



**MAKERERE UNIVERSITY**  
**COLLEGE OF HEALTH SCIENCES**

# ICU MORTALITY IN SUB-SAHARAN AFRICA: THE MODIFIED SEQUENTIAL ORGAN FUNCTION ASSESSMENT SCORE

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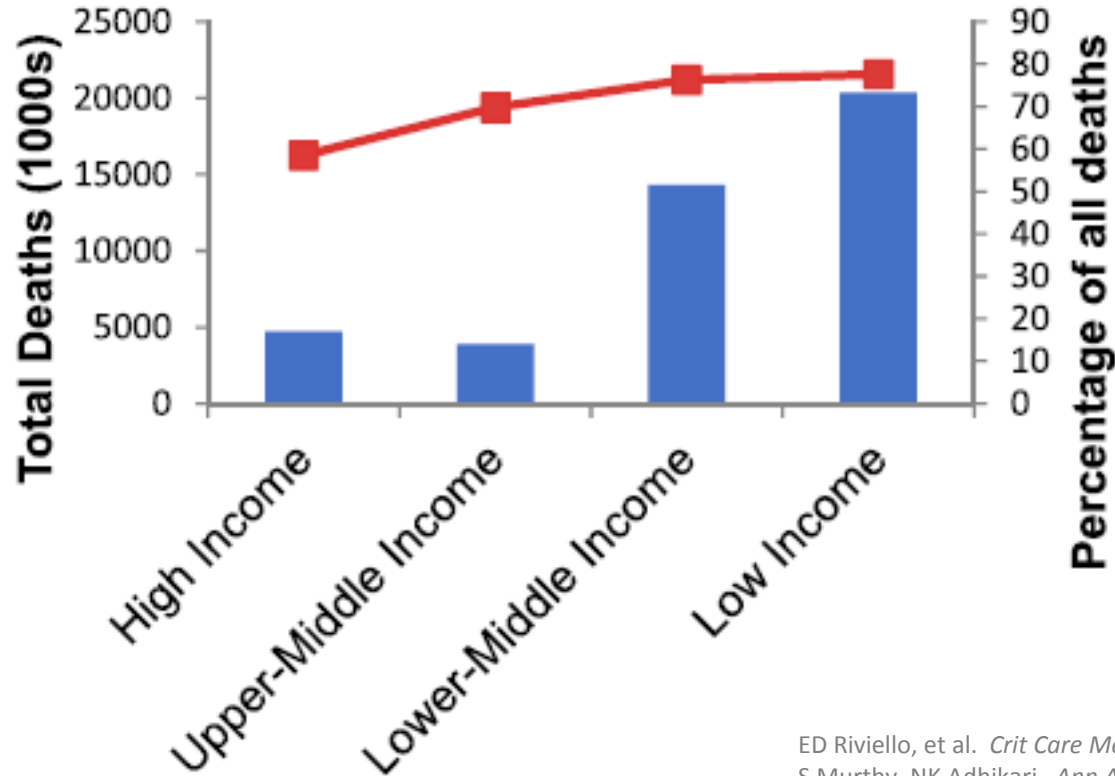
**SEOUL, 2015**

# Critical Care in Sub-Saharan Africa?

- Significant M&M can be averted with cost-effective interventions
  - Sepsis, trauma, obstetric emergencies
  - The human resource (regardless of the available equipment) is the most important resource for critical care



# Deaths preventable with Critical Care



# Critical Care Epidemiology

- **US:** 5 million ICU admissions/yr
- **Uganda:** 1000 “ICU admissions/yr”
- Can a scoring system be used to identify critically-ill patients in resource-constrained settings?/
- Can a scoring system help allocate resources to improve health outcomes?



