



GiViTI - Gruppo italiano per la Valutazione  
degli Interventi in Terapia Intensiva

# SOFA 2: What's New ?

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**Meeting GiViTI 2025**

8 - 9 - 10 ottobre



## **Disclosures**

- **Member and co-founder BricNet and LOGIC (non-profit)**
- **Founder and shareholder Epimed Solutions**
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## The SOFA (Sepsis-related Organ Failure Assessment) score to describe organ dysfunction/failure

On behalf of the Working Group on Sepsis-Related Problems of the European Society of Intensive Care Medicine

Intensive Care Med (1996) 22:707–710

**Table 3** The SOFA score

SOFA score	1	2	3	4
<i>Respiration</i>				
PaO <sub>2</sub> /FiO <sub>2</sub> , mmHg	< 400	< 300	< 200 —— with respiratory support ——	< 100
<i>Coagulation</i>				
Platelets × 10 <sup>3</sup> /mm <sup>3</sup>	< 150	< 100	< 50	< 20
<i>Liver</i>				
Bilirubin, mg/dl (μmol/l)	1.2–1.9 (20–32)	2.0–5.9 (33–101)	6.0–11.9 (102–204)	> 12.0 (< 204)
<i>Cardiovascular</i>				
Hypotension	MAP < 70 mmHg	Dopamine ≤ 5 or dobutamine (any dose) <sup>a</sup>	Dopamine > 5 or epinephrine ≤ 0.1 or norepinephrine ≤ 0.1	Dopamine > 15 or epinephrine > 0.1 or norepinephrine > 0.1
<i>Central nervous system</i>				
Glasgow Coma Score	13–14	10–12	6–9	< 6
<i>Renal</i>				
Creatinine, mg/dl (μmol/l) or urine output	1.2–1.9 (110–170)	2.0–3.4 (171–299)	3.5–4.9 (300–440) or < 500 ml/day	> 5.0 (> 440) or < 200 ml/day

<sup>a</sup> Adrenergic agents administered for at least 1 h (doses given are in μg/kg·min)



A lot has changed in 30 years

# A lot has changed in 30 years

Table 3

SOFA score		2	3	4
<i>Respiration</i>				
PaO <sub>2</sub> /FiO <sub>2</sub> , mmHg	< 400	< 300	< 200 with respiratory support	< 100
<i>Coagulation</i>				
Platelets × 10 <sup>3</sup> /mm <sup>3</sup>	< 150	< 100	< 50	< 20
<i>Liver</i>				
Bilirubin, mg/dl (μmol/l)	1.2 – 1.9 (20 – 32)	2.0 – 5.9 (33 – 101)	6.0 – 11.9 (102 – 204)	> 12.0 (> 204)
<i>Cardiovascular</i>				
Hypotension	MAP < 70 mmHg	Dopamine ≤ 5 or dobutamine (any dose) <sup>a</sup>	Dopamine > 5 or epinephrine ≤ 0.1 or norepinephrine ≤ 0.1	Dopamine > 15 or epinephrine > 0.1 or norepinephrine > 0.1
<i>Central nervous system</i>				
Glasgow Coma Score	13 – 14	10 – 12	6 – 9	< 6
<i>Renal</i>				
Creatinine, mg/dl (μmol/l) or urine output	1.2 – 1.9 (110 – 170)	2.0 – 3.4 (171 – 299)	3.5 – 4.9 (300 – 440) or < 500 ml/day	> 5.0 (> 440) or < 200 ml/day

<sup>a</sup> Administered for at least 1 h (doses given are in μg/kg·min)

what if no  
arterial  
gas?

non-  
invasive?

much less  
used

ECMO?

what about  
newer  
options?

ECMO?  
VAD?

what about  
RRT?

# A lot has changed in 30 years

**Table 3** The SOFA score

SOFA score	1	2	3	4
<i>Respiration</i>				
PaO <sub>2</sub> /FiO <sub>2</sub> , mmHg	<400	<300	<200 —— with respiratory support ——	<100
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<i>Cardiovascular</i>				
Hypotension	MAP < 70 mmHg	Dopamine > 5 or dopamine > 10	Dopamine > 5 or epinephrine ≤ 0.1 or norepinephrine ≤ 0.1	Dopamine > 15 or epinephrine > 0.1 or norepinephrine > 0.1
<i>Central nervous system</i>				
Glasgow Coma Score	13 – 14	10 – 12	7 – 9	<6
<i>Renal</i>				
Creatinine, mg/dl (μmol/l) or urine output		2.0 – 3.4 (171 – 299)	3.5 – 9 (300 – 440) or < 500 ml/day	> 5.0 (> 440) or < 200 ml/day

appropriate  
breakpoints?

what about  
chronic organ  
dysfunction?

impact of  
sedation?

