Supplementary Material eTable 1. Baseline information on included articles.

Reference No	Primary Author	Citation	Country	WHO Region*	World Bank**	Location	Setting type*	* Setting**	Article ty	pe Methodolog	y Study year(s)	Participan numbers	t Participant type
1	Adewole	Adewole OA, Fadeyibi IO, Kayode MO, Giwa SO, Shoga MO, Adejumo AO, Ademiluyi SA. Ambulance services of Lagos state, Nigeria: a six-year (2001-2006) audit. West Afr I Med 2012;31:3–7	Nigeria	African	Low	Lagos State	Regional	Urban	Qual	Cross sectional	2001- 2006	32,774	Cases
2	Ahmed	Ahmed S, Adams AM, Islam R, Hasan SM, Panciera R. Impact of traffic variability on geographic accessibility to 24/7 emergency healthcare for the Urban poor: A GIS study in Dhaka. Bandladesh. PLoS One. 2019;14(9):e0222488.	Bangladesh 7	South-Eas Asia	stLower- middle	Dhaka	Regional	Urban	Quant	Cross sectional	2014	N/A	N/A
3	Ali	Ali M, Miyoshi C, Ushijima H. Emergency medical services in Islamabad, Pakistan: a public-private partnership. Public Health. 2006;120:50–7.	nPakistan	South-Eas Asia	stLower- middle	Islamabad	Regional	Urban	Qual	Mixed methods	2000- 2001	N/A	N/A
4	Alibhai	Alibhai A, Hendrikse C, Bruijns SR. Poor access to acute care resources to treat major trauma in low- and middle- income settings: A self-reported survey of acute care providers. Afr J Emerg Med. 2019;9(Suppl):S38-S42.	Multinational	African	N/A	N/A	International	N/A	Qual	Descriptive Survey	2016	392	Conference delegates
5	Amparo	Amparo ACB, Jayme SI, Roces MCR, Quizon MCL, Mercado MLL, Dela Cruz MPZ, Licuan DA, Villalon EES 3rd Baquilod MS, Hernandez LM, Taylor LH, Nel LH. The evaluation of Animal Bite Treatment Centers in the Philippines from a patient perspective. PLoS One. 2018 Jul 26:13(7):e0200873	Philippines ,	Western Pacific	Lower- middle	Nueva Vizcaya, Palawan and Tarlac Districts	Regional S	Both	Quant	Descriptive survey	2017	3537	Households
6	Anest	Anest T, Stewart de Ramirez S, Balhara KS, Hodkinson P, Wallis L, Hansoti B. Defining and improving the role of emergency medical services in Cape Town, South Africa. Emerg Med J. 2016;33(8):557-61.	South Africa	African	Upper- middle	Cape Town	Regional	Urban	Qual	Descriptive Interview	2013	24	Interviewed individuals
7	Anyumba	Anyumba G. Thohoyandou's central business district and the hypothetical accessibility challenges for emergency services Jamba. 2019:11(2):681.	eSouth Africa	African	Upper- middle	Thohoyandou	Regional	Urban	Qual	Cross sectional	2019	N/A	N/A
8	Aries	Ariës M, Joosten H, Wegdam H, van der Geest S. 2007. Fracture treatment by bonesetters in central Ghana: patients explain their choices and experiences. Tropical Medicine & InterNational Health 12(4): 564–574.	Ghana	African	Low	Brong Ahafo Region	Local	Urban	Both	Mixed methods	2005	46	Patients
9	Bachani	Bachani AM, Botchey I, Paruk F, Wako D, Saidi H, Aliwa B, et al. Nine-point plan to improve care of the injured patient: <i>i</i> case study from Kenya. Surgery. 2017;162(6S):S32-S44.	Kenya A	African	Lower- middle	Kenya	National	N/A	Qual	Cross sectional	2011	N/A	N/A
10	Bast	Bast HE, Jenkins JL. Challenges to Prehospital Care in Honduras. Prehosp Disaster Med. 2018;33(6):637-9.	Honduras	Americas	Lower- middle	Honduras	National	N/A	Qual	Descriptive Interview	2018	N/A	N/A
11	Bhopal	Bhopal SS, Halpin SJ, Gerein N. Emergency obstetric referral in Rural Sierra Leone: what can motorbike ambulances contribute? A mixed-methods study. Matern Child Health J. 2013:17:1038–43.	Sierra Leone	African	Low	Kambia region	Regional	Rural	Both	Mixed methods	2013	N/A	N/A

12	Bigdeli	Bigdeli M, Khorasani-Zavareh D, Mohammadi R. Pre- hospital care time intervals among victims of road traffic injuries in Iran. A cross-sectional study. Bmc Public Health. 2010-10	Iran	Eastern Mediterran ean	Upper- middle	Urmia, Iran	Regional	Urban	Quant	Cross sectional	2005- 2007	N/A	N/A
13	Broccoli	Brocoli MC, Calvello EJ, Skog AP, Wachira B, Wallis LA. Perceptions of emergency care in Kenyan communities lacking access to formalised emergency medical systems: a unalitative study. BMJ Open 2015;5(11):e009208	Kenya	African	Lower- middle	Kenya	National	N/A	Qual	Descriptive Interview	2015	528	Focus group members
14	Broccoli	Broccoli MC, Cunningham C, Twomey M, Wallis LA. Community-based perceptions of emergency care in Zambian communities lacking formalised emergency medicine systems. Emerg Med. J. 2016;33(12):870-5	Zambia	African	Lower- middle	Zambia	National	N/A	Qual	Descriptive Interview	2016	183	Focus group members
15	Burke	Burke TF, Hines R, Ahn R, Walters M, Young D, Anderson RE, et al. Emergency and urgent care capacity in a resource-limited setting: an assessment of health facilities in western Kenya. BMJ Open. 2014;4(9):e006132.	Kenya	African	Lower- middle	Western Kenya	Regional	Both	Qual	Descriptive Interview	2013- 2014	60	Key informants
16	Chunga	Chunga R, Bruijns SR, Hendrikse C. Access to acute care resources in various income settings to treat new-onset stroke: A survey of acute care providers. Afr J Emerg Med. 2019;9(2):77-80.	Multinational	N/A	N/A	N/A	International	N/A	Qual	Descriptive Survey	2016	382	Healthcare Providers
17	Comery	Comery B, Perry WRG, Young S, Dare A, Matalavea B, Bissett IP, Windsor JA. Delivery of surgical care in Samoa: perspectives on capacity, barriers and opportunities by local providers. ANZ J Surg. 2020 Oct;90(10):1910-1914.	Samoa	Western Pacific	Lower- middle	Samoa	National	N/A	Both	Descriptive Interview	2016	N/A	Key informants
18	Coyle	Coyle RM, Harrison HL. Emergency care capacity in Freetown, Sierra Leone: a service evaluation. BMC Emerg Med. 2015:15(1):2	Sierra Leone	African	Low	Freetown, Sierra Leone	Regional	Urban	Qual	Cross sectional	2015	N/A	N/A
19	De Wulf	DeWulf A, Otchi EH, Soghoian S. Identifying priorities for quality improvement at an emergency Department in Ghana BMC Emerg Med. 2017;17(1):28.	Ghana	African	Lower- middle	Urban Ghana.	Local	Urban	Qual	Descriptive Survey	5-Jul	18	EU staff members
20	De Wulf	De Wulf A, Aluisio AR, Muhlfelder D, Bloem C. Emergency Care Capabilities in North East Haiti: A Cross-sectional Observational Study. Prehosp Disaster Med. 2015;30(6):553-9.	Haiti	Americas	Low	Fort Liberté District, Haiti	Regional	Rural	Qual	Cross sectional	2012	N/A	N/A
21	El Tayeb	El Tayeb S, Abdalla S, Van den Bergh G, Heuch I. Use of healthcare services by injured people in Khartoum State, Sudan. InterNational Health. 2015;7(3):183-9.	Sudan	Eastern Mediterran ean	Lower- middle	Sudan	Regional	Urban	Qual	Descriptive Survey	2010	N/A	N/A
22	Elbashir	Elbashir K, Gore RJ, Abuaaraki T, Roblin P, Botha M, Yousit M, Ostrovskiys G, Bloem C, James SA. Prehospital emergency care and injury prevention in Sudan. Afr J Emerg Med. 2014;4:170–3.	f Sudan J	African	Low	Sudan	National	N/A	Qual	Cross sectional	2008 - 2014	N/A	N/A
23	Emerick	Emmerick IC, Luiza VL, Camacho LA, Ross-Degnan D. Access to medicines for acute illness in middle income countries in Central America. Rev Saude Publica. 2013;47(6):1069-79.	Multinational	Americas	N/A	Central American Countries	International	Both	Qual	Cross sectional	2013	2,761	Households
24	Hashtarkhan	i Hashtarkhani S, Kiani B, Bergquist R, Bagheri N, VafaeiNejad R, Tara M. An age-integrated approach to improve measurement of potential spatial accessibility to emergency medical services for Urban areas. Int J Health Plann Manage. 2020;35(3):788-98.	Iran	Eastern Mediterran ean	Upper- middle	Mashhad City, Iran	Regional	Urban	Quant	Cross sectional	2016	N/A	N/A

