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Development of a quality indicator set to measure and improve quality of ICU care in low- and middle-income countries

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Chennai Critical Care Consultants, Pvt Ltd, Chennai, India

Abstract
Purpose: To develop a set of actionable quality indicators for critical care suitable for use in low- or middle-income countries (LMICs). Methods: A list of 84 candidate indicators compiled from a previous literature review and stakeholder recommendations were categorised into three domains (foundation, process, and quality impact). An expert panel (EP) representing stakeholders from critical care and allied specialties in multiple low-, middle-, and high-income countries was convened. In rounds one and two of the Delphi exercise, the EP appraised (Likert scale 1–5) each indicator for validity, feasibility; in round three sensitivity to change, and reliability were additionally appraised. Potential barriers and facilitators to implementation of the quality indicators were also reported in this round. Median score and interquartile range (IQR) were used to determine consensus; indicators with consensus disagreement (median < 4, IQR ≤ 1) were removed, and indicators with consensus agreement (median ≥ 4, IQR ≤ 1) or no consensus were retained. In round four, indicators were prioritised based on their ability to impact cost of care to the provider and recipient, staff well-being, patient safety, and patient-centred outcomes. Results: Seventy-one experts from 30 countries (n = 45, 63%, representing critical care) selected 57 indicators to assess quality of care in intensive care unit (ICU) in LMICs: 16 foundation, 27 process, and 14 quality impact indicators after round three. Round 4 resulted in 14 prioritised indicators. Fifty-seven respondents reported barriers and facilitators, of which electronic registry-embedded data collection was the biggest perceived facilitator to implementation (n = 54/57, 95%) Concerns over burden of data collection (n = 53/57, 93%) and variations in definition (n = 45/57, 79%) were perceived as the greatest barrier to implementation. Conclusion: This consensus exercise provides a common set of indicators to support benchmarking and quality improvement programs for critical care populations in LMICs. © 2022, The Author(s).

Author Keywords
Critical care; Delphi technique; LMIC; Quality indicators; Resource constrained

Index Keywords
adult, article, benchmarking, consensus, controlled study, Delphi study, drug safety, exercise, feasibility study, female, high income country, human, intensive care, intensive care unit, Likert scale, major clinical study, male, middle income country, outcome assessment, patient safety, reliability, total quality management, validity, wellbeing, Delphi study, developing country, health care quality, reproducibility; Delphi Technique, Developing Countries, Humans, Intensive Care Units, Quality Indicators, Health Care, Reproducibility of Results

References

- Huijben, J.A., Wiegers, E.J.A.
  Development of a quality indicator set to measure and improve quality of ICU care for patients with traumatic brain injury
  (2019) *Crit Care*, 23, p. 95.
- Murthy, S., Wunsch, H.
  Clinical review: International comparisons in critical care—lessons learned
  (2012) *Crit Care*, 16, p. 218.
- Kruk, M.E., Gage, A.D., Joseph, N.T.
  Mortality due to low-quality health systems in the universal health coverage era: a systematic analysis of amenable deaths in 137 countries
  (2018) *Lancet*, 392, pp. 2203-2212.

- Kallen, M.C., Roos-Blom, M.-J., Dongelmans, D.A.
Development of actionable quality indicators and an action implementation toolbox for appropriate antibiotic use at intensive care units: a modified-RAND Delphi study
(2018) *PLoS ONE*, 13.

- Viergever, R.F., Olifson, S., Ghaffar, A., Terry, R.F.
A checklist for health research priority setting: nine common themes of good practice
(2010) *Health Res Policy Sys*, 8, pp. 1-9.

- Anema, H.A., Kievit, J., Fischer, C.
Influences of hospital information systems, indicator data collection and computation on reported Dutch hospital performance indicator scores
(2013) *BMC Health Serv Res*, 13, p. 212.

- Rhodes, A., Moreno, R.P., Azoulay, E.
Prospectively defined indicators to improve the safety and quality of care for critically ill patients: a report from the Task Force on Safety and Quality of the European Society of Intensive Care Medicine (ESICM)
(2012) *Intensive Care Med*, 38, pp. 598-605.

- Fischer, C., Lingsma, H.F., Anema, H.A.
Testing the construct validity of hospital care quality indicators: a case study on hip replacement
(2016) *BMC Health Serv Res*, 16, p. 551.