# Scoring Systems

- Optimization is imperative – a scoring system is needed
- APACHE was the first scoring tool (Bouch & Thompson, 2008)
- SOFA score- simple, objective and accurate (Vincent, 1998; Ferreira, 2001)

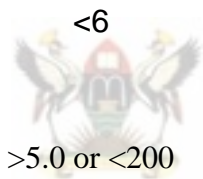


# Scoring Systems

- Blood gas analysis is a rarity in resource limited settings
  - Most popular scoring systems require blood gas analysis
- Modified SOFA score; PaO<sub>2</sub>/FiO<sub>2</sub> can be replaced with SPO<sub>2</sub>/FiO<sub>2</sub> (Pandharipande, 2009)
- 6 organ systems; CNS, CVS, RS, Liver, Renal, Coagulation
  - 0-normal, 4- worst organ function; total 0-24



SOFA score	0	1	2	3	4
<b>Respiratory</b> SPO <sub>2</sub> /FIO <sub>2</sub>	>400	221–301	142–220	67–141	<67
<b>Coagulation</b> Platelets 10 <sup>3</sup> /mm <sup>3</sup>	>150	<150	<100	<50	<20
<b>Liver</b> Bilirubin (mg/dL)	<1.2	1.2–1.9	2.0–5.9	6.0–11.9	>12.0
<b>Cardiovascular</b> Hypotension	No hypotension	MAP <70	Dopamine </=5ug/kg/min or dobutamine (any dose)	Dopamine >5ug/kg/min or norepinephrine </=0.1ug/kg/min	Dopamine >15ug/kg/min or norepinephrine >0.1ug/kg/min
<b>CNS</b> Glasgow Coma Score	15	13–14	10–12	6–9	<6
<b>Renal</b> Creatinine (mg/dL)/urine output(ml/d)	<1.2	1.2–1.9	2.0–3.4	3.5–4.9 or <500	>5.0 or <200



# Study Objectives

- To evaluate the feasibility of the mSOFA score in Mulago National Referral Hospital general ICU
- To determine the correlation between the mSOFA scores and mortality in patients admitted to the Mulago Hospital ICU in a year





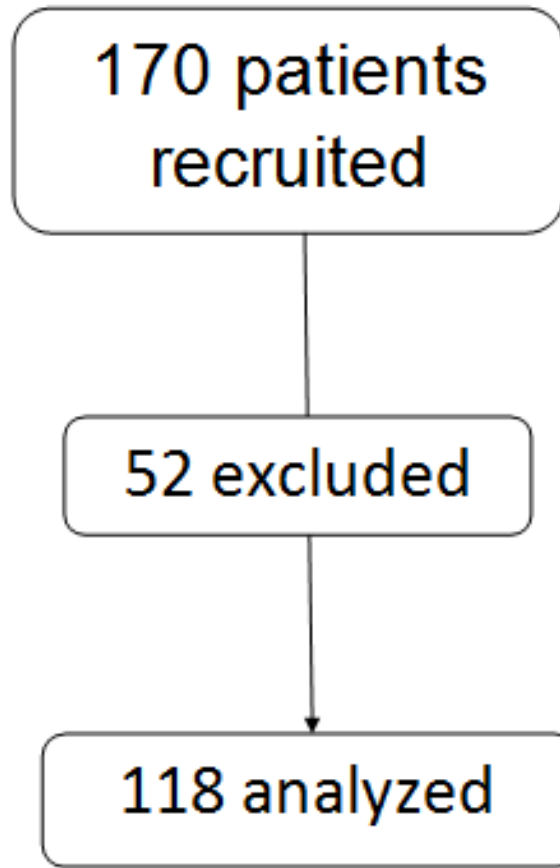
# Methods

- Prospective observational cohort study, MNRH General ICU
  - One year period; Feb, 2014-Jan, 2015
- Consecutively enrolled >12yrs; excluded postop <48hrs, low risk monitoring
- Collected demographic, laboratory and clinical data
  - mSOFA score on admission and at 48hours, follow-up til discharge/death
- Primary outcome; Mortality