25	Hodkinson	Hodkinson PW, Pigoga JL, Wallis L. Emergency healthcare needs in the Lavender Hill suburb of Cape Town, South Africa: a cross-sectional, community-based household survey, BMJ Open, 2020;10(1):e033643	South Africa	African	Upper- middle	Lavender Hill suburb of Cape Town, South Africa	Regional	Urban	Qual	Descriptive Survey	2018	2754	Interviewed individuals
26	Hsia	Hsia RY, Mbembati N/A, Macfarlane S, Kruk ME. Access to emergency and surgical care in sub-Saharan Africa: the infrastructure gap. Health Policy Plan. 2012;27(3):234-44.	Multinational	African	N/A	Ghana, Kenya Rwanda, Tanzania, Uganda	, International	N/A	Qual	Cross sectional	2012	N/A	N/A
27	Jacobs	Jacobs B, Men C, Sam OS, Postma S. Ambulance services as part of the district health system in low-income countries: a feasibility study from Cambodia. InterNational Journal of Health Planning and Management. 2016;31(4):414-29.	Cambodia	South-Eas Asia	t Lower- middle	Cambodia	National	N/A	Qual	Descriptive Interview	2013	N/A	N/A
28	Khan	Khan AN, Rubin DH. 2003. InterNational pediatric emergency care: establishment of a new specialty in a developing country. Pediatric Emergency Care 19(3): 0181	Kosove	European Region	Upper- middle	Pristina University Hospital	Local	Urban	Qual	Cross sectional	2002	N/A	N/A
29	Khan	Khan A, Zafar H, Naeem SN, Raza SA. Transfer delay and in-hospital mortality of trauma patients in Pakistan. Int J Surg. 2010;8:155–8.	Pakistan	South-Eas Asia	t Lower- middle	Aga Khan University Hospital, Karachi	Local	Urban	Quant	Cross sectional	1998- 2005	N/A	N/A
30	Kirsch	Kirsch T, Hilwig W, Holder Y, Smith G, Pooran S, Edwards R. 1995. Epidemiology and practice of emergency medicine in a developing country. Annals of Emergency Medicine 26(3): 361–367.	Trinidad and Tobago	Americas	Lower- middle	Port of Spain,	Local	Urban	Qual	Descriptive Interview	N/A	N/A	N/A
31	Kumar	Kumar S, Chaudhary S, Kumar A, Agarwal AK, Misra MC. Trauma care - a participant observer study of trauma centers at Delhi, Lucknow and Mumbai. Indian J Surg. 2009;71:133- 41.	India s -	South-Eas Asia	t Lower- middle	Delhi, Lucknow, Mumbai	Regional	Urban	Qual	Cross sectional	2009	N/A	N/A
32	Levine	Levine AC, Presser DZ, Rosborough S, Ghebreyesus TA, Davis MA. Understanding barriers to emergency care in low- income countries: view from the front line. Prehosp Disaster Med. 2007;22(5):467-70.	Ethiopia -	African	Low	Tigray	Regional	Rural	Qual	Descriptive Survey	2006	N/A	N/A
33	Luo	Luo W, Yao J, Mitchell R, Zhang X. Spatiotemporal access to emergency medical services in Wuhan, China: accounting for scene and transport time intervals. Int J Health Geogr. 2020:19(1):52	China J	Western Pacific	Upper- middle	Wuhan	Regional	Urban	Quant	Cross sectional	2020	N/A	N/A
34	Macharia	Macharia WM, Njeru EK, Muli-Musiime F, Nantulya V. Severe road traffic injuries in Kenya, quality of care and access. Afr Health Sci. 2009:9(2):118-24.	Kenya	African Region	Lower- middle	Kenya	National	N/A	Qual	Cross sectional	1997- 1998	N/A	N/A
35	Mahmood	Mahmood KT, Amin F, Ayub H, Yaqoob M, Zaka M. Management of the patient from the site of accident to the hospital/ pre-hospital care. J Pharm Sci Res. 2010:2:804–8.	Pakistan	South-Eas Asia	tLower- middle	Pakistan	National	N/A	Qual	Cross sectional	2010	N/A	N/A
36	Mathew	Mathew A, Abdullakutty J, Sebastian P, Viswanathan S, Mathew C, Nair V, et al. Population access to reperfusion services for ST-segment elevation myocardial infarction in Kerala, India. Indian Heart J. 2017;69 Suppl 1(Suppl 1):S51- S6.	India	South-Eas Asia	t Lower- middle	Kerala	Regional	Urban	Quant	Cross sectional	2017	N/A	N/A

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37	Mock	Mock C, nii-Amon-Kotei D, Maier R. 1997. Low utilization of formal medical services by injured persons in a developing nation: health service data underestimate the importance of trauma. The Journal of Trauma: Injury, Infection, nd Critical Care 42(3): 504–513.	Ghana	African	Lower- middle	Ghana	National	N/A	Qual	Descriptive Interview	1995	21105	Interviewed individuals
38	Mock	Mock C, Ofosu A, Gish O. 2001. Utilization of district health services by injured persons in a Rural area of Ghana. The InterNational Journal of Health Planning and Management 16: 19–32.	Ghana	African	Lower- middle	Ghana	National	N/A	Qual	Descriptive Interview	1995	9442	interviewed individuals
39	Mock	Mock C, Nguyen S, Quansah R, Arreola-Risa C, Viradia R, Joshipura M. 2006. Evaluation of trauma care capabilities in four countries using the WHO-IATSIC Guidelines for essential trauma care. World Journal of Surgery 30: 946– 956.	Multinational	N/A	N/A	Mexico, Vietnam, India Ghana	International	N/A	Qual	Descriptive Interview	2006	N/A	N/A
40	Mohan	Mohan B, Bansal R, Dogra N, Sharma S, Chopra A, Varma S, et al. Factors influencing prehospital delay in patients presenting with ST-elevation myocardial infarction and the impact of prehospital electrocardiogram. Indian Heart J. 2018;70 Suppl 3(Suppl 3):S194-S8.	India	South-Eas Asia	tLower- middle	Punjab	Regional	Urban	Quant	Cross sectional	2015	619	Patients
41	Mould- Millman	Mould-Millman NK, Oteng R, Zakariah A, Osei-Ampofo M, Oduro G, Barsan W, et al. Assessment of Emergency Medical Services in the Ashanti Region of Ghana. Ghana Med J. 2015;49(3):125-35.	Ghana	African	Lower- middle	Ashanti Regior	Regional	Urban	Qual	Cross sectional	2012	N/A	N/A
42	Mould- Millman	Mould-Millman NK, Rominski SD, Bogus J, Ginde AA, Zakariah AN, Boatemaah CA, et al. Barriers to Accessing Emergency Medical Services in Accra, Ghana: Developmen of a Survey Instrument and Initial Application in Ghana. Glob Health Sci Pract. 2015;3(4):577-90.	Ghana t	African	Lower- middle	Accra	Regional	N/A	Qual	Cross sectional	2013	468	Survey participants
43	Mould- Millman	Mould-Millman NK, Dixon JM, Sefa N, Yancey A, Hollong BG, Hagahmed M, et al. The State of Emergency Medical Services (EMS) Systems in Africa. Prehospital and Disaster Medicine. 2017:32(3):273-83	Multinational	African	N/A	N/A	International	N/A	Qual	Cross sectional	2013- 2014	N/A	N/A
44	Nagata	Nagata T, Takamori A, Kimura Y, Kimura A, Hashizume M, Nakahara S. Trauma center accessibility for road traffic injuries in Hanoi, Vietnam. J Trauma Manag Outcomes. 2011:5:11.	Vietnam	South-Eas Asia	tLower- middle	Hanoi	Regional	Urban	Quant	Cross sectional	2006	N/A	N/A
45	Natuzzi	Natuzzi ES, Kushner A, Jagilly R, Pickacha D, Agiomea K, Hou L, Houasia P, Hendricks PL, Ba'erodo D. Surgical care in the Solomon Islands: a road map for universal surgical care delivery. World J Surg. 2011 Jun;35(6):1183-93.	Soloman Islands	Western Pacific	Lower- middle	Outer Islands	Regional	Rural	Quant	Cross sectional	2009- 2010	9	Health facilities
46	Nielsen	Nielsen K, Mock C, Joshipura M, Rubiano AM, Zakariah A, Rivara F. Assessment of the status of prehospital care in 13 low- and middle-income countries. Prehosp Emerg Care. 2012;16:381–9.	Multinational	N/A	N/A	13 LMICs in Africa, Asia, and Latin America	International	N/A	Qual	Descriptive Survey	2009– 2010	N/A	N/A
47	Ntabaye	Ntabaye MK, Scheutz F, Poulsen S. 1998. Household survey of access to and utilization of emergency oral health care services in Rural Tanzania. East African Medical Journal 75(11): 649–653.	Tanzania	African	Lower- middle	Rungwe district, Mbeya region	Regional	Rural	Qual	Descriptive Survey	1998	1,106	Households