<sup>a</sup> Adrenergic agents administered for at least 1 h (doses given are in μg/kg·min)





# Some things should remain the same

1. Organ dysfunction/failure is a process rather than an event. Hence, it should be seen as a continuum and should not be described simply as “present” or “absent.” Hence, the assessment should be based on a scale.

# Some things should remain the same

**Table 1** Ideal variables for describing organ dysfunction/failure

- 
- Objective
  - Simple, easily available, but reliable
  - Obtained routinely and regularly in every institution
  - Specific for the function of the organ considered
  - Continuous variable
  - Independent of the type of patients
  - Independent of the therapeutic interventions
- 

**Table 2** Differences between commonly used scoring systems and the SOFA score

Scoring systems	SOFA score
Evaluate risk of mortality Aim = prediction Often complex Does not individualize the degree of dysfunction/failure of each organ usually obtained early after admission	Evaluate morbidity Aim = description Simple, easily calculated Does individualize the degree of dysfunction/failure of each organ obtained daily



# Time for SOFA 2

*Critical Care Science*  
<https://doi.org/10.62675/2965-2774.20250067>

VIEWPOINT

## **The upcoming SOFA 2.0 score: a roadmap for future developments in critical care?**

Bruno Adler Maccagnan Pinheiro Besen<sup>1,2</sup> , Andre C Kalil<sup>3</sup> , Elisa Estenssoro<sup>4,5</sup> , Pedro Póvoa<sup>6,7,8</sup> 

