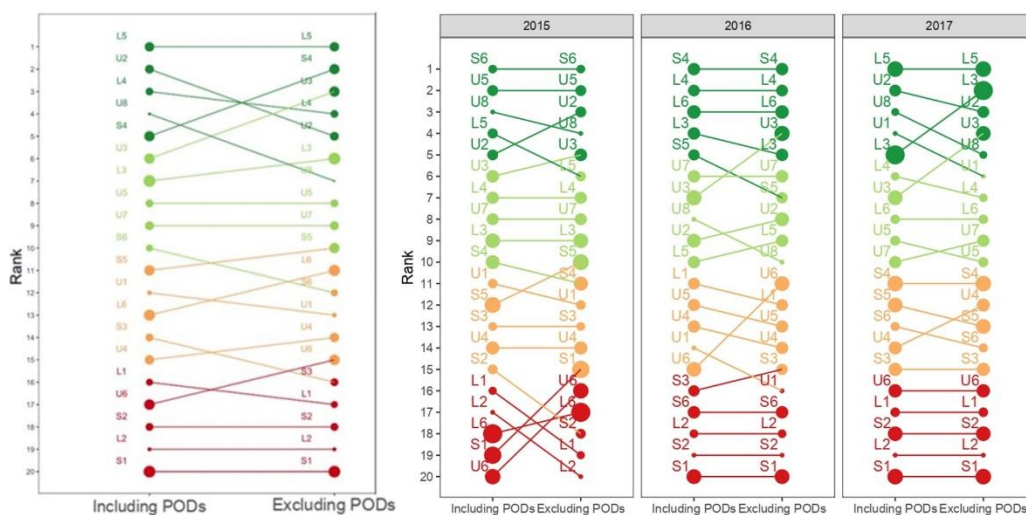


## The influence of potential organ donors on standardised mortality ratio and intensive care unit benchmarking

**Background** The standardised mortality ratio (SMR) is widely used in benchmarking of intensive care units (ICUs). Current risk prediction models may not capture the high likelihood of death of patients with catastrophic brain damage who are admitted to the ICU as potential organ donors (PODs). We examined the effect of PODs on the pooled SMR of all ICUs and on the SMRs of individual ICUs and their rankings.

**Methods** We studied ICU admissions to 20 ICUs in Finland, Estonia, and Switzerland between 2015 and 2017. To calculate the SMR, we used a previously published and validated mortality risk model. We assessed the effect of excluding PODs on the SMRs of the whole study population as well as on the individual ICUs.

**Results** Of 60,047 admissions, 514 (0.9%) patients were admitted as PODs. Out of the 6,738 intensive care patients who died during the hospitalisation, 477 (7%) were admitted to the ICU as PODs. Across the ICUs, the frequency of PODs ranged from 0.5 to 18.3 per 1,000 admissions. The predicted in-hospital mortality of the PODs was 39%, whereas their observed mortality was 93%. The ratio of the pooled SMR of the cohort without PODs to the SMR of the cohort with PODs was 0.96 (95% CI [0.93–0.99]). Benchmark rankings were altered in 70% of the ICUs after POD exclusion (Figure 1).



**Figure 1.**

Alterations to benchmarking hierarchy of ICUs during the study period (left panel) and alterations during each study year separately (right panel).

**Conclusion** Despite their small number, PODs influenced the pooled SMR of the ICUs and resulted in biased benchmark rankings. We suggest excluding PODs when comparing SMRs of ICUs.