ICU Efficiency: ASER

Stichting Nationale Intensive Care Evaluatie

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Disclosure

Nothing to disclose in relation to this talk

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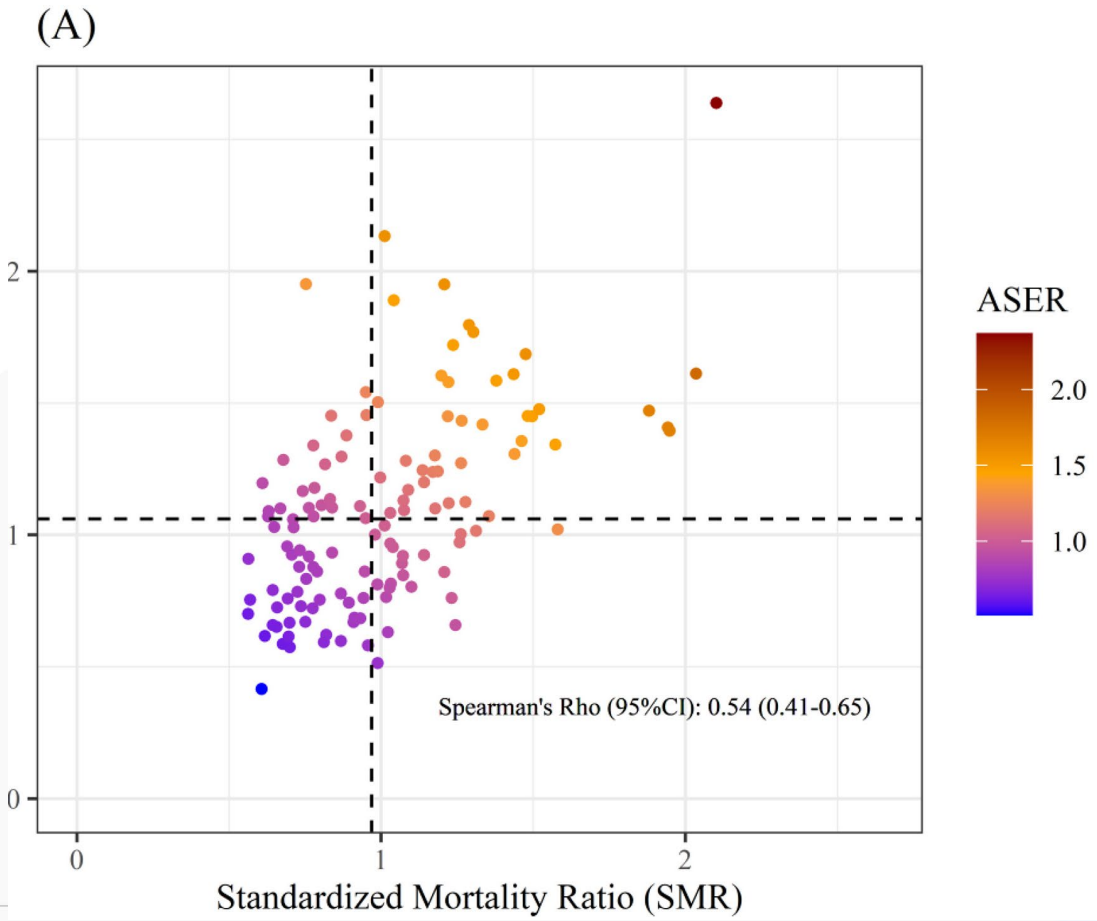
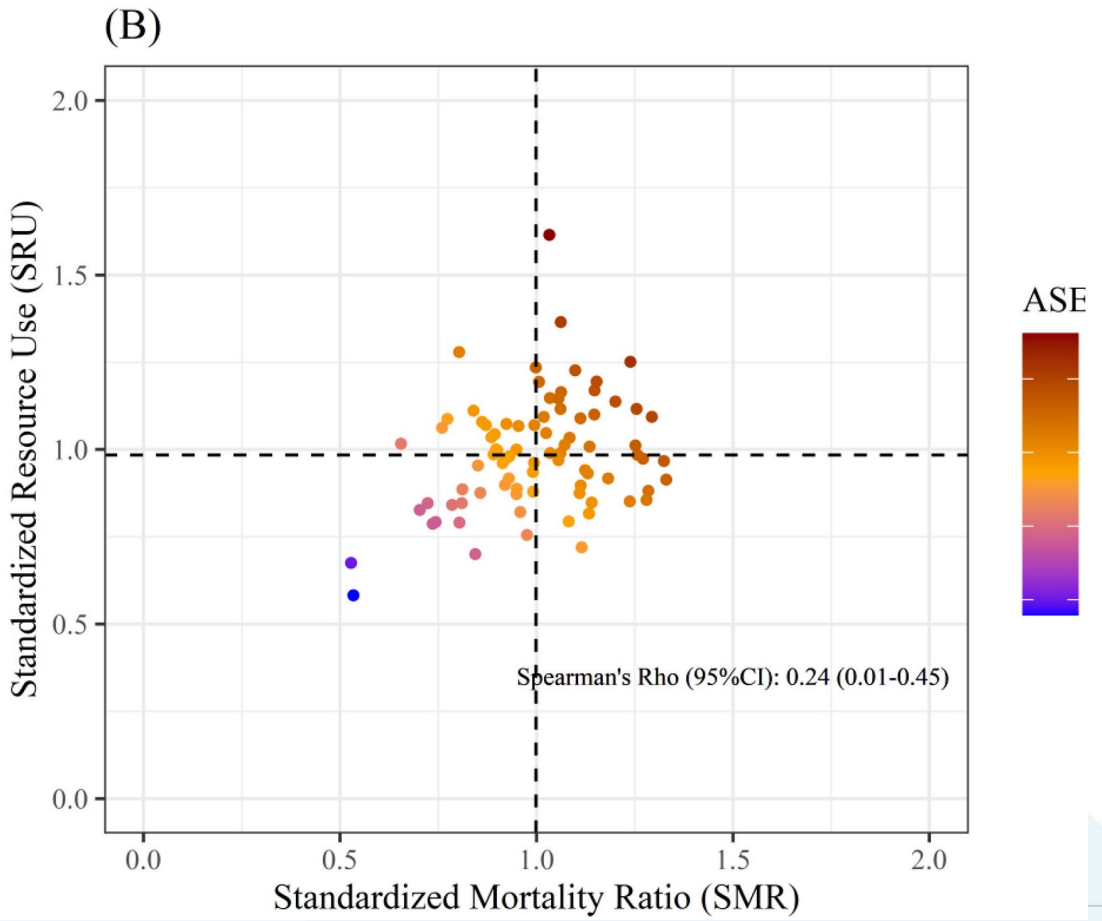
Why ICU Efficiency?

