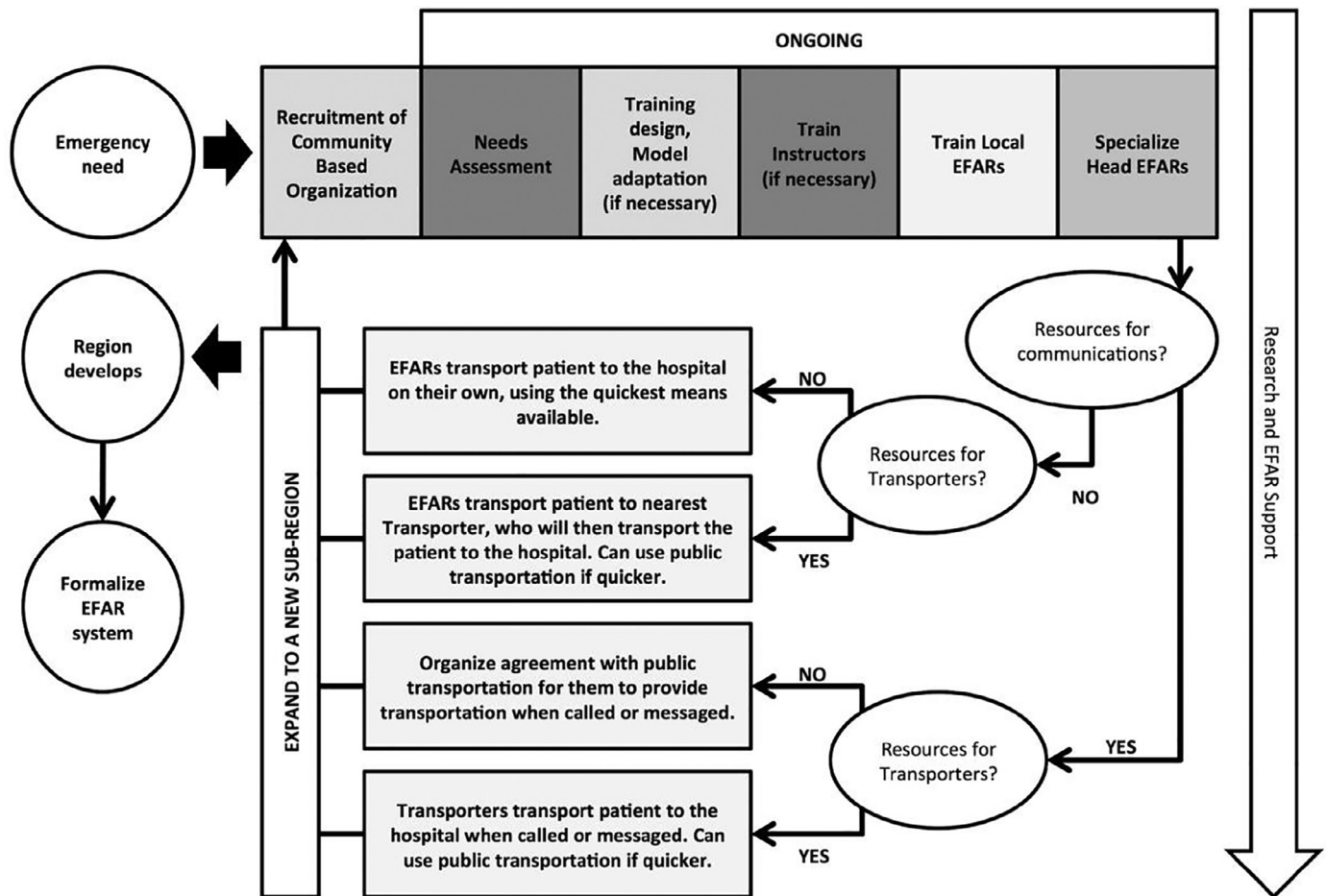

Fig. 3. Original strategy to implement the EFAR system. The needs assessment, training design, model adaptation, and training for instructors, EFARs, and transporters is ongoing for each sub-region even after an EFAR system is established there. Additionally, the organisation of communications and patient transport should be based on the available resources of