48	Ouma	Ouma PO, Maina J, Thuranira PN, Macharia PM, Alegana VA, English M, et al. Access to emergency hospital care provided by the public sector in sub-Saharan Africa in 2015: a geocoded inventory and spatial analysis. Lancet Glob Health. 2018;6(3):e342-e50.	MutiNational	African	N/A	N/A	International	N/A	Quant	Cross sectional	2018	N/A	N/A
49	Phillips	Phillips G, Creaton A, Airdhill-Enosa P, Toito'ona P, Kafoa B, O'Reilly G, Cameron P. Emergency care status, priorities and standards for the Pacific region: A multiphase survey and consensus process across 17 different Pacific Island Countries and Territories. Lancet Reg Health West Pac. 2020 Aug:1:100002.	Multinational	Western Pacific	N/A	17 regional countries	International	N/A	Both	Descrriptive interviews & surveys	2018- 2019	17	Key informants
50	Pigoga	Pigoga JL, Joiner AP, Chowa P, Luong J, Mhlanga M, Reynolds TA, et al. Evaluating capacity at three government referral hospital emergency units in the kingdom of Eswatini using the WHO Hospital Emergency Unit Assessment Tool. BMC Emerg Med. 2020;20(1):33.	Eswantini	African	Lower- middle	Eswantini	National	N/A	Qual	Cross sectional	2018	11`	Key informants
51	Radjou	Radjou AN, Mahajan P, Baliga DK. Where do I go? A trauma victim's plea in an informal trauma system. J Emerg Trauma Shock. 2013;6:164–70.	India	South-Eas Asia	tLower- middle	Puducherry territory	Regional	Urban	Qual	Cross sectional	2009- 2010	N/A	N/A
52	Razzak	Razzak J, Cone D, Rehmani R. 2001. Emergency medical services and cultural determinants of an emergency in Karachi, Pakistan. Prehospital Emergency Care 5(3): 312–316.	Pakistan	South-Eas Asia	t Lower- middle	Karachi	Regional	Urban	Qual	Descriptive Interview	2001	N/A	N/A
53	Ro	Ro YS, Shin SD, Jeong J, Kim MJ, Jung YH, Kamgno J, et al. Evaluation of demands, usage and unmet needs for emergency care in Yaounde, Cameroon: a cross-sectional study. Bmj Open. 2017;7(2).	Cameroon	African	Lower- middle	Yaoundé	Regional	Urban	Qual	Cross sectional	2017	658	Households
54	Rocha	Rocha TAH, da Silva NC, Amaral PV, Barbosa ACQ, Rocha JVM, Alvares V, et al. Addressing geographic access barriers to emergency care services: a National ecologic study of hospitals in Brazil. Int J Equity Health. 2017;16(1):149.	Brazil	Americas	Upper- middle	Brazil	National	N/A	Quant	Cross sectional	2017	N/A	N/A
55	Rocha	Rocha TAH, da Silva NC, Amaral PV, Barbosa ACQ, Rocha JVM, Alvares V, et al. Access to emergency care services: a transversal ecological study about Brazilian emergency health care network. Public Health. 2017;153:9-15.	Brazil	Americas	Upper- middle	Brazil	National	N/A	Quant	Cross sectional	2017	N/A	N/A
56	Roy	Roy N, Murlidhar V, Chowdhury R, Patil SB, Supe PA, Vaishnav PD, Vatkar A. Where there are no emergency medical services-prehospital care for the injured in Mumbai, India. Prehospital Disaster Med. 2010;25:145–51.	India	South-Eas Asia	t Lower- middle	Mumbai	Local	Urban	Qual	Cross sectional	2005	170	Patients
57	Scolari	Scolari GAS, Rissardo LK, Baldissera VDA, Carreira L. Emergency care units and dimensions of accessibility to health care for the elderly. Rev Bras Enferm. 2018;71 Suppl†2:811-7.	Brazil	Americas	Upper- middle	Brazil	National	N/A	Qual	Descriptive Survey	2018	N/A	N/A
58	Sheikhbards i	sirSheikhbardsiri H, Esamaeili Abdar Z, Sheikhasadi H, Ayoubi Mahani S, and Sarani A. Observance of patients' rights in emergency department of educational hospitals in south- east Iran. International Journal of Human Rights in Healthcare. 2020; 13 (5):435-444.	Iran	Eastern Mediterran ean	Upper- middle	Kerman	Regional	Urban	Quant	Descriptive survey	2018	382	Patients

59	Sidaiqui	Siddiqui M, Siddiqui SK, Zafar A, Khan FS. Factors delaying hospital arrival of patients with acute stroke. J Pak Med Assoc. 2008:58:178–82.	Pakistan	South-Eas Asia	middle	Karachi	Local	Urban	Qual	sectional	2006- 2007	165	Patients
60	Sodemann	Sodemann M, Biai S, Jakobsen MS, Aaby P. Knowing a medical doctor is associated with reduced mortality among sick children consulting a paediatric ward in Guinea-Bissau, West Africa. Trop Med Int Health. 2006;11(12):1868-77.	Guinea- Bissau	African	Low	Guinea-Bissau	Local	Urban	Quant	Descriptive Interview	2001	1572	Patients
61	Sohayla	Sohayla M. Attalla, Feona AK Tema. Awareness and Accessibility of the Immigrants to the Healthcare Services in Shah Alam, Malaysia; A Pilot Study. European Journal of Molecular & Clinical Medicine, 7, 3, 2020, 5396-5404.	Malaysia	Western Pacific	Upper- middle	Shah Alam	Local	Urban	Quant	Descriptive survey	2020	300	Survey participants
62	Stein	Stein C, Mould-Millman NK, De Vries S, Wallis L. Access to out-of-hospital emergency care in Africa: Consensus conference recommendations. Afr J Emerg Med. 2016;6(3):158-61.	MutiNational	African	N/A	N/A	N/A	N/A	Qual	Cross sectional	2015	N/A	N/A
63	Sultan	Sultan M, Abebe Y, Tsadik AW, Ababa A, Yesus AG, Mould- Millman NK. Trends and barriers of emergency medical service use in Addis Ababa; Ethiopia. BMC Emerg Med. 2019;19(1):28.	- Ethiopia	African	Low	Ethiopia	National	N/A	Qual	Cross sectional	2017	429	survey participants
64	Suriyawongp aisal	Suriyawongpaisal P, Atiksawedparit P, Srithamrongsawad S Thongtan T. Closing the Equity Gap of Access to Emergency Departments of Private Hospitals in Thailand. Emerg Med Int. 2018;2018:6470319.	,Thailand ⁄	South-Eas Asia	t Upper- middle	Thailand	National	N/A	Quant	Cross sectional	2017	20,206	patients
65	Suriyawongp aisal	Suriyawongpaisal P, Aekplakorn W, Srithamrongsawat S, Srithongchai C, Prasitsiriphon O, Tansirisithikul R. Copayment and recommended strategies to mitigate its impacts on access to emergency medical services under universal health coverage: a case study from Thailand. BMC Health Serv Res. 2016;16(1):606.	Thailand	South-Eas Asia	t Upper- middle	Thailand	National	N/A	Qual	Mixed methods	2012	N/A	N/A
66	Tansley	Tansley G, Schuurman N, Amram O, Yanchar N. Spatial Access to Emergency Services in Low- and Middle-Income Countries: A GIS-Based Analysis. PLoS One. 2015:10(11):e0141113	Multinational	N/A	N/A	N/A	International	N/A	Quant	Cross sectional	2015	N/A	N/A
67	Tansley	Tansley G, Stewart B, Zakariah A, Boateng E, Achena C, Lewis D, et al. Population-level spatial access to prehospital care by the national ambulance service in Ghana. Prehosp Emerg Care 2016;20(6):768-75	Ghana	African	Lower- middle	Ghana	National	N/A	Quant	Cross sectional	2016	N/A	N/A
68	Thomson	Thomson N. Emergency medical services in Zimbabwe. Resuscitation. 2005;65(1):15-9.	Zimbabwe	African	Lower- middle	Zimbabwe	National	N/A	Qual	Cross sectional	2005	N/A	N/A
69	Treleaven	Treleaven E, Pham TN, Le DN, Brooks TN, Le HT, Partridge JC. Referral patterns, delays, and equity in access to advanced paediatric emergency care in Vietnam. Int J Equity Health. 2017;16(1):215.	Vietnam	Western Pacific	Lower- middle	Hanoi	Local	Urban	Quant	Cross sectional	2013	557	Patients
70	Vanderschur en	Vanderschuren M, McKune D. Emergency care facility access in Rural areas within the golden hour?: Western Cape case study. Int J Health Geogr. 2015;14:5.	South Africa	African	Upper- middle	South Africa	Regional	Rural	Quant	Cross sectional	2015	N/A	N/A
71	Wen	Wen LS, Char D. Existing infrastructure for the delivery of emergency care in post-conflict Rwanda: an initial descriptive study. Acad Emerg Med. 2011;18:S243.	Rwanda	African	Low	Kigali	Regional	Urban	Qual	Mixed methods	2007	60	Health care workers