- Efficiency balances mortality with resource use
  - Both standardized for casemix
- Variation highlights opportunities for improvement
  - Room for improvement?
- Benchmarking allows comparison and learning

A: Brasil and Urugay

B: Netherlands





Supplementary Table 2. Distribution of performance metrics (SMR, SRU and ASER) per units stratified by efficiency groups

Metrics	Overall	Most Efficient	Underachieving	Overachieving	Least Efficient
Brazil and Uruguay					
No. Of ICUs	128	42 (33%)	22 (17%)	22 (17%)	42 (33%)
SMR					
Median (IQR)	0.97 (0.76, 1.21)	0.73 (0.68, 0.82)	1.07 (1.02, 1.23)	0.79 (0.75, 0.86)	1.25 (1.15, 1.46)
Mean (SD)	1.01 (0.32)	0.75 (0.11)	1.12 (0.15)	0.79 (0.11)	1.33 (0.29)
SRU					
Median (IQR)	1.06 (0.79, 1.30)	0.75 (0.66, 0.87)	0.88 (0.80, 0.97)	1.17 (1.10, 1.33)	1.41 (1.24, 1.60)
Mean (SD)	1.09 (0.38)	0.76 (0.14)	0.86 (0.14)	1.25 (0.21)	1.45 (0.32)
ASER					
Median (IQR)	0.99 (0.82, 1.21)	0.76 (0.69, 0.82)	0.99 (0.93, 1.03)	0.98 (0.94, 1.08)	1.39 (1.20, 1.52)
Mean (SD)	1.05 (0.31)	0.75 (0.09)	0.99 (0.12)	1.02 (0.13)	1.39 (0.25)
The Netherlands					
No. Of ICUs	83	25 (30%)	17 (20.5%)	17 (20.5%)	24 (29%)
SMR					
Median (IQR)	1 (0.89, 1.12)	0.86 (0.79, 0.95)	1.14 (1.12, 1.27)	0.89 (0.84, 0.92)	1.08 (1.05, 1.15)
Mean (SD)	1 (0.18)	0.85 (0.13)	1.19 (0.09)	0.87 (0.09)	1.11 (0.08)
SRU					
Median (IQR)	0.98 (0.88, 1.08)	0.87 (0.79, 0.92)	0.9 (0.85, 0.94)	1.07 (1.02, 1.08)	1.12 (1.04, 1.17)
Mean (SD)	0.99 (0.16)	0.85 (0.1)	0.89 (0.07)	1.07 (0.08)	1.14 (0.14)
ASER					
Median (IQR)	0.99 (0.92, 1.09)	0.87 (0.78, 0.92)	1.03 (0.99, 1.08)	0.97 (0.95, 1)	1.11 (1.07, 1.17)
Mean (SD)	0.99 (0.14)	0.85 (0.11)	1.04 (0.07)	0.97 (0.06)	1.12 (0.08)