the area, with sub-regions modifying their models as resources for communication and transportation become available. (Reprinted) [15]. In the Western Cape, transportation and communications were provided by the existing WCGH EMS wherever possible.
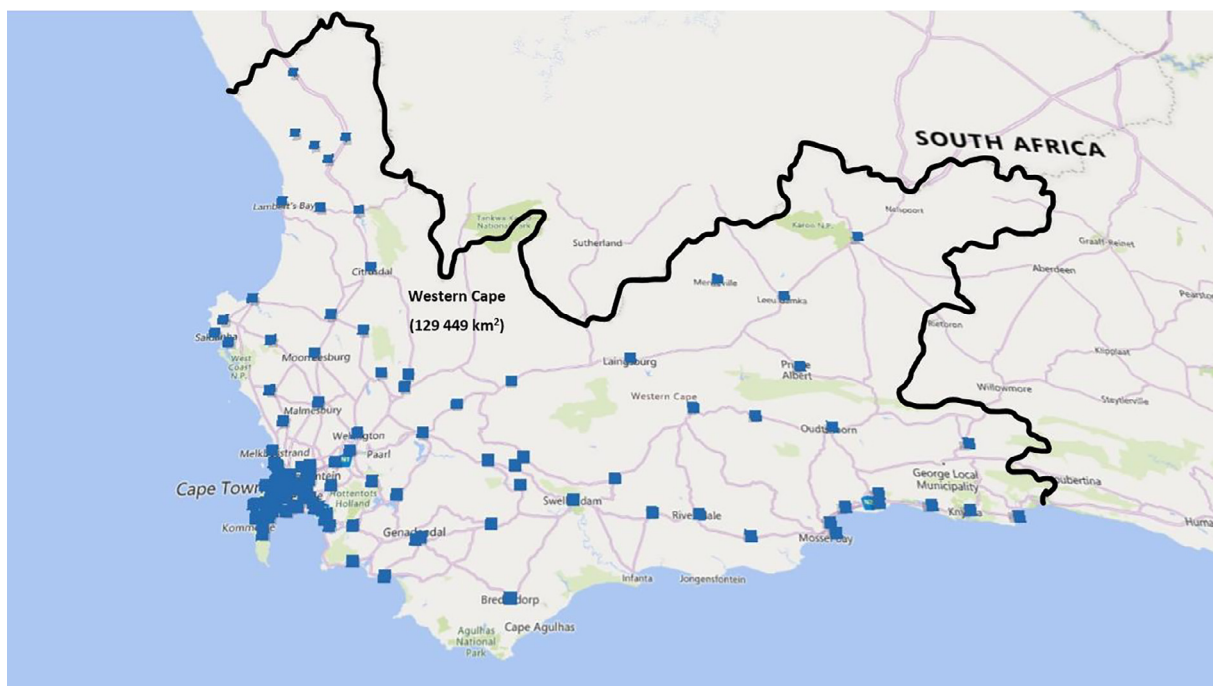
Fig. 4. Western Cape postal codes with EFARs certified from 2010 to 2021.
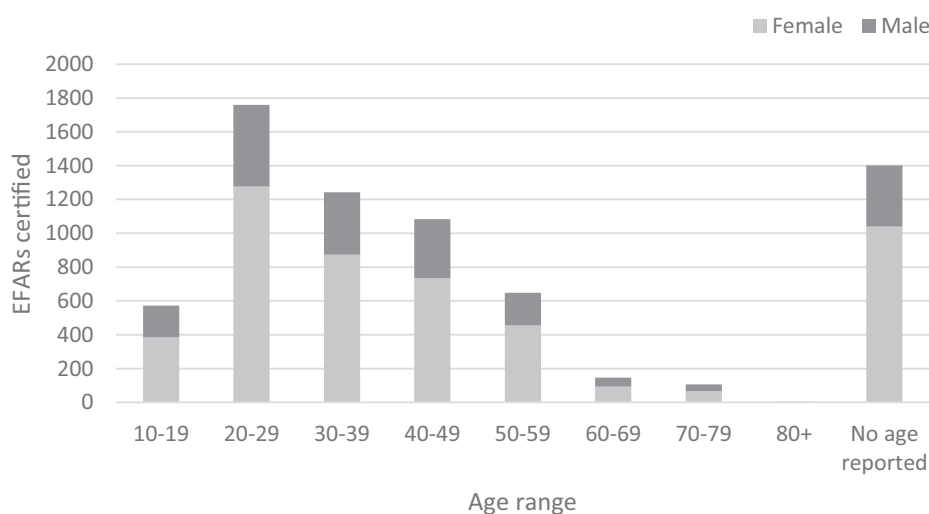