72	Wesson	Wesson HK, Stevens KA, Bachani AM, Mogere S, Akungah D, Nyamari J, Masasabi Wekesa J, Hyder AA. Trauma systems in Kenya: a qualitative analysis at the district level. Qual Health Res. 2015 May:25(5):589-99.	Kenya	African	Lower- middle	Kenya	Regional	Urban	Qual	Descriptive Interview	2011	N/A	N/A
73	WHO/ UNICEF	WHO/UNICEF. Water, Sanitation and Hygiene in Health Care Facilities: Status in Low and Middle Income Countries and Way Forward. Geneva, Switzerland: World Health Organization, 2015.	Multinational	N/A	Lower and middle	54 countries	International	NA	Quant	Cross- sectional	1998- 2014	90	Heath care facilities
74	Zaidi	Zaidi SM, Labrique AB, Khowaja S, Lotia-Farrukh I, Irani J, Salahuddin N, et al. Geographic variation in access to dog- bite care in Pakistan and risk of dog-bite exposure in Karachi: prospective surveillance using a low-cost mobile phone system. PLoS Negl Trop Dis. 2013;7(12):e2574.	Pakistan	Eastern Mediterrar ean	Lower- middle	Karachi	Regional	Urban	Quant	Cross sectional	2009- 2011	N/A	N/A
75	Zimmerman	Zimmerman A, Fox S, Griffin R, Nelp T, Thomaz E, Mvungi M, et al. An analysis of emergency care delays experienced by traumatic brain injury patients presenting to a regional referral hospital in a low-income country. PLoS One. 2020;15(10):e0240528.	Tanzania	African	Low	Tanzania	Regional	Urban	Quant	Cross sectional	2013- 2017	3209	Patients

Supplemental material

Reference No.	Author (year)	Measures	Outcomes
1	Adewole (2012)	1. Geographic barriers	1. Rural population has less access, traffic impedes access
2	Ahmed (2019)	Percent of slums that have	Percent of slums that have
		1. 1 EU per 50,000 population	1. 12%
		2. 1 burn unit per 50,000 population	2. 0%
		Percent of population that lives	Percent of population that lives
		3. Within 60 minutes of EU	3. 63%
•		4. Within 60 minutes of burn unit	4. 32%
3	All (2006)	1. Average response time to accident	1. 10 min
4	Amparo (2018)	1. Resource issues	1. LMICs have less resources for trauma care
5	Amparo (2010)	1. Awareness of where to go for care	1. 7.4%
		2. Sought treatment for wounds	2. 44.9%
		Reasons for not seeking care	
		1. Cost	1. 22.7%
		2. Distance	2. 44.9%
		3. Sought traditional/alternative care	3. 5.6%
6	Anest (2016)	1. Training issues	1. Dispatchers lack training
		2. Staffing issues	2. Shortages of physicians and EMS providers
		3. Hospital system issues	3. Errors in triage, lack of childcare for other children in the household and restrictive hours of clinic operations, multiple transfers
		4. Pre-hospital system issues	4. Lack of transportation, Lack of telephone access and no universal emergency number.
		5. Communication issues	 Difficulty getting through on phone lines, miscommunication regarding the acuity of the patient, misunderstanding of geography and distance
		6. Barriers to reaching care	Community understanding of how to navigate the health system and emergency conditions
7	Anyumba (2019)	1. Drive time from University of Venda Clinic to scene of accident	1. 5-7 minutes
		 Drive time Tshilidzini Hospital to scene of accident 	2. 8-10 minutes
		 Drive time from Donald Frazer hospital to scene of accident 	3. 30-45 minutes
8	Aries (2007)	 Reason that patients do not seek hospital care 	1. Lack of specialized fracture treatment
		2. Barrier to prehospital care	2. Lack of resuscitation equipment
		3. Cost of treatment by a bonesetter	 Average 13 € (range 0–60 €)
		4. Cost of hospital treatment	4. 300 € (range 25–800 €).
		5. Barrier to seeking care	5. Opinion that bonesetters have more expertise.
		 Demographics associated with seeking bospital care 	Patients with compound fractures are more likely to be treated in a bospital
9	Bachani (2017)	1. Training issues	 Lack of training of pre-hospital and in-hospital providers
		2. Resource issues	2. Lack of basic hospital equipment
		3. Pre-hospital system issues	3. There was no functioning emergency number or coordinated response system.
10	Bast (2018)	1. Staffing issues	1. Lack of sufficient room and staffing
		2. Geographic issues	2. Access to facilities is limited by mountainous terrain.
		3. Secondary financial strain	3. Not having adequate child care, the inability to miss work, or being too ill to walk.
		4. Pre-hospital system issues	4. Lack of a universal EMS access code.
11	Bhopal (2013)	1. Barriers to seeking care	 Poor roads, rainy season inaccessibility, no mobile phone coverage, patient must buy petrol and pay driver, Awareness of ambulance service

eTable 2. Individual access measures and outcomes by article.

		2. Pre-hospital system issues	2. Drivers willing to respond, maintenance issues
12	Bigdeli (2010)	 Mean transport times from the scene to the hospital for interurban incidents compared to city 	1. 17.1 vs. 6.3 minutes
13	Broccoli (2015)	areas	1. When patients were dressed well, had a good attitude, showed
		 Characteristics that made it easier for natients to access care 	patience, had personal financial resources or insurance or personally
			knew a healthcare provider
		2. Barrier to care	 Many providers were unfriendly towards patients or unmotivated to provide care. Participants were also concerned about corruption.
		3. Training issues	3. Healthcare providers lack training in the basics of emergency care.
		4. Transportation issues	 Difficulty obtaining transportation, long distances required for travel.
		5. Health system issues	 Lack of emergency care after business nours, required paperwork before emergency care is provided and poor medical records systems, lack of triage
		6. Financial issues	6. High cost of treatment.
		7. Pre-hospital system issues	 Officers take patients to the police station before taking them to the hospital, creating delays.
		8. Communication issues	8. Unavailable emergency phone lines
		9. Staffing issues	9. Lack of healthcare provider
		10. Resource issues	10. Lack of resources and critical medications at facilities
14	Broccoli (2016)	1 Barrier to care	1 Lack of accessible healthcare facilities
		2 Communication issues	2 No functional emergency phone number
		3 Resource issues	3 Lack of necessary equipment
			 No standard national protocols for mass casualty incidents, no
		4. Health system issues	triage
		5. Staffing issues	5. Staff shortages
		6. Training issues	6. Lack of specific training in emergency care
		7. Barrier to reaching care	7. The distance to travel to reach a facility
		8. Transportation issues	 The time it takes for transportation to arrive, lack of fuel for vehicles and poor road conditions
		9. Financial barriers	9. Money was a barrier when trying to obtain transportation
		10. Systems issues that generate delays	10. Certain patients are required to be seen at the police station prior to receiving healthcare, which creates delays. Transferring patients to a higher-level facility with no care or stabilisation at the lower-level facility or during transport. Patients and families are responsible for arranging their transportation to the higher-level facility.
		11. Barriers to seeking care	 Lack of community knowledge about medical emergencies and emergency care. Participants felt that facility staff had bad attitudes, and thought they should be quicker to provide emergency care.
15	Burke (2014)	Percent of Level 2 and 3 Trauma facilities that:	Percent of Level 2 and 3 Trauma facilities that:
		1. had a specific approach to a trauma patient	1. 0%
		2. refer trauma immediately	2. 87%
		provide first aid and then refer trauma nationte	3. 13%
		4 are poorly equipped to handle broken bones	4 70%
		5 had suture and wound care supplies	5 87%
		6 had doves	6 90%
		7 had oxygen	7 23%
		8 had splinting/casting supplies	8 10%
		a had blood for transfusion	
		10 refer nations with a possible heart attack	10 100%
		11. refer patients with a possible heart attack	
		immediately	II. VU%
		12. treat symptoms and then refer patients with a possible heart attack	12. 27%
		possible heart attack	13. 13%
		14. had sublingual nitroglycerine	14. 3%

