

Table A: Process clinical quality indicators

Rank	Indicator	Definition
1	Blood glucose checked in patient with change in mental status	% of patients with documented change in mental status who have blood glucose (BG) checked Numerator: # of patients with documented change in mental status who have BG checked Denominator: # of patients with documented change in mental status
2	Antibiotics given for paediatric pneumonia	% of patients < 5 with pneumonia given antibiotics during EU length of stay Numerator: # of patients < 5 with pneumonia given antibiotics during EU length of stay Denominator: # of patients < 5 with pneumonia
3	Bronchodilator treatment given for asthma patients	% of patients with documentation of asthma who receive bronchodilator treatment Numerator: # of patients with documentation of asthma who receive bronchodilator treatment Denominator: # of patients with documentation of asthma
4	Recording of initial complete vital signs	% of patient encounters with recording of initial completed vital signs (VS) Numerator: # of patient encounters with recording of initial completed VS Denominator: # of patient encounters
5	Documentation of diagnosis	% of patients with documented diagnosis Numerator: # of patients with documented diagnosis Denominator: # of patients seen in EU
6	Antibiotics given for adults with pneumonia	% of adult patients with pneumonia given antibiotics during EU length of stay Numerator: # of adult patients with pneumonia given antibiotics during EU length of stay Denominator: # of adult patients with pneumonia
7	Adult patients with shock given IV fluids	% of adult patients with SBP < 90 given intravenous fluids (IVF) Numerator: # of adult patients with SBP < 90 mmHg given IVF Denominator: # of adult patients with SBP < 90 mmHg
8	Action taken to control postpartum haemorrhage	% of patients with postpartum haemorrhage who receive medication to control bleeding Numerator: # of patients with postpartum haemorrhage who receive medication to control bleeding Denominator: # of patients with postpartum haemorrhage
9	Hypoglycaemic patients given glucose	% of patients with blood glucose < 70 mg/dL given glucose Numerator: # of patients with blood glucose < 70 mg/dL given glucose Denominator: # of patients with blood glucose < 70 mg/dL
10	Recording of demographics and chief complaint	% of charts with recording of chief complaint and demographics Numerator: # of charts with recording of chief complaint and demographics Denominator: # of charts
11	Pregnancy test checked in women of reproductive age	% of female patients of reproductive age with pregnancy test checked Numerator: # of female patients age 15–49 with pregnancy test checked Denominator: # female patients age 15-49
12	Supplemental oxygen given for hypoxic patients	% of patients with SaO2 < 92% who had supplemental oxygen given Numerator: # of patients with SaO2 < 92% with documentation of supplemental O2 Denominator: # of patients with SaO2 < 92 %
13	Long bone splinting for patients presenting with extremity fracture	% of patients with extremity fracture who are splinted Numerator: # of patients with extremity fracture who are splinted Denominator: # of patients with extremity fracture
14	Parental magnesium given to patients with eclampsia/pre-eclampsia	% of patients with diagnosis of eclampsia or pre-eclampsia receiving magnesium Numerator: # of patients with diagnosis of eclampsia or pre-eclampsia receiving magnesium Denominator: # of patients with diagnosis of eclampsia or pre-eclampsia