**Critical Care Science. 2025;37:e20250067**



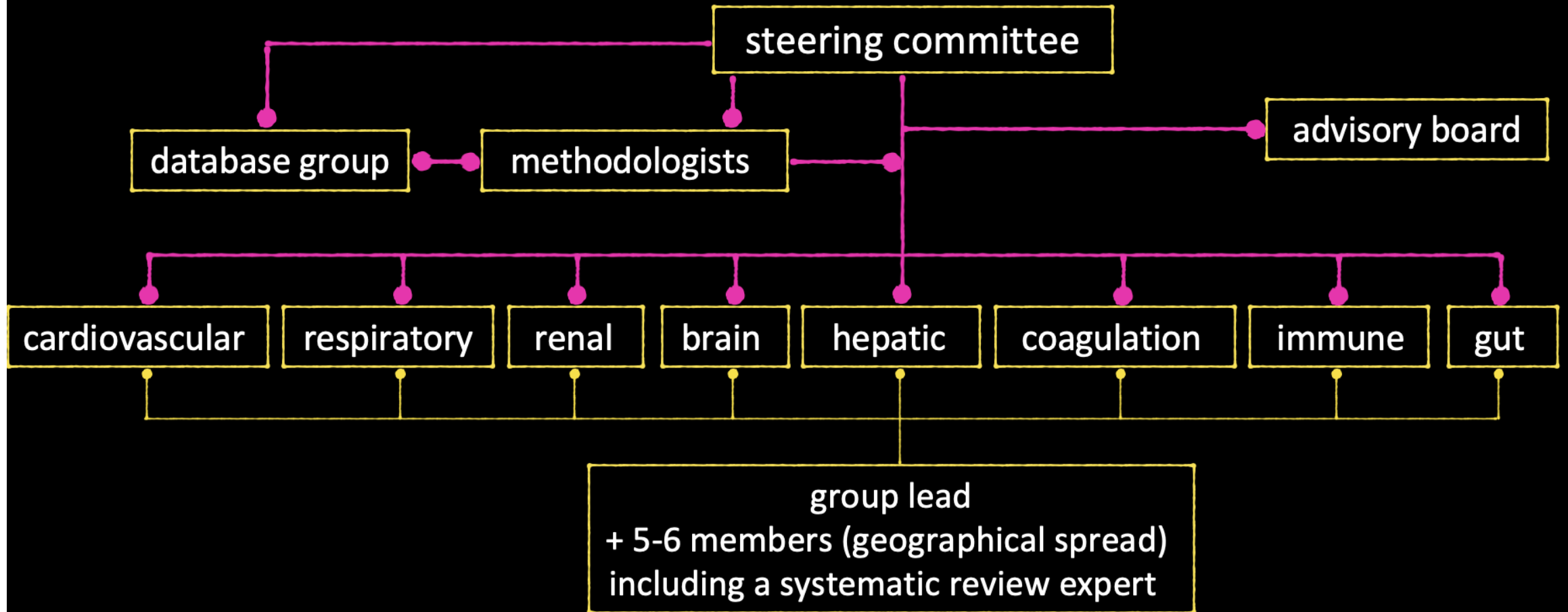
# Main Principles

- ❖ maintain core components
    - ❖ Simple to score
    - ❖ Use routinely measured variables
    - ❖ Measurable daily
    - ❖ Measurable worldwide (including low-resource settings)
    - ❖ Descriptor of degree and severity of organ dysfunction
      - ❖ - should have predictive validity, but not primarily a mortality prediction score
-

# Main Principles

- ❖ • consider new variables within traditional organ system domains
  - ❖ • consider adding new domains (gastrointestinal, immune)
  - ❖ • .. informed by systematic reviews/metanalyses, validated by Delphi rounds
  - ❖ • data-driven approach using large geographically-diverse databases to validate:
    - ❖ • variables
    - ❖ • cut-offs
    - ❖ • final score
  - ❖ • provide clear guidance on how to consider chronic dysfunction, sedation etc.
-