Fig. 5. Gender and age distribution of EFARs certified from 2010 to 2021 (total = 6,963).

gencies), and included skills such as scene safety, triage, CPR and airway control, bleeding control, splinting, identifying medical emergencies, and oral rehydration. The standard course took about 10 hours over one to two days to complete, included interactive lectures and group practicals with community leader involvement, and was followed by a written multiple choice and short answer assessment, live skill assessment, and group patient simulation. In 2021, mobile-phone based lectures and workshops were piloted due to social distancing during the COVID-19 pandemic. Upon training completion, EFARs received a renewable certificate and verifiable EFAR identity card recognizable by the WCGH EMS, and could receive bibs and hats with the EFAR logo to be used during emergencies.

From 2010 to 2021, 10,052 individuals across over 100 communities were trained in the Western Cape, with 6,963 (69.3%) passing and receiving EFAR certification (see Fig. 4 for geographic distribution). Amongst those receiving certification, 4,925 (70.7%) reported being female, 2,038 (29.3%) reported being male, and 4,084 (58.7%) reported an age from 20-49 at the time of certification (Fig. 5). Community lead-

ers were allowed to choose their most locally appropriate methods for recruitment, with no emphasis or restrictions on who was allowed to be trained. Trainees were also asked but not required to report their occupation, and recurring themes included homemakers, education, healthcare, and community workers.

Evolution of the Western Cape EFAR system– integration with EMS and the system in practice 10 years later

In 2013, the EFAR system was adopted by the WCGH EMS and the WCG College of Emergency Care. The province went further to appoint an EFAR Coordinator to manage the programme, and to serve as the communication link between the locally run EFAR systems and the greater EMS through regular meetings and as needed. This transition created an important bridge between the WCGH EMS and communities in the Western Cape.

As the EFAR system expanded across the Western Cape, the model adapted to incorporate regional EMS stations in managing their local
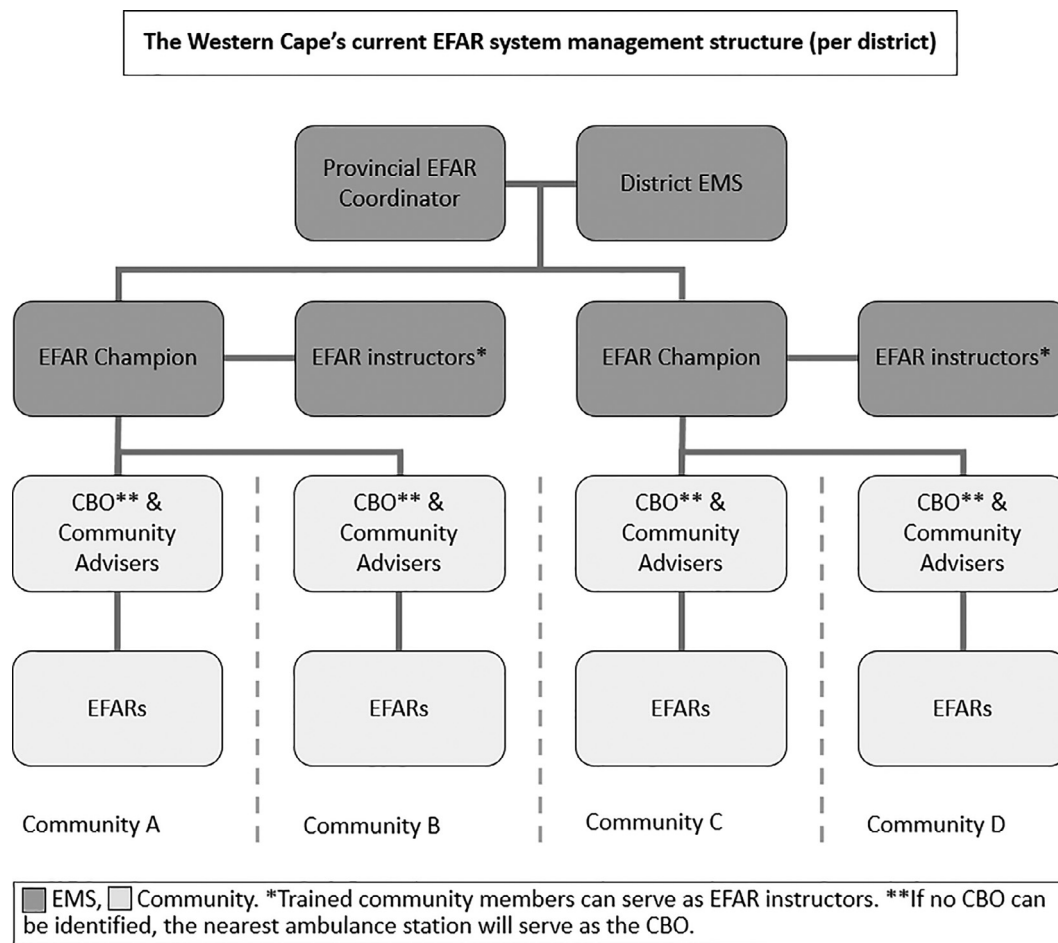
Fig. 6. The Western Cape's current EFAR system management structure using the integrated EMS stations. The local EFARs are supervised by a CBO and/or Community Adviser. The CBOs and Community Advisers are in contact with an EFAR Champion who is an EMS personnel from the district EMS. The EFAR Champions provide feedback to their district's EMS and the provincial EFAR office. EFAR Champions work with EFAR instructors to train EFARs, and can be EMS personnel or trained community members.

