The role of EuroSCORE II in 21st-century cardiac surgery practice

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The EuroSCORE project was conducted in 1995 and reported in 1999 by Dr Nashef et al. [1]. It was revolutionary for its time because it provided the surgical community with knowledge on the risk profiles of European Adult Cardiac Surgery patients and allowed for the construction of a risk stratification model for the prediction of hospital mortality after adult cardiac surgery.

In the past decade, many European clinics and cardiothoracic surgery societies have adopted EuroSCORE as a tool to assess and to compare surgical performance. With the improved outcomes after cardiac surgery in more recent years, EuroSCORE became, however, less well calibrated. Although EuroSCORE’s discriminatory power remained adequate with an area under curve (AUC) of 0.75–0.80, its relative overestimation of hospital mortality and underperformance in high-risk patients initiated a discussion about the need for an improved tool to assess the surgical performance.

The EuroSCORE II project was published earlier this year [2]. Rightly, external validation studies were initiated, for example, the paper by Di Dedda et al. [3] in this issue of EJCTS. Di Dedda et al. show that EuroSCORE II performs adequately, both with regard to discrimination and calibration. However, should the new EuroSCORE II be adopted as the key tool to assess and compare performance?

In an era of continuous quality improvement, it is desirable to systematically measure the contemporary performance. It is essential to carefully define the target population of patients for whom we wish to apply a risk stratification model and the objective of that risk stratification model. Also, it is preferable to define mortality and morbidity in relation to the time of follow-up, because of the wide variation in discharge policies across Europe. If a new benchmarking tool is required for the European setting, then we should acknowledge that the modelling of the multiregional data poses various challenges. Regional differences, for example, high-income versus low-income countries, may have a serious impact on the calibration of a model [4]. For the purpose of national benchmarking (setting the national standard), but also for the purpose of local decision support (obtaining the centre-specific outcome estimates), a continuous process of recalibration may be required [5].

Ideally, 21st century risk stratification systems use large datasets representing current clinical practice, apply a systematic approach with the contemporary modelling techniques that employ advanced estimation and validation techniques such as penalization and bootstrapping [6]. These systems should be dynamic both with regard to the weight (and type) of co-variables and with regard to the calibration of outcomes. High-quality national or international databases should be available for this purpose.

It requires a professional organization to support such an initiative, as has been set up for the STS database (www.STS.org, maintained by the Society of Thoracic Surgeons). Thanks to this professional approach, and by the linking of the database to
health care provider mortality databases, for example, our insight into the predictors of the early and late outcomes after CABG has improved [7]. This does not only improve our knowledge but also provides the guidance for quality improvement and shared decision making. Given the growing societal demand to systematically register and monitor performance, the benefits associated with professional data registries such as the STS database most likely outweigh the costs.

In all, EuroSCORE II is a landmark scientific experiment that made the European Cardiothoracic Surgery community realize that there is an urgent need for a systematic approach to European cardiac surgery quality measurement. The European Association for Cardio-Thoracic Surgery has taken the initiative to start a quality improvement programme with a European database at the core of this programme. The database will accommodate national and international benchmarking as well as compare the outcomes with the STS database. It will be able to account for regional differences and periodical analysis of the database will enable frequent recalibration. This initiative is important as it represents a major step forward towards sustainable cardiac surgery quality improvement in 21st century Europe.

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REFERENCES