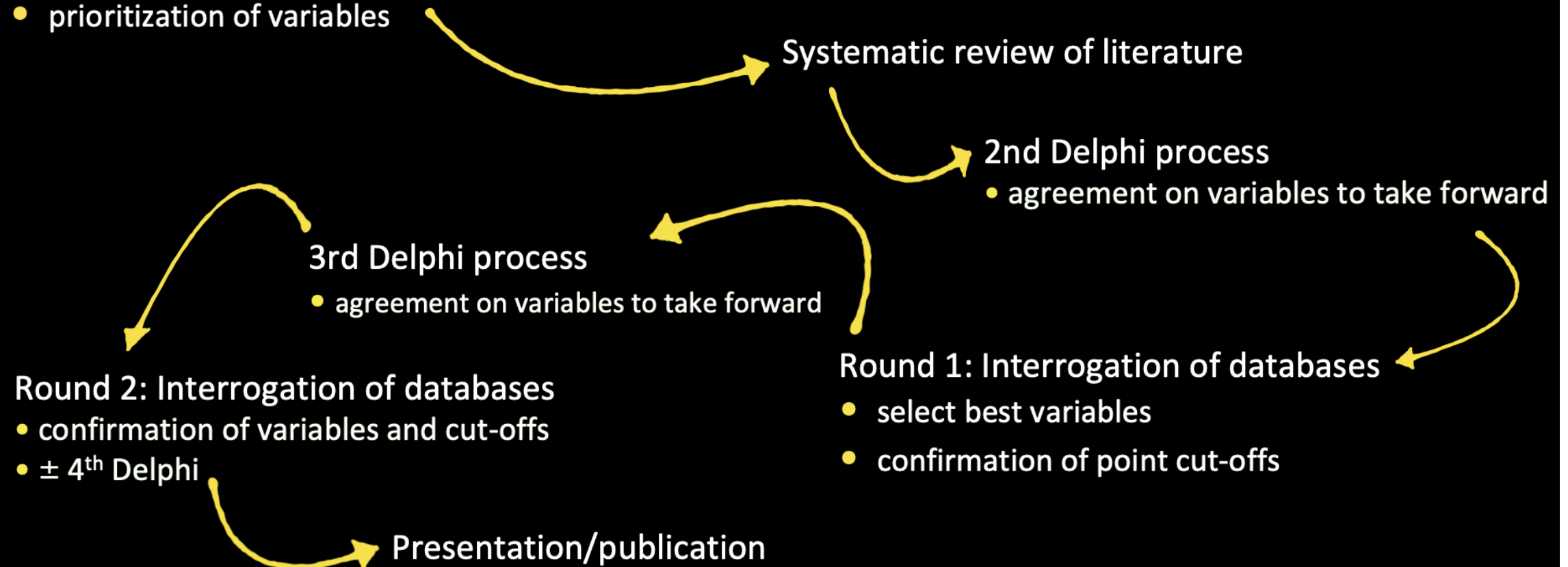
# SOFA-2 STRUCTURE



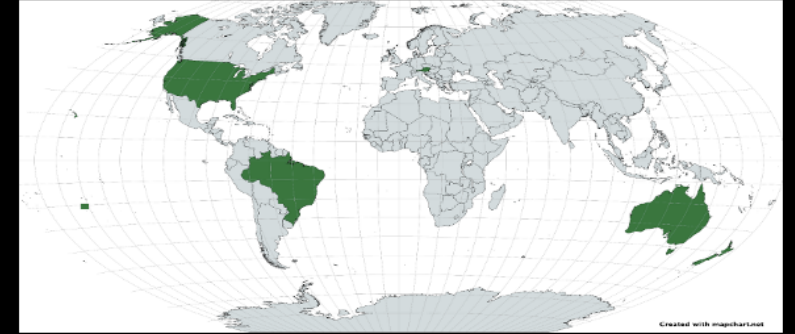
# SOFA-2 PROCESS

Delphi process by each group:

- which regularly scored variables are likely important markers of organ dysfunction severity?
- prioritization of variables



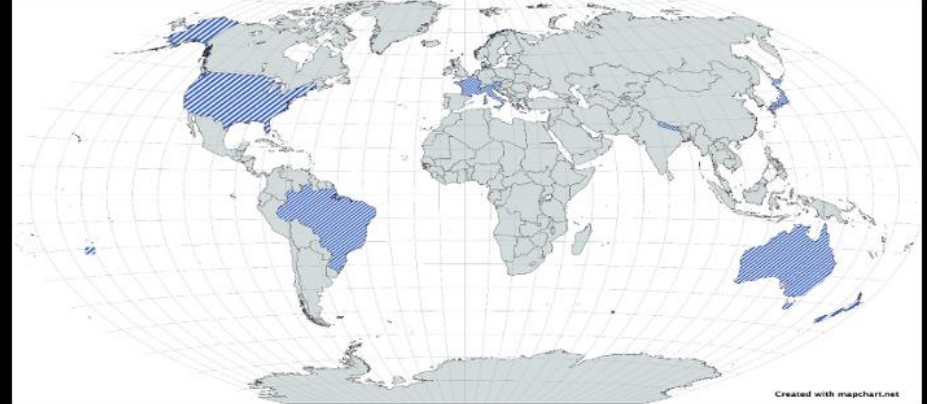
# 1<sup>ST</sup> DATA VALIDATION ROUND



	<b>ANZICS (Australia &amp; New Zealand)</b>	<b>ASDI (Austria)</b>	<b>Kaiser Permanente (USA)</b>	<b>ORCHESTRA (Brazil)</b>
<b>Period</b>	2014-2023	2014-2023	2014-2023	2022-2023
<b>n</b>	1,690,207	406,649	258,515	342,338
<b>Database</b>	National registry	National registry	Electronic healthcare record	National registry