15	Action taken to control external haemorrhage	% of patients with active external bleeding who have physical manoeuvres applied to control haemorrhage Numerator: # of patients with active external bleeding who have physical manoeuvres applied to control haemorrhage documented Denominator: # of patients with active external bleeding
16	Blood transfusion given to patients meeting transfusion criteria	% of patients meeting local transfusion criteria who receive blood transfusion Numerator: # of patients meeting local transfusion criteria who receive blood transfusion Denominator: # of patients meeting local transfusion criteria
17	Antibiotics given for patients with sepsis	% of patients with diagnosis of sepsis given antibiotics during EU length of stay Numerator: # of patients with a diagnosis of sepsis given antibiotics during EU length of stay Denominator: # of patients with sepsis
18	Corticosteroid treatment given for asthma patients	% of patients with documentation of asthma who receive corticosteroid treatment Numerator: # of patients with documentation of asthma who receive corticosteroid treatment Denominator: # of patients with documentation of asthma
19	Analgesia given to patients reporting pain	% of patients with documentation of pain who receive pain medications Numerator: # of patients with documentation of pain who receive pain medications Denominator: # of patients with documentation of pain
20	Documentation of disposition	% of patients with documented disposition Numerator: # of patients with documented disposition Denominator: # of patients
21	Primary survey performed for all trauma patients	% of patients with chief complaint of trauma with documented primary survey Numerator: # of patients with chief complaint of trauma with documented primary survey Denominator: # of patients with chief complaint of trauma
22	Tetanus vaccination updated for susceptible adult patients	% of patients age > 18 with open wound and documentation of tetanus vaccination given (or patient's reported recent vaccination) Numerator: # of patients age > 18 with open wound and documentation of tetanus vaccination given (or patient's reported recent vaccination) Denominator: # of patients age > 18 with open wound
23	Documentation of reason for transfer	% of patients with documented reason for transfer Numerator: # of patients with documented reason for transfer Denominator: # of patients being transferred
24	Initial assessment for all patients	% of patients receiving an initial assessment Numerator: # of patients receiving an initial assessment Denominator: # of patients arriving at EU
25	FAST exam performed for blunt abdominal trauma	% of patients with chief complaint of blunt abdominal trauma who have documented results of Focused Assessment with Sonography in Trauma (FAST) exam Numerator: # of patients with chief complaint of blunt abdominal trauma who have documented results of FAST exam Denominator: # of patients with chief complaint of blunt abdominal trauma
26	Rate of triage	% of patients arriving to the EU receiving a triage score Numerator: # of patients arriving to the EU receiving a triage score Denominator: # of patients treated in the EU
27	Vital signs recorded every 15 min for highest acuity patients	% of patients with highest triage priority who have VS recorded every 15 min in the first hour of presentation Numerator: # of patients with highest triage priority who have VS recorded every 15 min in the first hour of presentation Denominator: # of patients with highest triage priority
28	Triage level categorisation	% of patients by triage level Numerator: # of patients with designated triage level Denominator: # of patients seen in the EU

Rankings reflect relative priority within the specific category. For overall ranking of all collected indicators, please see appendix 1.

Table B: Time based process indicators

Rank	Indicator	Definition
1	Time to triage	<p>Mean time to triage assessment Numerator: sum of time from EU registration to triage assessment for all patients with registration time and triage assessment time recorded Denominator: # of patients with triage assessment time recorded</p> <p>Median time to triage assessment</p>
2	Time to the operating theatre	<p>Mean time to EU departure for the operating theatre (OT) Numerator: sum of time from EU arrival to EU departure with a documented arrival and departure time with a disposition of OT Denominator: # of patients with EU arrival and departure time recorded and a disposition of "OT"</p> <p>Median time to EU departure for the OT</p>
3	Time to the ICU	<p>Mean time to EU departure for the intensive care unit (ICU) Numerator: sum of time from EU arrival to EU departure with a documented arrival and departure time with a disposition of ICU Denominator: # of patients with EU arrival and departure time recorded and a disposition of ICU</p> <p>Median time to EU departure for the ICU</p>
4	Time to consult received	<p>Mean time from consult requested to consult received Numerator: sum of time from consult request to consult received Denominator: # of patients with consult request and consult received time recorded</p> <p>Median time from consult requested to consult received</p>
5	Time to EU departure for transferred patients	<p>Mean time to EU departure for transferred patients Numerator: sum of time from EU arrival to EU departure with a documented arrival and departure time with a disposition of "transfer" Denominator: # of patients with EU arrival and departure time recorded and a disposition of "transfer"</p> <p>Median time to EU departure for transferred patients</p>
6	Time to disposition decision	<p>Mean time from arrival to EU disposition decision Numerator: sum of time from EU arrival to disposition decision documented Denominator: # of patients with disposition decision time recorded</p> <p>Median time from arrival to EU disposition decision</p>

Time based indicators are unlikely to be feasible to collect in many African settings given limitation of current documentation; this list is for those systems that are able to record such times.

Rankings reflect relative priority within the specific category. For overall ranking of all collected indicators, please see Appendix 1.

Table C: Structure quality indicators – Intra-facility

Rank	Indicator	Definition
1	Availability of essential medications	% of essential medications available in the EU Numerator: # of essential emergency medication available within the EU at time of assessment Denominator: # of essential emergency medications listed
2	Availability of essential emergency equipment	% of essential emergency equipment available in the EU Numerator: # of essential emergency equipment items available within the EUs at time of assessment Denominator: # of essential emergency equipment items listed
3	Nurses with triage training	% of nursing staff who have received triage training Numerator: # of nursing staff who have received triage training Denominator: # of nursing staff in the EU
4	Nurse training in emergency care	% of nurses receiving training in emergency care Numerator: # of nurses receiving training in emergency care Denominator: # of nurses in EU
5	Provider training in emergency care	% of providers receiving training in emergency care Numerator: # of providers receiving formal training in emergency care Denominator: # of providers
6	Provider availability	Number provider-hour coverage in EU per 100 EU visits Numerator: sum hours worked by each provider for all providers in an EU over the last 7 days Denominator: # of patients in the last 7 days * 100
7	Maintenance logs for equipment	% of essential equipment with up to date maintenance logs Numerator: # of essential equipment with up to date maintenance logs Denominator: # of essential equipment in the EU
8	Staff retention – turnover	% of permanent staff who leave the EU in a given year Numerator: # of permanent staff who leave the EU in a given year Denominator: # of permanent staff in the EU
9	Staff retention - callouts	% of callouts per week Numerator: sum of callouts per week Denominator: # of staff members scheduled per week

Rankings reflect relative priority within the specific category. For overall ranking of all collected indicators, please see Appendix 1.

