Background and aims | Organ dysfunction scores, such as the Pediatric Logistic Organ Dysfunction (PELOD) score developed in 1999, are primarily designed to describe the severity of organ dysfunction. This study was undertaken to update and improve the PELOD score, using a larger and more recent dataset.

Methods | We did a prospective, observational, multicentre cohort study in nine French-speaking multidisciplinary, tertiary-care PICUs of university-affiliated hospitals between June 2006 and October 2007. We collected data on variables considered for the PELOD-2 score at seven time-points after PICU admission: days 1, 2, 5, 8, 12, 16 and 18, plus PICU discharge. For each variable, the most abnormal value observed during each time point was collected. Identification of the best variable cutoffs was performed using bivariate, multivariate regressions and bootstrap process. The outcome was vital status at PICU discharge. We used area under receiver operating characteristic curve (AUC) to evaluate discrimination and Hosmer-Lemeshow goodness-of-fit test to evaluate calibration.

Results | We included 3671 consecutive patients (median age 15.5 months IQR 2.2–70.7). Mortality rate was 6.0% (222 deaths). Discrimination and calibration of the PELOD 2 score were 0.93 and 9.31 (p=0.317) respectively.

Conclusion | We developed and validated the PELOD-2 score, which allows assessment of the severity of cases of MODS in PICU with a continuous scale. The score will be in the public domain, which allows assessment of the severity of cases of MODS in PICU = 9.31 (p < 0.01). For GA22-25 AUC of CRIB/PREM was 0.80/0.70. Lower AUC of all 3 modified scores without BT and/or BE, for instance PREM=0.82 (VLBW) and 0.78 (BW750). AUC of CRIB without influenceable parameters dropped for VLBW from 0.89 to 0.81, for BW750 from 0.77 to 0.66 (compared to modified CRIB-II=0.71, modified PREM=0.73).

Conclusions | Standard CRIB is superior to standard CRIB-II, standard PREM, and all score modifications without influenceable items. No difference exists between the 3 scores when omitting influenceable parameters. For ELBW infants < 750g all standard scores are equally predictive, but without influenceable parameters AUC of CRIB is inferior to that of CRIB-II or PREM.

Background and aims | Benchmarking of newborn mortality needs risk-adjustment of data for heterogeneous sub-populations. To assess utility of neonatal disease severity scores CRIB, CRIB-II and PREM and impact of influenceable items (FiO₂max, FiO₂min, body temperature (BT) base excess (BE)) to predict mortality in VLBW infants (VLBW), ELBW infants < 750g (BW750), g.a. 22–25 weeks (GA22–25).

Analysis of birth cohorts of years 2003–2007 from the Baden-Württemberg registry. Inclusion criteria: GA < 33 weeks and BW < 1500g. Variables considered: GA; BW; gender; BT; FiO₂max; FiO₂min; BE; malformation; death. Calculation of standard CRIB, CRIB-II and PREM with/without omission of selective items. Calculation of predictive value of scores/subscores for whole cohort VLBW, subgroups BW750 and GA22-25 using AUC of ROC curves. Wilcoxon/Mann-Whitney U-test, Fishers exact test, Pearson-Chi-Square test.

Results | Total of 5,340 cases, 862 cases < 750g, AUC for VLBW/ BW750: CRIB 0.89+/0.77, CRIB-II 0.86+/0.78, PREM 0.86+/0.77 (p<0.01). For GA22-25 AUC of CRIB/PREM was 0.80/0.70. Lower AUC of all 3 modified scores without BT and/or BE, for instance PREM=0.82 (VLBW) and 0.78 (BW750). AUC of CRIB without influenceable parameters dropped for VLBW from 0.89 to 0.81, for BW750 from 0.77 to 0.66 (compared to modified CRIB-II=0.71, modified PREM=0.73).

Conclusions | Standard CRIB is superior to standard CRIB-II, standard PREM, and all score modifications without influenceable items. No difference exists between the 3 scores when omitting influenceable parameters. For ELBW infants < 750g all standard scores are equally predictive, but without influenceable parameters AUC of CRIB is inferior to that of CRIB-II or PREM.