15. ketoa	are ill prepared to handle possible diabetic acidosis (DKA) and must refer all cases	15.	93%
16.	had a glucometer	16.	20%
17.	had insulin	17.	17%
18.	refer cases of potential sepsis immediately	18.	50%
19. sepsi	provide treatment for cases of potential s without referral	19.	37%
20.	did not know an approach to sepsis	20.	13%
21.	had antibiotics	21.	80%
22.	had an organised approach to trauma	22.	30%
23.	are notified in advance of patients arriving to	23.	13%
Perce	ospital ent of Level 4 and 5 facilities that:	Perc	ent of Level 4 and 5 facilities that:
24	had gloves	24	97%
25	had suture and wound care materials	25	93%
26	had oxygen	26	83%
27. who anae	did oxygen did not have access to a trained provider can administer general or Regional sthesia	27.	57%
28.	had morphine	28.	50%
29.	had a functioning ECG machine	29.	20%
30.	had nitroglycerine	30.	20%
31.	had a defibrillator	31.	13%
32.	are well prepared to manage DKA	32.	33%
33.	had a glucometer	33.	93%
34.	had insulin	34.	80%
35.	provided some treatment for sepsis	35.	97%
36.	had standardised clinical care guidelines	36.	0%
37. traun	do not have a standardised approach to	37.	70%
38. mach	had nitroglycerine and a functioning ECG	38.	20%
39.	had a defibrillator	39.	13%
Numl	ber of Level 5 facilities that:	Perc	ent of Level 5 facilities that had:
40.	had chest tubes and X-ray capability	40.	100%
41.	had splinting and casting supplies	41.	80%
42.	had blood available for transfusion	42.	100%
43.	gave oxygen to patients with suspected AMI	43.	100%
44.	gave aspirin to patients with suspected AMI	44.	60%
45. AMI	gave morphine to patients with suspected	45.	40%
46. AMI	gave epinephrine to patients with suspected	46.	20%
47.	had vasopressor agents	47.	100%
48.	had antibiotics	48.	100%
Num	ber of Level 4 facilities that:	Perc	ent of Level 4 facilities that had:
49.	had chest tubes	49.	12%
50.	had X-ray capability	50.	48%
51.	had blood available for transfusion	51.	64%
52. acute	refer someone presenting with a possible myocardial infarction immediately	52.	80%
53. with a	stabilize and then refer someone presenting a possible acute myocardial infarction	53.	44%
54. witho possi	provides diagnostic and treatment services ut referral to someone presenting with a ble AMI	54.	30%
55.	had vasopressor agents	55.	44%
56.	had antibiotics	56.	92%

16	Chunga (2019)	Percent of respondents that reported	Percent of respondents that reported
		1. Access to a pre- hospital service in HIC	1. 4%
		2. Access to a pre- hospital service in LMIC	2. 21%
		3. Access to a national emergency number in	3. 4%
		4. Access to a national emergency number in	4. 21%
17	Comery (2020)	1. Lackof symptom awareness	1. Qual
		2. Cost of transport to EC 2	2. Qual
		3. EC Facility access to radiology	3. Qual
		4. EC facility access to laboratory	4. Qual
		5. Cost of EC	5. Qual
		6. Cost of Medications 6	6. Qual
		7. Lack of staff	7. Qual
18	Coyle (2015)	Percent of hospitals with	Percent of hospitals with
		1. adult triage training	1. 43%
		2. pediatric triage training	2. 57%
		3. formal training in adult critical care	3. 86%
		4. in-house acute care courses for continuing ducation	4. 14%
		5. a dedicated EC nurse	5. 71%
		6. out-of-hours clinician cover 6	6. 71%
		7. intravenous (IV) gentamicin	7. 100%
		8. IV penicillin and quinine	8. 86%
		9. Oral rehydration solution and IV fluids	9. 100%
		10. insulin	10. 29%
		11. equipment required to carry out IV , procedures	11. 100%
		12. oxygen concentrators or cylinders available , in the EC	12. 43%
		13. with light unsuitable for clinical examination	13. 57%
		14. a system in place to identify ward patients , whose clinical condition was deteriorating	14. 29%
		15. guidelines for paediatric critical care	15. 71%
		16. guidelines for adult critical care	16. 57%
		17. Emergency care guidelines for children	17. 57%
		18. Emergency care guidelines for adults	18. 43%
		19. Paediatric triage guidelines	19. 43%
		20. adult triage guidelines	20. 29%
		21. guidelines for oxygen therapy	21. 29%
		22. facilities to check haemoglobin and blood glucose	22. 100%
		23. ability to measure renal function	23. 71%
		24. radiography	24. 57%
		25. had a system in place for delaying regis- tration and payment until after the receipt of 2 emergency treatment for critically unwell adults	25. 29%
		20. That a system in place for delaying registration and payment until after the receipt of emergency treatment for critically unwell children	26. 43%
		Percent of public facilities with	Percent of public facilities with
		27. adult triage training	27. 0
		28. pediatric triage training	28. 2
		Percent of private facilities with	Percent of private facilities with
		29. resuscitation facilities for adults	29. 100%
		30. all of the six infrastructure indicators	30. 100%

		31. all 23 indicator drugs and all 34 equipment indicators	31. 100%
		For public facilities, average number of	For public facilities, average number of
		32. infrastructure indicators	32. 1
		33. drug indicators	33. 16/21
		34. equipment indicators	34. 21/34
		Percent of district hospital with	Percent of district hospital with
		35. access to x-ray facilities	35. 0
		36. emergency blood transfusion	36. 0
19	De Wulf (2017)	1. Financial barriers	1. The inability to pay for transportation or medications, laboratory investigations, and radiography
		2. Health system issues	2. Limited bed capacity
20	De Wulf (2015)	Percent of hospitals with	Percent of hospitals with
		1. emergency care area beds	1. 67%
		2. Supervisory level physicians consistently available during the entire 24 hours	2. 67%
		3. with potable water	3. 0%
		4 a list of emergency equipment	4 67%
		5. emergency equipment was available	5. 4000/
		intermittently	5. 100%
		6. no formal training of staff for the use of this equipment	6. 100%
		7. surgical services and dental care	7. 67%
		8. critical care or ophthalmological services	8. 0%
		9. a protocol for the transfer of patients requiring a higher level of care	9. 33%
		Percent of clinics with	Percent of clinics with
		10. electricity	10. 20%
		11. a list of emergency equipment	11. 0%
		12. basic equipment to manage obstetrical emergencies or imminent deliveries	12. 0%
		13 pulse oximetry and alucometers	13 20%
		14 stethoscopes	14 60%
		15 HIV care	15 0%
		16 cholera and tuberculosis care	16 60%
		17. a protocol for the transfer of patients	17 000/
		requiring a higher level of care	17. 80%
		Percent of health facilities with	Percent of health facilities with
		18. respiratory isolation area	18. 0%
		19. maintenance of records for patients seen in	19. 100%
		20. existence of an additional staffing resource list to be used in event of disaster or emergency situations	20. 13%
		21. access to an ambulance for interfacility transport	21. 13%
		22. use of a protocol or phones for the transfer of nationt	22. 0%
		23. Resource issues	 Hospitals had increased access to equipment, materials, and medications compared to community clinics. No computed tomography existed in the region.
		24. Geographic barriers	24. Some of the health centers required multiple modes of transportation, not being passable consistently by 4-wheeled vehicles.
		25. Referral issues	25. Patients were referred to the closest hospital, regardless of whether that facility had the capability to handle the case.
21	El Tayeb (2015)	1. Demographics likely to use formal services	1. Males were almost twice as likely as females
		2. Financial barriers	2. Affordability of the formal health service
		3 Geographic barriers	3 Distance

Geographic barriers 3.

Distance 3.

22	Elbashir (2014)	1. Training issues	 No standardized training for EMS providers, dispatchers, or ambulance crew.
		2. Average emergency response time	2. 45 minutes
		3. Geographic barriers	3. Few citizens reside where services exist
		4. Pre-hospital issues	4. Single emergency response number is not well publicized
		5. Financial barriers	 ambulances are paid either by cash on a fee for service basis or via an insurance option
23	Emerick (2013)	1. Percent of individuals who perceived their condition as severe and sought health care in the	1. 57.4%
		formal system 2. Percent of individuals who perceived their condition as non-severe and sought health care in the formal system	2. 36.2%
		 Demographics associated with increased seeking of formal health care 	 Geographic location less than 30 minutes from a health facility, household head having a secondary school education, patient age under 15, and having health insurance
		4. Percent of individuals who received medicines free of charge	4. 26.1% in Guatemala, 29.1% in Honduras, and 34.2% in Nicaragua
		5. Financial barriers	"Do not have money" was the most frequent reason for not seeking care in Nicaragua and Honduras
24	Hashtarkhani (2020)	1. Calculated accessibility by 2SFCA method	 Peripheral areas in Mashhad city have low access to EMS. Actual accessibility in the city center is low compared with potential accessibility.
25	Hodkinson (2020)	1. Barriers to seeking care	1. Concerns over personal safety
		 Percent of people reporting wait times at facilities as a barrier to seeking care 	2. 23.1%
		3. Percent of people reporting financial barriers	3. 5.1%
		4. Pre-hospital issues	4. EMS delays
26	Hsia (2012)	Percent of hospitals	Percent of hospitals
		1. not equipped with basic building resources	1. 78% in Tanzania
		had equipment and staff who could competently utilize the equipment at their facility	2. 41% in Tanzania to 61% in Kenya
		 had adequate monitoring of medication inventory 	3. 14% in health centres and 18% in hospitals in Tanzania
		4. with adequate infection control materials	4. 0% in Tanzania
		5. with capacity to provide 24-hour emergency care	5. Fewer than half
		6. with basic infrastructure components such as water and electricity	6. less than 65%
		Percent of clinics	Percent of clinics
07	laasha (0040)	7. with basic infrastructure	7. 7% to 35% of facilities.
21	Jacobs (2016)	Fee associated with	Fee associated with
		1. hospital ambulance	1. KHR25 000 (\$6.25)
		2. Ambulance referrals to the provincial hospital	2. KHR45 000 (\$11.3)
		3. transport by tuk-tuk	3. KHR30 000 (\$7.5)
		4. overall fee associated with transport	4. KHR137 697 (\$34.4)
		5. Pre-hospital system issues	 General population did not have the contact number of the ambulance services.
		Percent of people transported to health facility using their own means of transport	6. 32%
		7. Percent of individuals who report the health system was too far	7. 9%
		8. Training issues	8. Few health district staff received training in emergency medicine
		 Percent of health centre staff members who were insufficiently qualified to successfully deal with the condition 	9. 59%
28	Khan (2003)	1. Training issues	 Neither the ambulance driver nor the nurse has any formal training or certification in advanced life support.
		2. Equipment issues	2. Ambulances lack advanced cardiac life support equipment