**~2.7 MILLION ICU PATIENTS**





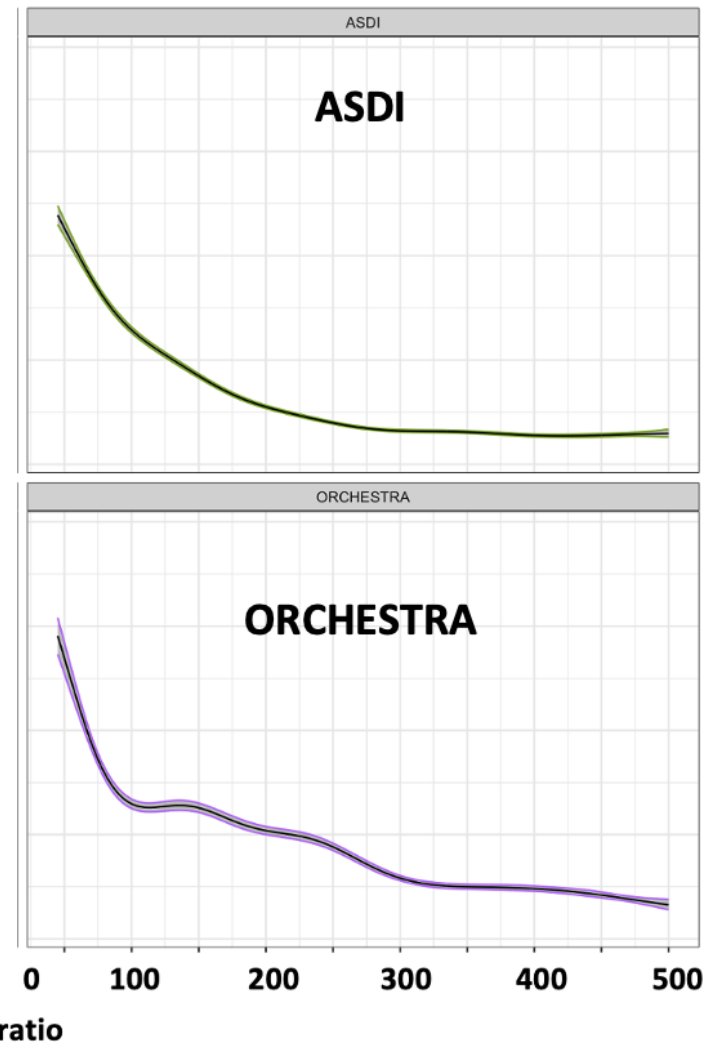
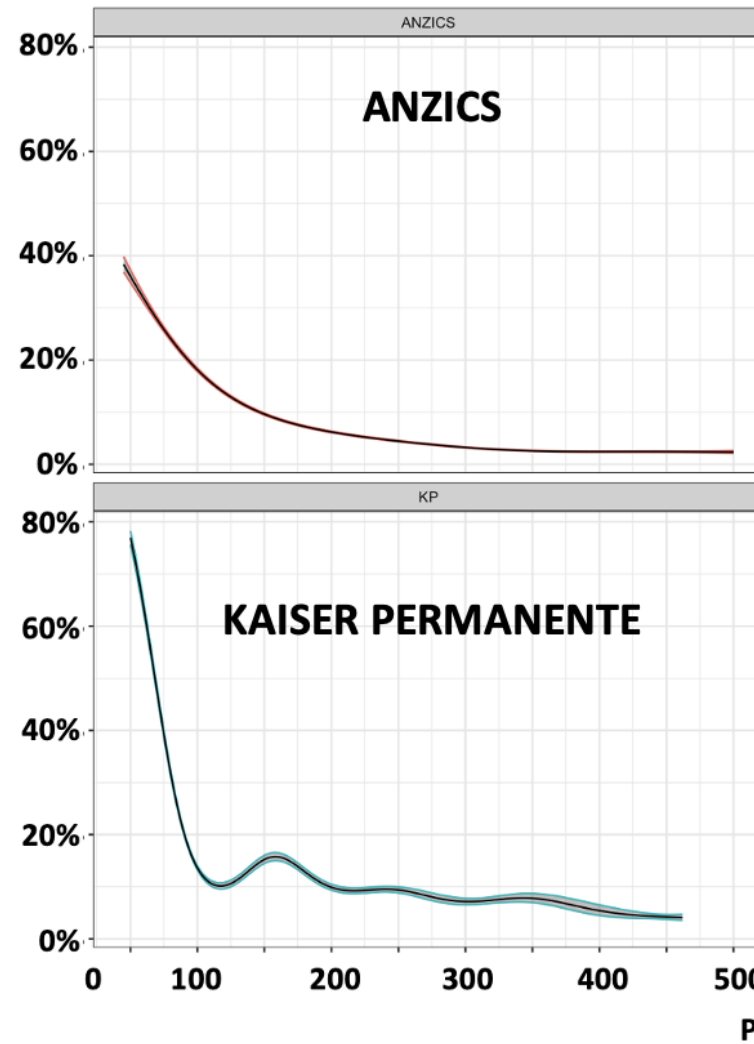
- 2<sup>nd</sup> round of data validation (France, Italy, Japan, Nepal, eICU (USA))

for baseline + longitudinal data

# EXEMPLAR: RESPIRATORY ( $\text{PaO}_2:\text{FiO}_2$ RATIO)

consistent findings seen  
across different databases  
(countries/health systems)

ICU mortality (%)