EFAR systems (Figs. 6 and 7). The Western Cape consists of EMS districts, and district EMS management began to help oversee their respective area's EFAR operations and training in three main ways. Firstly, each EMS district appointed EMS personnel as sub-regional EFAR Champions, who would correspond directly with and support the CBOs (local community-based organisations who would adapt and manage their community's EFAR system) and Community Advisers (community leaders serving as local and cultural guides). Secondly, EFAR Champions would also help perform training with EFAR instructors who could also be EMS personnel or be locally trained community members. Thirdly, if no CBO was available for a community, the nearest EMS ambulance station would serve as the CBO. In such cases, EMS especially sought the involvement of Community Advisers to help ensure that individuals living in the communities were involved with guiding their own local EFAR system. The whole EFAR system transitioned to this management structure in order to further integrate the EMS sectors with the management of their regional EFAR systems.

Fig. 7 illustrates how the coordinated EFAR system and greater EMS often play out today in the Western Cape, especially in the most rural and resource-constrained areas where locally embedded EFARs can be especially helpful to arrive first at the emergency scene to provide initial medical care and communicate between the scene and the rest of the EMS. In most impoverished areas, we have found that residents may be more familiar with or able to reach their neighbours than the EMS [13], and so EFARs are often their first contact with the emergency care system. In these instances, EFARs are then able to contact each other via their community's EFAR-only group messaging using platforms such as WhatsApp (data and privacy issues discussed later) and can use it to coordinate a response to the scene amongst themselves. Once on scene EFARs can provide care, call EMS dispatch if not already done, and remain as the communication link with EMS. Alternatively, if bystanders contact EMS dispatch concurrently or first, calls are often routed to a district call centre where dispatchers have access to a direct contact list of local EFARs provided by the EFAR Champions and can call the EFARs alongside or ahead of the ambulances who can then organize amongst themselves. If EFARs and ambulances are both responding, they can contact each other or have dispatch coordinate between them, and EFARs can be given instructions, can report back on the scene, and can even guide ambulances into the community or bring the patient to a pick-up point in areas without easy access.

Lessons learned: Core pillars of the Western Cape's EFAR system over the past 10 years