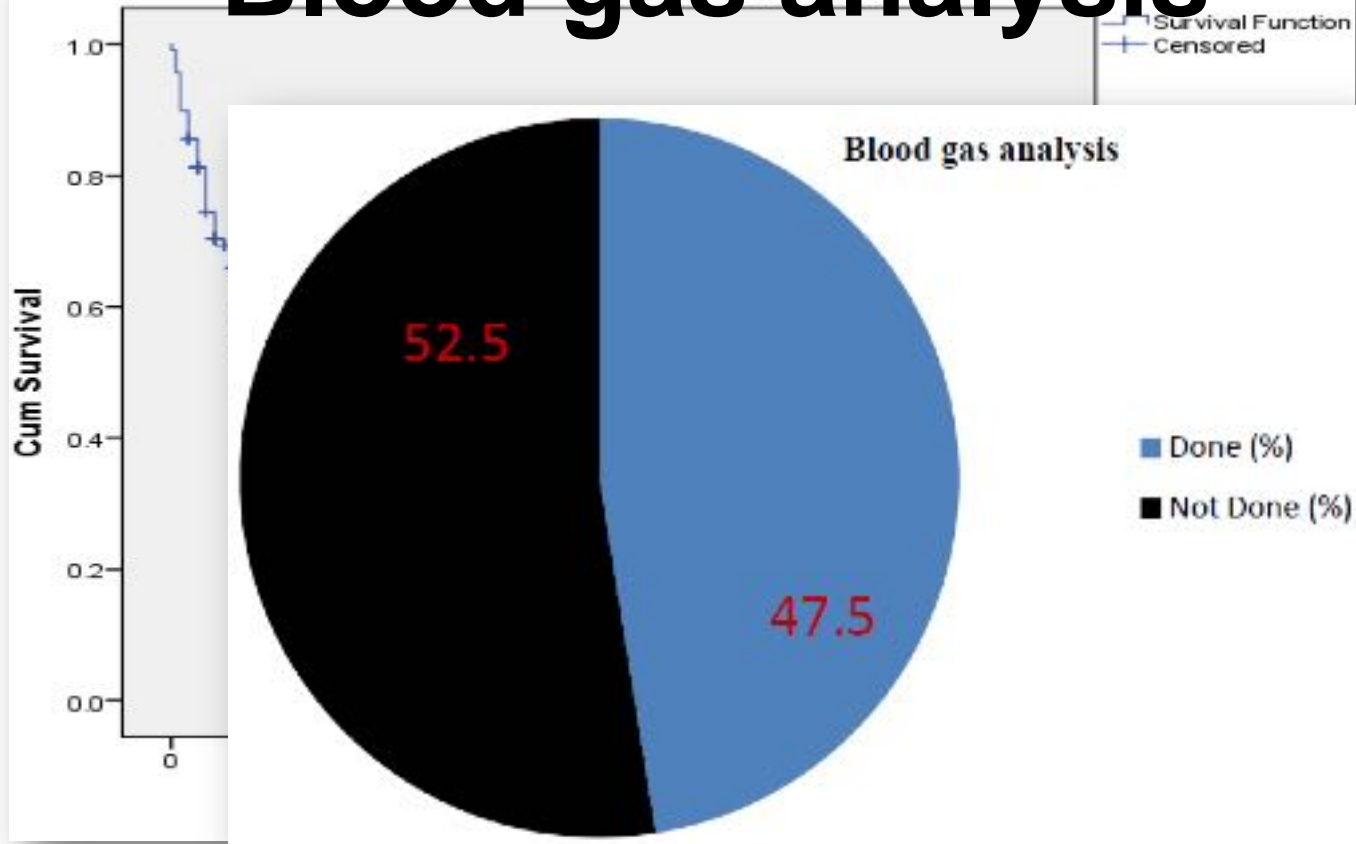


# Population Characteristics

- ICU mortality 47
  - Median age 34
  - Median Ventilator days 12
  - Median LOS; 6
- Reasons for admission
  - Respiratory failure
  - Severe sepsis/septic shock
  - Severe head injury