		3. Health system issues	 There is no physical location for advanced pediatric care or pediatric resuscitation.
		4. Pre-hospital issues	 An organized emergency medical response system does not exist, no emergency number
29	Khan (2010)	1. Mean time from occurrence of injury to arrival	1. 4.7 h
		2. Range of time from occurrence of injury to arrival in the ER	2. Range 0.8–48 h
		3. Patients who arrived in the ER after 1 hour of injury	3. 675 (69%)
		4. Patients who reached the ER within 1 hour of	4. 303 (30.9%)
30	Kirsch (1995)	Injury Percent of physicians who	Percent of physicians who
		1. had taken an Advanced Trauma Life Support	1 30%
		course 2. had taken an Advanced Cardiac Life Support course or Advanced Pediatric Life Support training	2. 0%
		Percent of physicians how believed they could	Percent of physicians who believed they could perform
		3. intubation	3. 18%
		4. tube thoracostomy	4. 15%
		5. venous cutdown	5. 15%
		6. tracheostomy	6. 5%
		7. Staffing issues	7. Nursing shortages reported in emergency departments. Trained staff were not available during many nights or weekends. IV line supplies, backboards, or cervical collars are not carried in ambulances.
		8. Resource issues	 Specialized blood tests are not easily obtained. Limited supplies of banked blood. Limited availability of CT, ultrasound, and MRI.
		9. Health system issues	 Lengthy delays in response from consulting specialities. Legal restrictions prevent ambulance drivers from starting IV lines or giving medication
		10. Communication issues.	10. The EDs do not have radios.
31	Kumar (2009)	1. Pre-hospital system issues	1. Trained personnel as first responders were unavailable and pre- hospital care was lacking
32	Levine (2007)	 Percent of patients that have access to motorized transport Percent of providers that 	1. 20%
		2. reported that their patients had to travel more than 10 km for surgical or obstetric services	2. 62.5%
		3. had access to blood smears for malaria	3. Less than half
		 lacked access to any laboratory diagnostic equipment 	4. 44%
		5. could offer blood transfusions	5. 0%
		6. felt comfortable diagnosing the 7 emergency	6. 63%
		conditions assessed 7. felt comfortable diagnosing femur fracture or pneumonia	7. 56%
		8. felt comfortable diagnosing obstructed labor	8. 75%
		felt comfortable treating the 7 emergency conditions assessed	9. 19%
		10. felt comfortable treating obstructed labor	10. 0%
		11. felt comfortable treating gastroenteritis	11. 64%
33	Luo (2020)	1. Standardized E-2SFCA access scores	1. 75% of shequs having a value lower than 0.4 for single trip and 0.8 for the total trip.
		2. Percent of shequs can be reached by an ambulance from the nearest EMS stations within 10 min	2. Over 50% and again a patient can be transported from his/ her shequ to the nearest hospital within 9 min.
34	Macharia (2009)	1. Health facilities demanded cash deposits or letters of guarantee of payment before providing	1. 14.6%
		treatment to road traffic injury patients	
		2. Cost of deposit before treatment	2. US \$6.7-667

		 Percent of health facilities that rated themselves as being well prepared to handle road traffic crash emergencies 	3. 40.8%
		Percent of respondents that	Percent of respondents that
		4. owed the hospitals more than of US \$ 133.	4. 22.3%
		5. were in a position to pay the bills	5. 19.7%
		would approach relatives and friends for financial assistance	6. 58.7%
		 were transported to hospital by unknown persons 	7. 19.7%
		8. were transported to hospital by persons who were previously known to them	8. 76.5%
		9. received any form of first aid at the crash site	9. 16.0%
		10. received first aid from members of the public, other motorists or the less injured casualties	10. 74.0%
35	Mahmood (2010)	Percent of cases in which the ambulance response time was	Percent of cases in which the ambulance response time was
		1. less than 10 minutes	1. 60%
		2. 15-20 minutes	2. 30%
		3. 30-45 minutes	3. 10%
		Percent of cases in which the time from the site to the hospital was	Percent of cases in which the time from the site to the hospital was
		4. 5 minutes	4. 32%
		5. 10-15 minutes	5. 48%
		6. 20-30 minutes	6. 20%
36	Mathew (2017)	Percent of districts that	Percent of districts that
		 had more than 80% of the population residing within half-an-hour travel distance of a PCI-capable hospital 	1. 36%
		2. had more than 90% population having timely (within 1h) access to some mode of reperfusion therapy for STEMI, either thrombolysis and/or	2. 57%
		Primary PCI Percent of the population	Percent of the population
		 residing within half-an-hour travel distance from a PCI-capable hospital 	3. 69.84%
		 had access to a thrombolysis-capable hospital within 1h travel time 	4. 21.87%
		5. would have had to travel more than an hour to access a reperfusion-capable hospital	5. 8.28%
37	Mock (1997)	Percent of respondents reporting	Percent of respondents reporting
		1. distance to treatment is too far	1. 8%
		2. preferences for other treatments	2. 37%
		3. Types of injuries more likely to receive formal medical care	3. Head or torso injuries, transportation related injuries and assaults
		4. Use of formal medical services for persons aged less than 20 years	4. 54%
		5. Use of formal medical services for persons aged more than 20 years	5. 61%
38	Mock (2001)	Percent of survey respondents reporting barriers to care:	Percent of survey respondents reporting barriers to care:
		1. preference for other treatments	1. 20%
		2. financial	2. 53%
		3. health care utilization when health care was available in the user's town	3. 59%
		 health care utilization when health care was not available in the user's town 	4. 41%
39	Mock (2006)	1. Training issues	1. Lack of training for trauma care, including in-service training for doctors, lack of training to use equipment

		2. Staffing issues	 Lack of surgical coverage. Bosources for acute resuscitation were limited. Difficulties in the
		3. Resources issues	procurement process exist. Lack of laboratory tests, imaging, oxygen, fluids, chest tube equipment, pulse oximetry, ventilators, prostheses for amoutees medications
		4. Health system issues	 Lack of trauma registry or quality improvement programs.
40	Mohan (2018)	1. Demographics associated with significant pre-hospital delay	1. Elderly, rural, and illiterate populations
		2. Barriers to seeking care	2. Recognizing symptoms as cardiac in origin
		3. Percent of hospitals with ECG availability	3. 96.4%
		4. Percent of outpatient facilities with ECG	4. 83%
		Percent of patients	Percent of patients
		5. to whom a hospital was the nearest medical	5. 54.8%
		ald for the whom a clinic way the nearest medical aid	6 45 2%
		 to whom a clinic was the nearest medical aid presented with more than 6 hours of 	0. 45.2 %
		prehospital delay	7. 42%
41	Mould-Millman	Development of:	Development of:
	(2015)	1. Tiers of Providers	1. Minimally developed
	Assessment of	2. Recruitment and Retention of providers	2. Mostly developed
	Medical Services	3. Continuing Education	3. Minimally developed
	in the Ashanti	4. Initial Education	4. Partially developed
	Region of Ghana.	5 Team Training	5 Partially developed
		6 Equipment and Medication	6 Mostly developed
		7 Toll-free Number	7 Moderately developed
		8 Call processing and dispatch	8 Partially developed
		9. Primary Transportation and Inter-facility	9. Mostly developed
		10 Communication	10 Partially developed
		11 Community Integration	10. Partially developed
		12 Healthears System Integration	12 Dertially developed
		12. EMS Logislature Bules and Regulation	12. Mastly developed
		13. EMS Legislature, Rules and Regulation	13. Mostly developed
		14. Sustainable Resources	14. Mostly developed
		15. Public Knowledge	15. Minimally developed
10	Mould Millmon	To. Quality Assurance and	To. Minimally developed
42	(2015) Accessing	Percent of survey respondents that:	Percent of survey respondents that believed that:
	Emergency	1. believe EM Is offer high-quality care	1. 54.7%
	Medical Services	2. believe it is "better" to go by ambulance	2. 86.1%
	in Accra, Ghana: Development of a	3. believe taxis are faster than ambulances in Accra	3. 78.0%
	Survey Instrument and	4. believe government ambulances were free or affordable	4. 53.2%
	Initial Application in Ghana	 believe private ambulances were too expensive 	5. 50.2%
		 knew the existence of a public access medical emergency telephone number 	6. 43.8%
		7. knew that the emergency number was a toll-	7. 37.1%
		8 would be more likely to call	8 35 7%
		 would be more likely to call the emergency number if they knew the call was toll free A second be an an	
			9. 45.5%
		service	10. 35.3%
		 indicated it would take a government ambulance 15 minutes or less to arrive at the location 	11. 6.8%
		11. indicated it would take 60 minutes or more	
43		Percent of systems that utilized:	Percent of systems that utilized:

44

45

46

47

	1. tier-one (layperson responders trained in first aid)	1. 48%
	2. tier-two (professional or medically-trained)	2. 96.0%
	3. Basic emergency medical technicians	3. 84%
	4. advanced providers more often	4. 60%
	5. basic providers more often	5. 84%
	6. prehospital nurses	6. 28%
	7. used only advanced providers	7. 4%
	8. EMS physicians	8. 40%
	9. quality assurance programs	9. 44%
	10. research	10. 12%
	11. Basic Life Support - capable vehicles	11. 84%
	12. Advanced Life Support -capable vehicles	12. 68%
Mould-Millman	13. vehicles posted at ambulance stations	13. 72%
(2017)	14. vehicles posted at health care facilities	14. 56%
	15. motorcycle ambulances	15. 12%
	16. fixed wing air transport	16. 32%
	17. rotary wing (helicopter) ambulances	17. 32%
	18. water-craft	18. 12%
	19. Total number of EMS systems identified	19. 25
	Percent of countries in which	
	20. EMS systems existed in Africa	20. 29.6%
	21. EMS systems existed in West Africa	21. 12.5%
	22. NO EMS systems existed	22. 9.3%
	23. the questionnaire was not returned	23. 51.0%
	24. some form of regulations governing EMS or ambulance operations existed	24. 100%
	25. an established toll-free emergency telephone number existed	25. 26%
Nagata (2011)	Median direct distances between injury sites and the trauma centers were	Median direct distances between injury sites and the trauma centers were
	1. Viet Duc Hospital	1. 5.65 (3.19 - 8.64) km
	2. Bach Mai Hospital	2. 5.31 (2.89 - 8.54) km
	3. Saint Paul Hospital	3. 5.11 (3.11 - 8.72) km
Natuzzi (2011)	1. Percent facilities with running water	1. 80%
	2. Percent facilities with electricity without	2. 55.6%
	Outages 3 Percent of facilities with consistent oxygen	
	source	3. 88.9%
Nielsen (2012)	1. Access to emergency care services within 1 hour	1. 100 percent in Urban Brazil, Colombia, and Maharashtra State to very low in Kenya, Pakistan, Sri Lanka, and Vietnam
	To whom advanced life support capabilities during transport was available	2. A significant number of persons in two of the upper middle income sites
	 To whom basic life support capabilities during transport was available 	 More than half of people only in South Africa and Gujarat State, India.
	4. Training issues	4. Varying levels of training of providers, including no emergency medicine training
Ntabaye (1998)	1. Resource issues	1. Lack of medicines
	2. Percent of respondents who did not have the ability to pay for health services	2. 45%
	3. Financial barriers	3. Fare for transportation
	4. Demographics more likely to seek care	 Those who had a higher number of missing teeth, were educated and aged more than 40 years
	5. Percent of respondents who indicated fear of dental treatment	5. 6.5%

48	Ouma (2018)	 Percent of people living within 2-hour travel time of the nearest public hospital 	1. 71%
		2. Percent of women of child bearing age living within 2-hour travel time of the nearest public hospital	2. 71.8%
		 Percent of people living more than 2-hour travel time of the nearest public hospital 	3. 29%
		4. Percent of women of child bearing age living more than 2-hour travel time of the nearest public hospital	4. 28·2%
		 Percent of the population within 2-hour travel time of a public hospital 	 Less than 25% in South Sudan to more than 90% in Nigeria, Kenya, Cape Verde, Swaziland, South Africa, Burundi, Comoros, São Tomé and Príncipe, and Zanzibar.
		6. Countries with less than 50% of the population within 2-hour travel time of a public emergency care hospital	 South Sudan, Mauritania, Eritrea, Niger, Sudan, Madagascar, and Chad.
		 Countries with more than 90% of their respective population living within 2-hour travel time of a bospital 	7. Nigeria, Kenya, and South Africa
		 Number of countries with more than 80% of the population within 2-hour travel time of a hospital 	8. 16
49	Phillips (2020)	1. Percent with EC training	1. 5.4% report none
		2. Purpose built EU with resus	2. 4.1 report none
		3. EU overcrowding	3. 17.6% report none
		4. EU specific equipment	4. 18.4% report none or limited
		5. Presence and use of triage	5. 39.3% report none or limited
		6. Use of EU quidleine	6. 11.6%
		 Presence of System for access to EC and 	
		first aid from trained first responders	7. 13.9% report no system
		 Presence of system to provide EC during transport between scene and facility, or between facilities 	8. 13.9% report no system
		 System to access EC from trained first responders and the scene and urgent transport to a health facility (overall system of pre-hospital care) 	9. 19.0% report no system
50	Pigoga (2020)	care)	1. Training related to critical trauma and airway interventions, and
		1. Training issues	neonatal care; issues with treating malnutrition or severe anaemia; inability to perform the following procedures: intraosseous access or venous cutdown, apply three-way dressings for sucking chest wounds or perform fasciotomies or escharotomies
		2. Health system issues	2. Only one facility with a dedicated resuscitation area
		3. Resource issues	3. Lack of medications, equipment, and tests, including: pulse oximetry, airway management, needle thoracostomy, chest tube, pelvic binders, ECG, ultrasound, thrombolytics, blood transfusion, defibrillation, cardioversion, pericardiocentesis, external cardiac pacing, procedural sedation, IV antibiotics, IV vasopressors, uterotonic drugs
		4. Quality issues	4. Lack of: clinical protocols, protocols for communicating critical lab results for infection control infection, triage
51	Radjou (2013)	1. Mean distance and time travelled by direct	1. 31.4 km, 90 min
		 Group Mean distance and time travelled by referred group 	2. 52.81 km, 279 min
		3. Percent of referred cases that clocked unnecessary distance to reach care	3. 54%
		4. Percent of direct cases that clocked unnecessary distance to reach care	4. 14.2%

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	 Median unnecessary distance clocked by referred cases to reach care 	5.	24.49 km
	 Median unnecessary distance clocked by direct cases to reach care 	6.	10.86 km
Razzak (2001)	1. Training issues	1.	No ambulance driver had formal training in first aid or prehospital
	2. Percent of ambulance services that carry	2.	71%
	only a stretcher 3. Cost of transport for non-air-conditioned ambulanace	3.	Pakistani rupee (PR) 7–10 (\$0.12–0.17) per mile
	4. Cost of transport for air-conditioned ambulances	4.	PR 15–20 (\$0.26–0.35) per mile
	5. Percent of ambulance services that operate	5.	8%
	Percent of patients that said	Perc	cent of patients that said
	 the streets in their area were too narrow for an ambulance 	6.	3%
	7. they did not use ambulances due to high cost	7.	8%
	8. they preferred using taxis or cars due to easy access	8.	38%
	9. the patient was not sick enough to call an ambulance	9.	26%
	10. they used a taxi because the patient was too sick to wait for anything else	10.	20%
	11. patient was sick enough to come to the ED	11.	45%
	12. they did not come to the ED because of the slow response of the ambulance service	12.	23%
	13. they did not come to the ED because they did not know how to find one	13.	11%
	14. they would call an ambulance only if they are unable to walk	14.	44%
	15. they would call an ambulance only if they were very sick or near death	15.	22%
	16. they were not sure when to call an ambulance	16.	21%
	17. they knew of at least one ambulance service	17.	57%
	18. they knew of two ambulance services	18.	21%
	19. they did not know of any ambulance service	19.	14%
	20. knew the phone number of any ambulance service	20.	0%
Ro (2017)	Percent of respondents that reported the primary reasons for not seeking health care were:	Perc seek	ent of respondents that reported the primary reasons for not king health care were:
	1. financial	1.	37.2%
	2. use of complementary medicine	2.	22.2%
	3. the that condition was not severe enough to visit hospital	3.	8.7%
	4. limited accessibility to hospital	4.	5.7%
	5. social and family disapproval	5.	4.6%
	Those who were more likely to experience unmet needs in the previous year	6. who	People whose mean income was below moderate levels, those lived far from a teaching hospital or close to a district hospital
Rocha (2017)Addressing	1. States with high levels of accessibility	1. Cea	Paraná, Goiás, Minas Gerais, Bahia, Piauí, Rio Grande do Norte, rá e Pernambuco
access barriers to emergency care	 Number of municipalities that had high accessibility to small hospitals and low to high complexity center 	2.	1595
National ecologic study of hospitals in Brazil.	 Percentage of municipalities with below average access to high complexity center that were covered by small hospitals 	3.	74%
	4. Number of municipalities that did not meet the criteria of maximum travel time of 2 hours	4.	824