Collaboration between the official EMS and local community members

The collaboration between the EFARs and the rest of EMS has been a critical component of the EFAR system. The WCGH EMS has provided strategic oversight and central coordination, but cooperation with local residents has been helpful for the emergency care system to reach and navigate communities, and render care. For example, by being able to arrive on scene first [13], EFARs can also serve as an essential com-
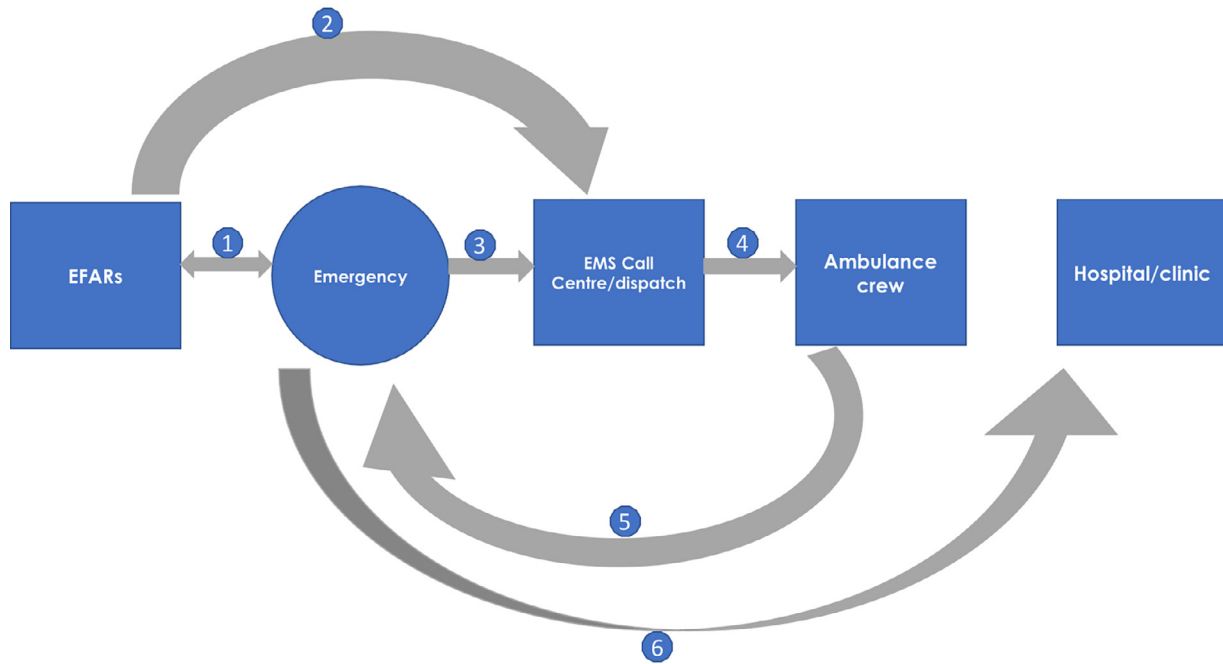
Fig. 7. The WCGH EMS in action with EFARs today. 1) Emergency occurs, bystanders can call EFARs for help, and the EFARs respond to the emergency scene to provide initial medical interventions to stabilize the patient's condition. 2) EFARs contact the EMS dispatch and provide information about the patient's location and condition, and EMS dispatch continues to communicate with the scene through the EFARs. 3) Emergency bystanders can also contact EMS dispatch directly if they know how and are able to. 4) EMS call centre dispatches an ambulance crew to the emergency. 5) The ambulance crew arrives on the scene or at a coordinated pickup point with EFARs. 6) The patient is transported to the nearest health facility.

munication link between the EMS and patients, can provide accurate information on patient location and condition, and can also give EMS insights into the nature of the community and the emergency scene. This bridge where the first responder serves as both emergency practitioner and community member to facilitate the emergency response has also been seen in other systems [4,6–8]. We suggest that for hard to reach communities, EMS in resource-constrained areas should consider relying on community first responders for access.

Additionally, community inclusion has facilitated not just the response but also local support and better community management of the EFAR system. We have observed that when local residents are included as EFAR instructors, or when they are often invited and included in local EMS activities, there is an increased sense of local ownership for the EFAR system, and a greater sense of confidence and camaraderie that has also been seen in other first responder systems [7,10]. Furthermore, this can be especially important in rural or resource-constrained areas, where the highest rates of volunteerism and altruistic motivation to be community responders have been observed [6,9–11].

Partnerships with community-based organisations and Community Advisers

Community-based organisations (CBOs) and Community Advisers have had a vital role in locally adapting the EFAR system, and strengthening the relationship between the EMS and communities. CBOs and Community Advisers are well-respected leaders in their communities, and can provide crucial insights into the needs of their own homes [13]. CBOs and Community Advisers have also been typically critical in the initial introduction of the EFAR system into a new community. They often have a strong footprint in their locations and can use this in the introduction and later sustainability of their local EFAR system. The list of what CBOs and Community Advisers have done for the EFAR system and the rest of the EMS is constantly growing. It has included public announcements, organising neighbours, procurement of affordable training venues and locally accessible resources, and navigating complex lo-

gistical, social, and cultural contexts. When issues arise for the EFAR system, more often than not, the CBOs or Community Advisers have a solution—or even simply their involvement increases public trust, which fixes the problem. We strongly suggest partnering with such local organisations and guides to establish any community-based response system.