- Hanefeld, J., Powell-Jackson, T., Balabanova, D.
Understanding and measuring quality of care: dealing with complexity
(2017) *Bull World Health Organ*, 95, pp. 368-374.

- Odland, M.L., Nepogodiev, D., Morton, D.
Identifying a basket of surgical procedures to standardize global surgical metrics: an international Delphi study
(2021) *Ann Surg*, 274, pp. 1107-1114.

- Kruk, M.E., Gage, A.D., Arsenault, C.
High-quality health systems in the sustainable development goals era: time for a revolution
(2018) *Lancet Glob Health*, 6, pp. e1196-e1252.

- Howell, S.J., Pandit, J.J., Rowbotham, D.J.
National Institute of Academic Anaesthesia research priority setting exercise
(2012) *Br J Anaesth*, 108, pp. 42-52.

- Kok, M., De Souza, D.K.
Young voices demand health research goals
(2010) *Lancet*, 375, pp. 1416-1417.

- Dewar, J.A., Friel, J.A.
Delphi method
(2001) *Encyclopedia of operations research and management science*, pp. 208-209. Gass SI, Harris CM, (eds), Springer US, New York, NY

- Jünger, S., Payne, S.A., Brine, J.
Guidance on conducting and reporting Delphi studies (CREDES) in palliative care: recommendations based on a methodological systematic review
(2017) *Palliat Med*, 31, pp. 684-706.

- (2021) *Zoom Video Communications Inc.*,

- CRIT CARE ASIA, A., Beane, A., Dondorp, A.M., Taqi, A.
  Establishing a critical care network in Asia to improve care for critically ill patients in low- and middle-income countries
  (2020) *Crit Care*, 24, p. 608.

- Jawad, I., Rashan, S., Sigera, C.
  A scoping review of registry captured indicators for evaluating quality of critical care in ICU
  (2021) *J Intensive Care*, 9, pp. 1-12.

- Burns, P.B., Rohrich, R.J., Chung, K.C.
  The levels of evidence and their role in evidence-based medicine
  (2011) *Plast Reconstr Surg.*, 128, pp. 305-310.

- *Constructs—the Consolidated Framework for Implementation Research*,
  Accessed 10 Nov 2021

- (2007) *Everybody's business—strengthening health systems to improve health outcomes: WHO's framework for action*,
  World Health Organization, Geneva

- Flottorp, S.A., Oxman, A.D., Krause, J.
  A checklist for identifying determinants of practice: a systematic review and synthesis of frameworks and taxonomies of factors that prevent or enable improvements in healthcare professional practice
  (2013) *Implement Sci*, 8, p. 35.

- (2021),
  Oct

- Whitaker, J., Nepogodiev, D., Leather, A., Davies, J.
  Assessing barriers to quality trauma care in low and middle-income countries: a Delphi study
  (2020) *Injury*, 51, pp. 278-285.

- Beane, A., Salluh, J.I.F., Haniffa, R.
  What Intensive care registries can teach us about outcomes
  (2021) *Curr Opin Crit Care*, 27, pp. 537-543.

- Vukoja, M., Riviello, E., Gavrilovic, S.
  A survey on critical care resources and practices in low- and middle-income countries
  (2014) *Glob Heart*, 9 (3), pp. 337-342.

- Manafò, E., Petermann, L., Vandall-Walker, V., Mason-Lai, P.
  Patient and public engagement in priority setting: a systematic rapid review of the literature
  (2018) *PLoS ONE*, 13 (3).

- Petti, C.A., Polage, C.R., Quinn, T.C.
  Laboratory medicine in Africa: a barrier to effective health care
  (2006) *Clin Infect Dis*, 42, pp. 377-382.

- Alemnji, G.A., Zeh, C., Yao, K., Fonjungo, P.N.
  Strengthening national health laboratories in sub-Saharan Africa: a decade of remarkable progress
  (2014) *Trop Med Int Health*, 19, pp. 450-458.

- Asmelash, D., Worede, A., Teshome, M.
  Extra-analytical clinical laboratory errors in Africa: a systematic review and meta-analysis

(2020) *EJIFCC*, 31, pp. 208-224.
PID: 33061876

- Weiss, C.H., Moazed, F., McEvoy, C.A.
Prompting physicians to address a daily checklist and process of care and clinical outcomes
(2011) *Am J Respir Crit Care Med*, 184, pp. 680-686.