Table D: Structure quality indicators – health system

These indicators were included as essential to measure at level of facility. Their presence or absence as an indicator reflects on the structural quality of the facility based emergency care system. These indicators were excluded from Phase 4 expert ranking.

Indicator	Definition
Right to emergency care for all	Presence of a policy for comprehensive service delivery for all emergent patients regardless of ability to pay. Presence of a policy for equitable access for different races/gender, vulnerable populations and minority groups.
<i>Denominator for all following indicators: # of EUs within the region</i>	
Syndromic surveillance guidelines for targeted diseases	% of EUs with syndromic surveillance guidelines for targeted diseases Numerator: # of EUs with syndromic surveillance guidelines for targeted diseases
Data reported to national Health Management Information System (HMIS)	% of EUs reporting to national Health Management Information System (HMIS) Numerator: # of EUs reporting to national HMIS system
EU level disaster planning	% of EUs with plan for Mass Casualty Incidents Numerator: # of EUs with plan for Mass Casualty Incidents
Presence of triage protocols involving tiered classification	% of EUs with triage protocols Numerator: # of EUs with triage protocols
Dedicated registration in the EU	% of EUs with dedicated registration Numerator: # of EUs with dedicated registration
Dedicated triage in the EU	% of EUs with dedicated triage area Numerator: # of EUs with dedicated triage area
Adequate security in the EU	% of EUs with adequate security in the EU Numerator: # of EUs with adequate security in the EU
Dedicated EU leadership personnel	% of EUs with dedicated leadership personnel Numerator: # of EUs with dedicated leadership
Presence of clinical guidelines for emergency care	% of EUs with clinical guidelines for emergency care Numerator: # of EUs with clinical guidelines for emergency care
Presence of trauma protocol	% of EUs with trauma protocol Numerator: # of EUs with trauma protocol
Presence of sepsis protocol	% of EUs with sepsis protocol Numerator: # of EUs with sepsis protocol
Presence of reactive airway disease protocol	% of EUs with reactive airway disease protocol Numerator: # of EUs with reactive airway disease protocol
Regular audits of EU diagnostics and/or treatment compliance	% of EUs with regular audits of EU diagnostics and/or treatment compliance as dictated by local priority Numerator: # of EUs with regular audits of EU diagnostics and/or treatment compliance as dictated by local priority
Isolation area	% of EUs with isolation area Numerator: # of EUs with isolation area
Decontamination area	% of EUs with decontamination area Numerator: # of EUs with decontamination area
Areas for paediatric patients	% of EUs with area for paediatric patients Numerator: # of EUs with area for paediatric patients
Areas for psychiatric patients	% of EUs with area for psychiatric patients Numerator: # of EUs with area for psychiatric patients
Continuing education for emergency providers	% of EUs that offer CPD courses for emergency medicine topics Numerator: # of EUs that offer CPD courses for emergency medicine topics
Laboratory access	% of EUs that have laboratories open 24 hrs/day Numerator: # of EUs that have laboratories open 24 hrs/day
Prioritisation of lab specimens	% of hospital labs that prioritise EU specimens Numerator: # of hospital labs that prioritise EU specimens

Established transfer criteria	% of EUs with established transfer criteria Numerator: # of EUs with established transfer criteria
Established timely disposition criteria	% of EUs with established timely disposition criteria Numerator: # of EUs with established timely disposition criteria
Quality improvement system	% of EUs with quality improvement system in place Numerator: # of EUs with quality improvement system in place
Staff feedback system	% of EUs with staff feedback system in place Numerator: # of EUs with staff feedback system in place
Referral system	% of EUs with established referral networks Numerator: # of EUs with established referral networks
Patient handover – in hospital	% of EUs with established in-hospital handover protocol Numerator: # of EUs with established in hospital handover protocols
Patient handover – inter-facility	% of EUs with established inter-facility handover protocol Numerator: # of EUs with established in inter-facility handover protocols

Ranking was not performed for health system indicators.