Using the first responder system as a conduit for both community and EMS development

The EFAR system has also become instrumental in the personal development of EFARs and their communities, and also the EMS. For example, in 2018 the WCG College of Emergency Care established the Emergency Medical Care (EMC) learnership programme with the EFAR system. Through the EMC learnership programme, the WCGH EMS identified rural, marginalized communities in need of paramedics, and recruited EFARs from them to receive a bursary and accommodation to be paramedic trainees at the WCG College of Emergency Care. In 2019, the programme's first two students graduated, and they are now employed as paramedics in the rural communities they were recruited from. This is only one example of how the EFAR system has enabled local residents, communities, and the healthcare system to collaborate in the most resource-constrained locations. In other similar systems in resource-constrained areas, we suggest creating a pathway for development for community responders, who have also been shown to welcome feedback from more advanced practitioners [7,9]. Creating this pathway could not only also help the local community, but also come back to help the emergency care system.

Making first responder systems self-sustainable

EFAR systems are most needed where resources are the most constrained. So not surprisingly, the most successful EFAR systems have tended to be where the emphasis is placed on having as much self-sustainability as possible. In order to do this, resources and methods

should capitalize on what is already available, such as locally accessible supplies, existing relationships, or existing methods of logistics and operations. For example, EFARs reported better ability to provide care or coordinate responses when allowed to use materials and equipment they already had in their homes, or were already used to using. Additionally, communities were better able to conduct training when it was coordinated with already known and established healthcare training programmes, and involving known leaders and organisations in community health and safety. This self-reliance can not only ease the burden on the system, but gives local systems greater autonomy due to decreased external dependence and increased use of items and methods familiar to them [9,11].

Ongoing challenges, and recommendations

Metrics for measuring system impact on patient outcomes

Again, the EFAR system has been the most needed in regions that are the most resource-constrained. Unfortunately, this means that places where EFAR systems operate, are also places where data collection and keeping can be the most difficult. Similar systems have quantitatively and anecdotally measured a positive effect on patient outcomes to some degree [3,4], but to do so consistently and reliably can be extremely difficult. Ideally, the EFAR system would like to have more reliable data to measure its effectiveness and test how it can improve, and would welcome anyone who can help. Anecdotally though, people from EMS and communities have frequently and even dramatically vocalized a perceived benefit of the EFAR system. So, attempts are underway to perform a qualitative study to capture these sentiments in a methodical way. We suggest that when establishing any community responder system, very careful thought be given to data keeping, and such systems will likely have to share best practices with each other.

Communication and local coordination

Communication between the EFARs and the rest of EMS is important to coordinate an efficient emergency response. However, there are still significant shortfalls in EFAR communications—the lack or slow rollout of technology being one reason. So far though, what has been operationally successful is when communications are built on what the EFARs naturally do, such as how they naturally use the phones and messaging apps they already have, as opposed to forcing them to use equipment or a parallel system they are not used to. However, although EFARs have successfully used mobile chat platforms to organise emergency responses, this is a risk for patient privacy. To mitigate this, in response to security concerns a secure mobile application is being developed that builds upon what the EFARs are already using. Until it can serve as a reliable communications method, EFARs are trained to maintain patient privacy and only share information if clinically needed, to avoid using patient data where possible, and to eliminate patient data when no longer used. Regardless, communication remains a significant challenge, and other systems should consider piggybacking off of established community methods, but may also have to deal with issues of data privacy.

Maintaining support for different EFAR sites

At the community level, the EFAR system is run voluntarily, partly due to resource conservation and also due to the advice of CBOs and Community Advisers. Additionally, some of the work performed by EFAR Champions and EFAR instructors is in addition to their existing EMS duties. Because of these, the success of the EFAR system depends on the volunteered support of both community members and EMS personnel. An additional challenge to this is that CBOs are often non-profit organisations, and it can be difficult for them to adequately fund the programme on their own. Therefore, we suggest that both the CBOs and

the EMS share the costs in order to maintain a shared sense of contribution while also keeping the system sustainable.

Final words, and the future of EFAR

During the past ten years, as the EFAR system expanded it has continuously evolved to accommodate the Western Cape's changing needs of prehospital emergency care. Additionally, pilot studies in several African countries have shown the possibility of expanding EFAR or similar community responder systems to other LMICs. Essentially, the EFAR system has been and will continue to strive to provide as much benefit as possible, and to serve where it can as a foundation for prehospital emergency services in resource-constrained areas. To do this, as the EFAR system in the Western Cape and elsewhere grows, it will need continuous research and problem solving to ensure that it is effectively adapted to accommodate the needs of local communities. Furthermore, for the EFAR system in the Western Cape to continue to work, it likely must continue to prioritize and nurture all the core pillars of a sustainable community response previously mentioned, and success will continue to depend on the collaboration between communities and the EMS.