# Blood gas analysis



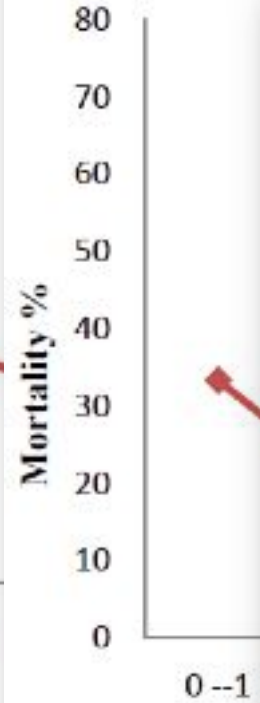
- Median survival time of 12 days with (95% CI 6.38-17.62)



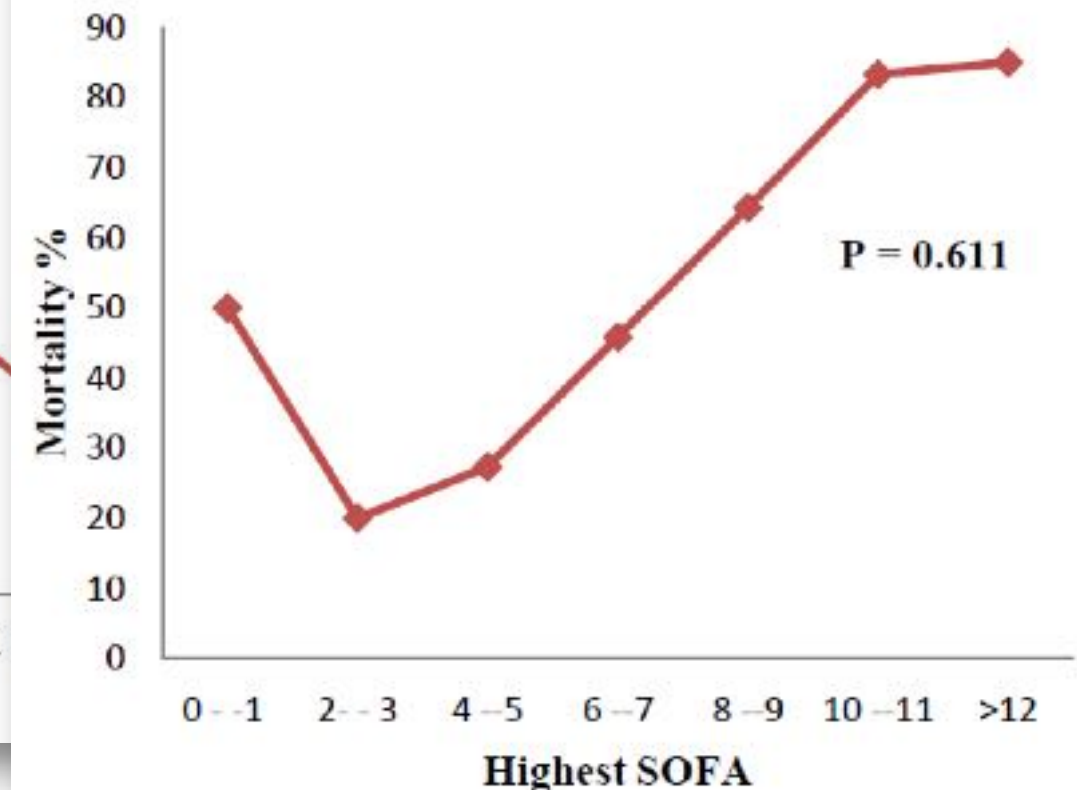
Mortality vs. Initial SOFA



Mortality vs. Mean SOFA



Mortality vs. Highest SOFA



- Initial
- Mean
- Highest
- Delta

# Limitations

- Ideally SOFA scores should be measured daily
- Inadequate power to show significant association at multivariate analysis
- Generalizability limited



# Conclusions/Recommendations

- mSOFA score is feasible in our setting
- It can be used to differentiate between survivors and non-survivors
- A larger study is needed, preferably multi-centered to determine utility in resource allocation to improve outcomes for critically ill patients