- Yadav, H., Shah, D., Sayed, S.
Availability of essential diagnostics in ten low-income and middle-income countries: results from national health facility surveys
(2021) *Lancet Glob Health*, 9, pp. e1553-e1560.

- Alonge, O., Lin, S., Igusa, T., Peters, D.H.
Improving health systems performance in low- and middle-income countries: a system dynamics model of the pay-for-performance initiative in Afghanistan
(2017) *Health Policy Plan*, 32, pp. 1417-1426.

- Chalkley, M., Mirelman, A.J., Siciliani, L., Suhrcke, M.
Paying for performance for health care in low- and middle-income countries: An economic perspective
(2018) *Global Health Economics. World Scientific*, pp. 157-190.

- Ider, B.-E., Adams, J., Morton, A.
Gaming in infection control: a qualitative study exploring the perceptions and experiences of health professionals in Mongolia
(2011) *Am J Infect Control*, 39, pp. 587-594.

- Al-Tawfiq, J.A., Tambyah, P.A.
Healthcare associated infections (HAI) perspectives
(2014) *J Infect Public Health*, 7, pp. 339-344.

- Vijayaraghavan, B.K.T., Priyadarshini, D., Rashan, A.
Validation of a simplified risk prediction model using a cloud based critical care registry in a lower-middle income country
(2020) *PLoS ONE*, 15.

- Aminiahidashti, H., Bozorgi, F., Montazer, S.H.
Comparison of APACHE II and SAPS II scoring systems in prediction of critically ill patients' outcome
(2017) *Emergency (Tehran)*, 5.

- Dehnavieh, R., Haghdoost, A., Khosravi, A.
The District Health Information System (DHIS2): a literature review and meta-synthesis of its strengths and operational challenges based on the experiences of 11 countries
(2019) *HIM J*, 48, pp. 62-75.

- Honda, C.K.Y., Freitas, F.G.R., Stanich, P.
Nurse to bed ratio and nutrition support in critically Ill patients
(2013) *Am J Crit Care*, 22, pp. e71-e78.

- Morita, K., Matsui, H., Yamana, H.
Association between advanced practice nursing and 30-day mortality in mechanically ventilated critically ill patients: a retrospective cohort study
(2017) *J Crit Care*, 41, pp. 209-215.

- Brown, S.E.S., Ratcliffe, S.J., Halpern, S.D.
Assessing the utility of ICU readmissions as a quality metric: an analysis of changes mediated by residency work-hour reforms
(2015) *Chest*, 147, pp. 626-636.

- Hill, A.D., Fowler, R.A., Burns, K.E.A.
Long-term outcomes and health care utilization after prolonged mechanical ventilation
(2017) *Ann ATS*, 14, pp. 355-362.

- (2019) *NHSN Patient Safety Component Manual 2019*,

- Zilberberg, M.D., Shorr, A.F.
Ventilator-associated pneumonia: the clinical pulmonary infection score as a surrogate for diagnostics and outcome
(2010) *Clin Infect Dis*, 51, pp. S131-S135.

- Brown, S.E.S., Ratcliffe, S.J., Halpern, S.D.
An empirical comparison of key statistical attributes among potential ICU quality indicators
(2014) *Crit Care Med*, 42, pp. 1821-1831.

- Gastmeier, P., Sohr, D., Geffers, C.
Mortality risk factors with nosocomial Staphylococcus aureus infections in intensive care units: results from the German nosocomial infection surveillance system (KISS)
(2005) *Infection*, 33, pp. 50-55.

- Zimmerman, J.E., Kramer, A.A., McNair, D.S.
Intensive care unit length of stay: benchmarking based on acute physiology and chronic health evaluation (APACHE) IV
(2006) *Crit Care Med*, 34, pp. 2517-2529.

- Moore, L., Stelfox, H.T., Turgeon, A.F.
Hospital length of stay after admission for traumatic injury in Canada: a multicenter cohort study
(2014) *Ann Surg*, 260, pp. 179-187.

- Reiter, A., Mauritz, W., Jordan, B.
Improving risk adjustment in critically Ill trauma patients: the TRISS-SAPS score
(2004) *J Trauma Acute Care Surg*, 57, pp. 375-380.

Correspondence Address
Pari V.; Chennai Critical Care Consultants, India; email: vrindha.pari@gmail.com

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