## SOFA-2 VALIDATION EXERCISE (II)

- variables for Gastrointestinal domain (e.g. (in)tolerance of feed, abdominal catastrophe)  
not clearly associated with outcome (mortality)
- variables for Immune domain (total WBC, lymphocytes) not felt to be accurate descriptors  
of immune dysfunction
- strong recommendation to pursue these as research questions

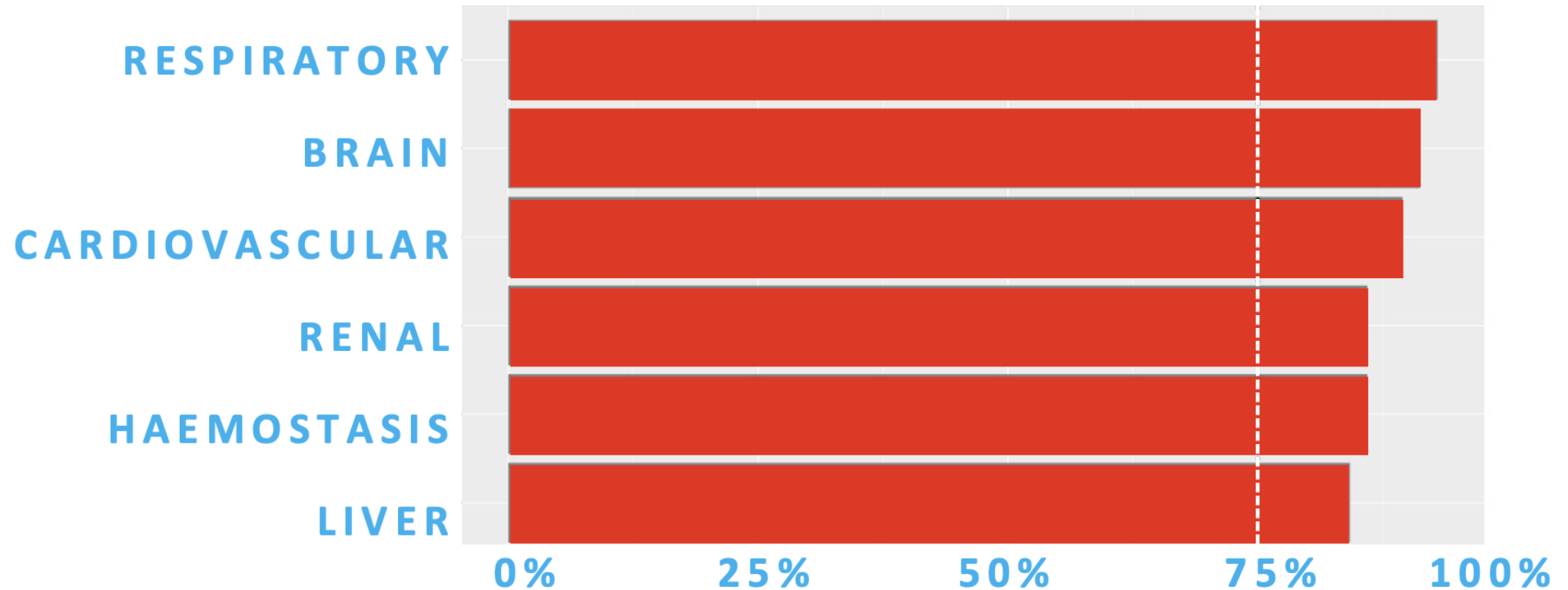
## SOFA-2 VARIABLES

System	Main variable	Other
Respiratory	PaO <sub>2</sub> :FiO <sub>2</sub> (or S:F)	ventilatory/mechanical support (invasive/noninvasive/ECMO)
Cardiovascular	MAP + catecholamine dose	other drugs/mechanical supports
Brain	GCS	drugs for delirium
<u>Haemostasis</u>	platelets	
Renal	urine output, creatinine	renal replacement therapy
Liver	bilirubin	

n.b. #1: breakpoints to be announced after 2<sup>nd</sup> data validation

n.b. #2 : acute, acute-on-chronic and chronic dysfunctions to be all scored similarly

### 3<sup>RD</sup> DELPHI ROUND: AGREE/STRONGLY AGREE



very high agreement for variables and definitions in all domains

# What's next ?

Potential implications are.....

- A qSOFA 2 ?

- ED validation

- Use in trials



# What's next ?

FULL Presentation at the ESICM-LIVES 2025 Hot topics session

# Thanks!

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# Thank you all!

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