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Supplementary appendix

This appendix formed part of the original submission. We post it as supplied by the authors.

Supplement to: Sonenthal PD, Masiye J, Kasomekera N, et al. COVID-19 preparedness in Malawi: a national facility-based critical care assessment. *Lancet Glob Health* 2020; published online May 25. [http://dx.doi.org/10.1016/S2214-109X\(20\)30250-3](http://dx.doi.org/10.1016/S2214-109X(20)30250-3).

Supplementary Materials

The Malawi Emergency and Critical Care Survey

The data presented in this manuscript come from the Malawi Emergency and Critical Care (MECC) Survey - a cross-sectional study designed prior to the SARS-CoV-2 pandemic - whose aim is to measure emergency and critical care readiness through administration of a survey instrument at a sample of public sector hospitals in Malawi.

The methodology of the MECC Survey is based on the World Health Organization's (WHO) Service Availability and Readiness Assessment (SARA), a facility-based survey tool developed to assess service availability and readiness of the health sector.¹ Part of the WHO SARA methodology involves service-specific (e.g. family planning, antenatal care, basic obstetric care, tuberculosis services, etc.) assessments. However, the current version of the WHO SARA does not contain service-specific questions on emergency and critical care. The MECC Survey was designed in part to fill this gap.

Instrument Development

The MECC Survey combined the WHO Hospital Emergency Unit Assessment Tool with additional questions on emergency and critical care capacity at hospitals in low-income countries. These additional questions were developed and refined through a modified Nominal Group Technique (Figure S1). In November 2018, we piloted these questions with a convenience sample of 10 clinicians at Neno District Hospital in Malawi. To gather information on comprehensiveness, clarity, and face validity of the questions we also administered an established clinical sensibility tool for critical care survey development.² The results from this tool are presented in Table S1. The questions were then further refined based on feedback from the pilot study.

Sample Size Determination and Selection

We estimated a sample size of nine district hospitals for the MECC Survey using the methodology recommended by the WHO SARA. District hospitals were selected from a master list of all 24 district hospitals in Malawi using simple randomization with a random number generator.

Figure S1: Instrument Development Process

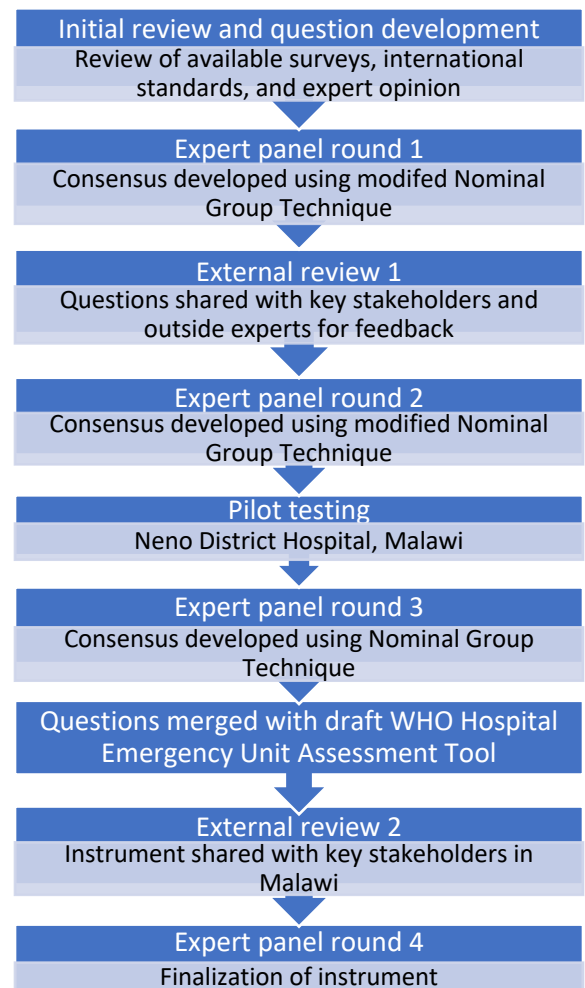


Table S1. Results from pilot study³

Clinical sensibility tool item	Score out of 5 (SD)
Directed at important issues	4·8 (0·4)
Easily understood	4·6 (0·5)
Likely to elicit relevant facility information	4·5 (0·7)
Likely to identify capacity to care for critically ill patients	4·6 (0·7)

Results from survey pilot study with 10 clinicians from Neno District Hospital, Malawi. Participants were asked to rank agreement with each item on a scale of 1 to 5, with 5 indicating strongest agreement.

Table S2. Clinical staff respondent data, by hospital unit⁺

	OPD/ED	Ward	ICU/HDU	All Units
Total respondents <i>n</i>	39	39	23*	101
Number of hospitals represented <i>n</i>	13	13	7 [†]	13
Average number of days per week spent working in unit <i>median (IQR)</i>	5 (5 to 6)	5 (5 to 5)	5 (5 to 5)	5 (5 to 5)
<i>Role</i>				
Nurse <i>n (%)</i>	21 (54)	27 (69)	13 (57)	61 (60)
Clinical officer <i>n (%)</i>	10 (26)	7 (18)	7 (30·4)	24 (24)
Doctor (with or without subspecialty training) <i>n (%)</i>	2 (5)	5 (13)	2 (9)	9 (9)
Medical assistant <i>n (%)</i>	4 (10)	0 (0)	0 (0)	4 (4)
Other <i>n (%)</i>	1 (3)	0 (0)	1 (4)	2 (2)
Missing/Unknown <i>n (%)</i>	1 (3)	0 (0)	0 (0)	1 (1)

ICU: intensive care unit, HDU: high dependency unit, OPD: outpatient department, ED: emergency department

[†]Data from 13 administrators not included here.

*One unit had two respondents.

[†]Data were collected at eight intensive care or high-dependency units, with one hospital having both an intensive care unit and a high-dependency unit

References

- 1 World Health Organization. Reference Manual: Service Availability and Readiness Assessment (SARA) - An annual monitoring system for service delivery. 2015 DOI:10.1021/la951504r.
- 2 Leligdowicz A, Bhagwanjee S, Diaz J V, *et al.* Development of an intensive care unit resource assessment survey for the care of critically ill patients in resource-limited settings. *J Crit Care* 2017; **38**: 172–6.
- 3 Sonenthal PD, Rouhani SA, Scott KW, *et al.* Developing and Piloting a Novel Survey Instrument to Assess Emergency and Critical Care Capacity at District Hospitals in Low-Income Countries [poster presentation]. 11th Annual Consortium of Universities for Global Health Conference; April 18-20, 2020; Washington, DC (conference canceled).