References

[1] "Emergency medical care. Western cape government.," 11 October 2021. [Online]. Available: https://www.westerncape.gov.za/general-publication/emergency-medical-care.

[2] Allgaier R, Laflamme L, Wallis L. Operational demands on pre-hospital emergency care for burn injuries in a middle-income setting: a study in the Western Cape, South Africa. Int J Emerg Med 2017;10:2. doi:10.1186/s12245-017-0128-9.

[3] Pattanarattanamolee R, Sanglun R, Nakahara S. Community-based first responder network in rural Thailand: a case study of out-of-hospital cardiac arrest. Prehospital Disaster Med 2021;36(2):234–6. doi:10.1017/S1049023X20001545.

[4] Hossain M, Hossain M, Mayaboti C, Rahman A, Chowdhury S, Mashreky S, Rhaman A. Impact of community-based first responder development for the management of drowning casualties in rural areas of Bangladesh. Afr J Emergency Med 2020;4(10):219–23 ISSN 2211-419X. doi:10.1016/j.afjem.2020.07.009.

[5] Kobusingye O, Hyder A, Bishai D, Hicks E, Mock C, Joshipura M. Emergency medical systems in low- and middle-income countries: recommendations for action. Bull World Health Organ 2005;83(8):626–31.

[6] Barry T, Guerin S, Bury G. Motivation, challenges and realities of volunteer community cardiac arrest response: a qualitative study of 'lay' community first responders. BMJ Open 2019;9:e029015. doi:10.1136/bmjopen-2019-029015.

[7] Heffernan E, McSharry J, Murphy and A, et al. Community first response and out-of-hospital cardiac arrest: a qualitative study of the views and experiences of international experts. BMJ Open 2021;11:e042307. doi:10.1136/bmjopen-2020-042307.

[8] Jayaraman S, Mabweijano J, Lipnick M, Caldwell N, Miyamoto J, Wangoda R, Mijumbi C, Hsia R, Dicker R, Ozgediz D. First things first: effectiveness and scalability of a basic prehospital trauma care program for lay first-responders in Kampala, Uganda. PLoS One 2009 Sep 11;4(9):e6955 PMID: 19759831; PMCID: PMC2736400. doi:10.1371/journal.pone.0006955.

[9] Phung V, Trueman I, Togher and F, et al. Community first responders and responder schemes in the United Kingdom: systematic scoping review. Scand J Trauma Resusc Emerg Med 2017;25:58. doi:10.1186/s13049-017-0403-z.

[10] Roberts A, Nimegeer A, Farmer J, Heaney D. The experience of community first responders in co-producing rural health care: in the liminal gap between citizen and professional. BMC Health Serv Res 2014;14:460 Published 2014 Oct 18. doi:10.1186/1472-6963-14-460.

[11] Phung V, Trueman I, Togher and F, et al. Perceptions and experiences of community first responders on their role and relationships: qualitative interview study. Scand J Trauma Resusc Emerg Med 2018;26:13. doi:10.1186/s13049-018-0482-5.

[12] Stein C, Mould-Millman N, De Vries S, Wallis L. Access to out-of-hospital emergency care in Africa: Consensus conference recommendations. Afr J Emergency Med. Volume 6, Issue 2016;3:158–61 ISSN 2211-419X. doi:10.1016/j.afjem.2016.08.008.

[13] Sun J, Wallis L. The emergency first aid responder system model: using community members to assist life-threatening emergencies in violent, developing areas of need. Emerg Med J EMJ 2012;29(8):673–8. doi:10.1136/emermed-2011-200271.

[14] "Whole of society approach to EMS emergencies. Western Cape Government.," 11 October 2021. [Online]. Available: https://www.westerncape.gov.za/news/whole-society-approach-ems-emergencies.

[15] Sun J, Shing R, Twomey M, Wallis L. A strategy to implement and support prehospital emergency medical systems in developing, resource-constrained areas of South Africa. Injury 2014;45(1):31–8 Jan. doi:10.1016/j.injury.2012.08.015.