Introduction:
An increasing number of less or non-invasive devices provide estimates of cardiac index CI and stroke volume index SVI with acceptable accuracy (low bias), but low precision (high percentage error). Nevertheless, the usefulness of more precise measurements by indicator dilution techniques and strict normal ranges are questioned. Therefore, we investigated the association of CI and SVI derived from transpulmonary thermodilution (TPTD) as well as heart rate HR and their distribution within and without normal ranges (3≤CI≤5L/min; 40≤SVI≤60mL/min; 60≤HR≤90/min) with hospital mortality.

Methods:
We analyzed data of a prospectively maintained database including 927 TPTD-measurements (PiCCO; Pulsion; Germany) of 55 ICU patients. Primary endpoint: hospital mortality of patients with mean values of CI, SVI and HR within and without normal range. Statistics: chi-square test. (SPSS 26).

Results:
Patients: 15 female, 40 male; APACHE II 23±6. Mortality was 61.5%, 30.3%, 55.6% for patients with mean CI below, within and above normal range. Mortality was higher for patients with mean CI outside compared to mean CI inside normal range. (59.1% vs. 30.3%, p=0.034). Mortality was 54.6%, 41.7% and 11.1% for patients with mean SVI below, within and above normal range. Mortality was not different for patients with abnormal mean SVI (41.9% vs. 41.7%, p=0.984). Mortality was 0%, 22.7%, 56.3% for patients with mean HR below, within and above normal range. Mortality was higher for patients with abnormal mean HR (54.6% vs. 22.7%, p=0.019).

Conclusion:
Patients with abnormal mean CI or HR suffer from increased hospital mortality. Abnormality of mean SVI was not associated with mortality. These data support accurate measurement of CI as a haemodynamic target and the normal range defined for CI. Since CI also carries the HR information, CI seems to be the more important target than SVI.
Our data cannot necessarily be interpolated to less invasive and less precise measurements of CI.