ASER: Average Standardized Efficiency Ratio; ICU: Intensive Care Unit; IQR: Interquartile range; SD: Standard Deviation; SMR: Standardized Mortality Ratio; SRU: Standardized Resource USE

Bastos LSL, Wortel SA, de Keizer NF, Bakhshi-Raiez F, Salluh JIF, Dongelmans DA, Zampieri FG, Burghi G, Abu-Hanna A, Hamacher S, Bozza FA, Soares M. Comparing continuous versus categorical measures to assess and benchmark intensive care unit performance. J Crit Care. 2022 Aug;70:154063. doi: 10.1016/j.jcrc.2022.154063. Epub 2022 May 13. PMID: 35576635.

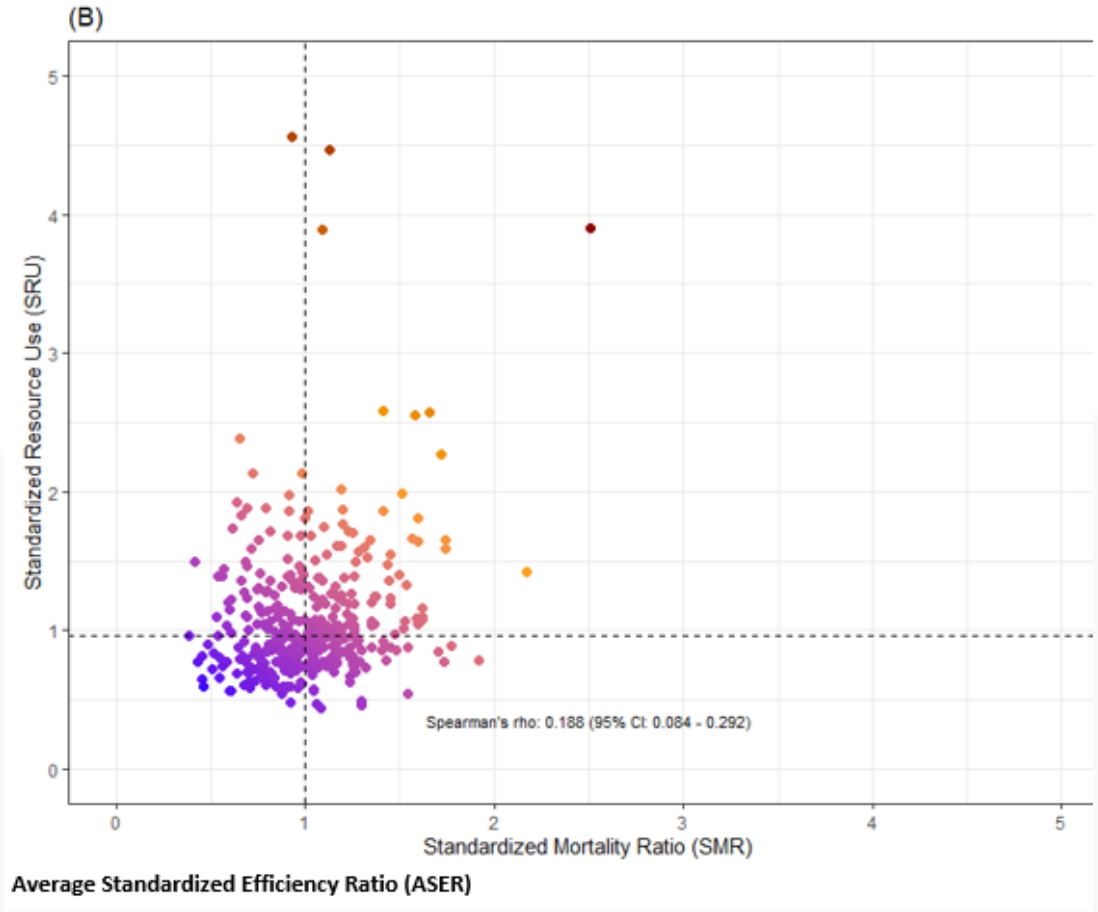
Methods Netherlands-Italy

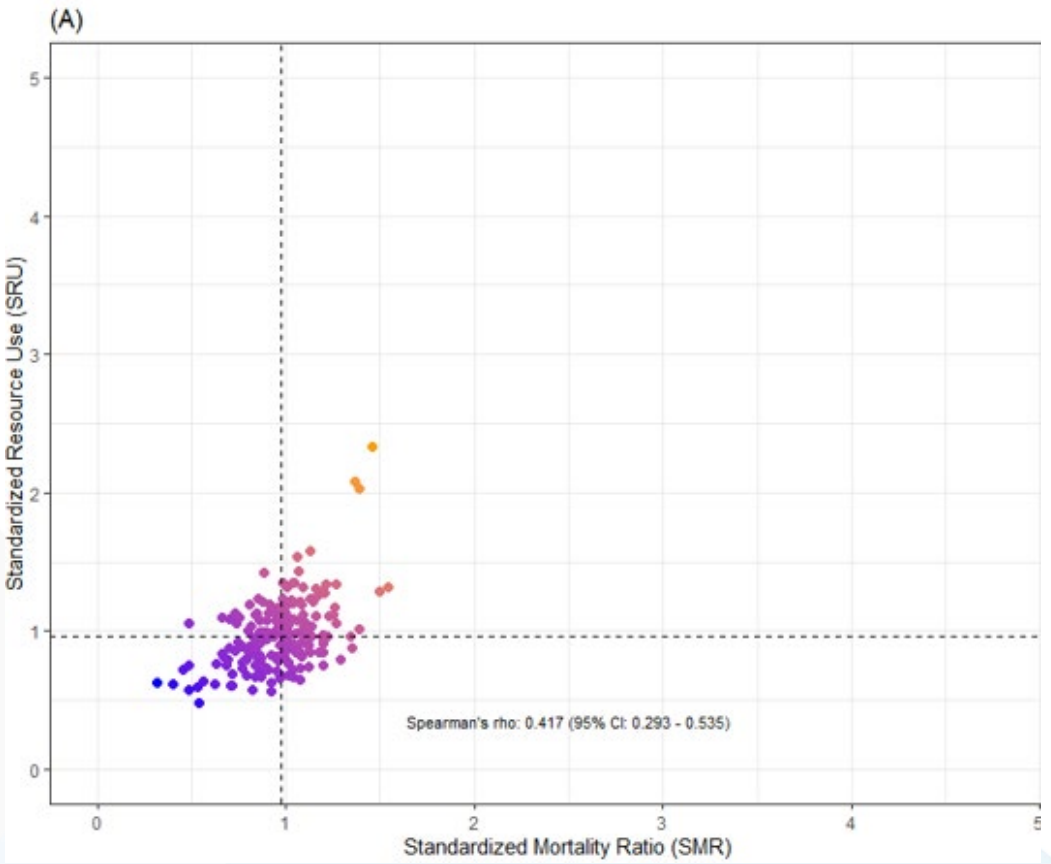
- Data: NICE (NL) & GiViTI (IT) registries, 2022–2024
- Exclusions: pediatric, SAPS II criteria
- Metrics: SMR, SRU, ASER (average of SMR & SRU)
- Analyses: Weighted regression, correlation (Spearman’s rho)

Results

- >200,000 admissions (68 Dutch ICUs, 124 Italian ICUs)
- Medians similar (SMR ~1, SRU <1, ASER ~1)
- Wider spread in Italy (SRU & ASER)
- Correlation stronger in NL (rho=0.42) vs IT (rho=0.19)

Average Standardized Efficiency Ratio (ASER)





Implications

- ASER is robust for cross-country benchmarking
- Netherlands: relatively consistent efficiency
- Italy: greater heterogeneity across ICUs
- Median values about the same
- Next step: link efficiency to organizational/system factors

Conclusion

Ultimately, the goal is not cost-cutting,
but to ensure we deliver high-value care with the resources available

Thank you for your attention