driver had formal training in first aid or prehospital

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55	Rocha (2017) Access to emergency care	 Percentage of small hospitals that were in municipalities that had also high complexity centers 	1.	26% of small hospitals
	services: a transversal ecological study	2. Percentage of municipalities were located within less than 60 km from the closest city with a high complexity center with an adult ICU	2.	63%
	emergency health care	away from a high complexity center with an adult ICU	3.	14 million
	network.	 Percent of the population who were more than 120 km away from a health facility with a neonatal ICU 	4.	12%
56	Roy (2010)	1. Training issues	1.	Lack of training of ambulance attendants
		2. Equipment issues	2.	No resuscitation equipment in the ambulance
		Odds ratio of likelihood the following groups would receive prehospital care:	Odd care	s ratio of likelihood the following groups would receive prehospital ::
		road traffic accident victims	3.	2.3
		4. arriving by government ambulance	4.	10.83
		5. arriving by taxi	5.	0.54
		6. being transferred from other medical facilities for "medico-legal reasons"	6.	0.1
57	Scolari (2018)	1. Resource issues	1.	Lack of laboratory testing
		2. Acceptability issues	2. the p	Conduct of health professional does not meet the expectations of patients
		Health systems issues	3.	Hours of operation and bed limitations
	.	4. Geographic barriers	4.	Geographic relationship to care
58	Sheikhbardsiri (2020)	1. Mean of patient's rights observed	1.	130.3 (SD: 40.1)
59	Siddiqui (2008)	1. Mean distance from the residence to the hospital	1.	56.75km±123km.
		Percent of patients who		
		2. came late who were referred	2.	63 %
		symptoms	3.	86.5%
		4. were first taken to another hospital mainly cardiac hospital and then referred here	4.	60.6%
		5. first opted for alternative medicines	5.	12.7%
		6. thought stroke symptoms would resolve	6.	28%
		7. did not know a single symptom of stroke	7.	32%
		8. knew at least one stroke symptom	8.	10.9%
		9. hemiplegia was the most familiar stroke	9.	67%
		symptom 10. speech disturbance was the most familiar	10.	61%
		11. Median time from onset of symptoms and	11	30 minutes
00	0	contact with general practitioner		
60	(2006)	within 30 days of first consultation for those acquainted with a medical doctor	1.	0.55
		2. Those whom were less likely to present a severely ill child	2.	Mothers belonging to Muslim ethnic groups
61	Sohayla (2020)	1. Accessed EC in last 12 months	1.	5%
		2. Aware of EC services	2.	Very good: 67.7%
62	Stein (2016)	1. Pre-hospital issues	1. eme	Lack of a single toll-free emergency number, knowledge of the rgency number, available community first responders, 24-hour EMS
		2 Accentability issues	aval 2	Accentability of EMS to the community
63	Sultan (2019)	Factors associated with increased likelihood of ambulance use	<u>-</u> . 1.	Amharic speaking, previous ambulance use

		2. Odds ratio associated with the ambulance use and police as a patient companion	2. 1.53
		3. Pre-hospital issues	Long arrival time for ambulance, not enough distribution of ambulance stations, and difficulty of accessing the phone
64	Suriyawongpaisal	1. Financial barriers	1. Preauthorization
	(2018)	 Demographics associated with financial barriers 	2. Females were less likely to have preauthorization
65	Suriyawongpaisal (2016)	1. Financial barriers	1. Copayment
66	Tansley (2015)	1. Percent of the population within 50km of road travel distance to tertiary care	1. 28%
		 Proportion of a region's population within a 50-km service area of a Level C facility 	2. 0% in the more remote regions to 95.4% in the most Urban region Haiti, 0% in the Nord Ouest department to 89.1% in the Ouest department
67	Tansley (2016)	1. Proportion of Ghana's landmass that is serviceable within 60-minutes of an National Ambulance Service station (from 2004 to 2014)	1. 8.7 to 59.4%
		minute catchment area of a N/AS station (from 2004 to 2014)	2. 37% to 79%
		3. Population within a 30-minute catchment	3. 26% to 61%
		4. Ambulances per 100,000	 0.05 in the Obuasi Municipal District to 2.4 in the Sissala West District
		Percent of facilities in Namibia found to be capable of providing care level:	Percent of facilities in Namibia found to be capable of providing level:
		5. A	5. 12.4%
		6. B	6. 7.3%
		7. C	7. 1.2%
		8. X (unsuitable for providing emergency care)	8. 88%
		Percent of facilities in Haiti found to be capable of providing care level:	Percent of facilities in Haiti found to be capable of providing care level
		9. A	9. 18.9%
		10. B	10. 1.7%
			12 81.1%
68	Thomson (2005)	12. A	12. 01.1% Rural district and small Urban hospitals have no emergency
00	110113011 (2000)	1. Health system issue	department
		2. Training issue	2. No emergency medicine training
		3. Staffing issue	3. EDs are staffed by only one doctor
		4. Resource issues	4. Lack of CT availability after hours
		5. Financial barriers	5. Patients must pay cash for any imaging
		6. Pre-hospital system issues	6. Ambulances have to travel up to 200 miles, lack of helicopters, private ambulance services have tried to link their control rooms to cellular networks, which has delayed response to major accidents and incidents by the responsible authorities, lack of dispatchers
69	Treleaven (2017)	1. Demographics that demonstrated worse outcomes	1. Poorer, younger, rural, and children who were referred from another facility children
70	Vanderschuren (2015)	1. Percent of fatalities that were outside of the Golden Hour	1. 53.1%
		2. Fatality rate within the service areas	2. 2.25 fatalities/km
71	Mon (2011)	3. Fatality rate within the service gaps	3. 2.91 fatalities/km
71	wen (2011)	1. Financial barriers	1. Payment is requested at the time of care
		2. Percent of individuals who were prevented from receiving treatment due to lack of payment	2. one-third
		3. Pre-hospital system issues	3. Lack of prehospital care
		4. Geographic barriers	4. Hours of travel are required in remote areas
		5. Resource issues	5. Lack of resources, including electricity and equipment

		6. Training issues	6. No emergency medicine training, one hospital provided specialised training at the basic life support (BLS) level, and no hospital provided courses such as Advanced Cardiac Life Support (ACLS), Advanced Trauma Life Support (ATLS), or Paediatric Advanced Life Support (PALS) training.
72	Wesson (2015)	1. Training issues	 No formal or trauma-specific training, very few providers are trained in BLS or ACLS.
		2. Resource issues	2. Lack of basic trauma equipment.
		3. Geographic barriers	3. Distance to a facility
		4. Pre-hospital issues	 A publically available ambulance system did not exist, lack of community awareness of emergency phone number, lack of function of emergency phone number
		5. Transportation issues	5. Lack of transport to the health care facility.
		6. Staffing issues	6. It is not safe for the medical officers to report to the hospital at night
		7. Financial issues	Inability to pay hospital fees and transport
		8. Respondents' opinion on how to improve	8. Provide first aid and triage trauma training to community members
		9 Eactors affecting the decision to seek care	9 Severity of the injury traditional medicine and religion
73	WHO (2015)	1 Availability of potatble water	1 Globally: 62% AFRO: 58% AMRO: 70% SEARO: 78%
		2. Avavilability of sanitation	2. Globally: 81%, AFRO: 84%, AMRO: 57%
		3. Availability of hand hygiene (soap)	3. Globally: 65%, AFRO: 64%, AMRO: 65%
74	Zaidi (2013)	1. Median travel time to ER	1. From Hyderabad: (20 minutes), from Mansehra (120 minutes).
		 Odds ratio associated with patients likely to seek immediate health care at a non-medical facility or administer self- treatment compared to visiting a medical facility 	2. Peshawar: 144.45 , Bahawalpur: 131.36, Abbottabad - 5.12, Hyderabad - 6.87
75	Zimmerman (2020)	Percent of patients who waited the following times to evaluated by a physician in the ED	Percent of patients who waited the following times to evaluated by a physician in the ED
		1. 0.0 to 15.0 minutes	1. 69.2%
		2. 15.1 to 30.0	2. 19.0%
		3. more than 45.0 minutes	3. 7.8%
		4. 30.1 to 45.0 minutes	4. 4.1%
		5. Percent of patients who waited the 0.0 to 1.0 hours to receive lab tests	5. 48.4%
		Percent of severe GCS patients who received lab tests within 1.0 hours of physician evaluation	6. 56.1%
		7. Percent of mild GCS patients who received lab tests within 1.0 hours of physician evaluation	7. 52.0%
		 Percent of moderate GCS patients who received lab tests within 1.0 hours of physician evaluation 	8. 53.0%