Critical care research in the resource-limited setting: Leveraging the power of the database

In this issue of the *SAJCC* Khan *et al.*[1] explored the association between pre-ICU hospital length of stay and ICU outcomes in a resource-limited setting.[1]

The methodology of the study is noteworthy as it included data on 2 040 intensive care patients that were extracted from an electronic ICU patient database. Notably, this database is from a regional hospital and not from an academic hospital with an established electronic health record. Furthermore, this database was designed and implemented by clinician researchers at the study institution. Research is challenging in resource-limited environments (including most state sector ICUs in South Africa (SA)) but this study indicates what is possible with clinician researchers that are prepared to champion a project. Beyond research, all ICUs should maintain a database, as it is only by systematic collection and analysis of objective clinical and administrative data that one can reliably assess and improve one's practice. For this purpose, the priority must be to establish the database using whatever resources are available. While designing a complex database with a high-tech front-end and automated outputs, or purchasing an expensive proprietary system may be feasible for some, even a simple spreadsheet-based database will yield valuable information. At an individual ICU level, any database is almost certainly better than waiting indefinitely for the 'perfect' database.

With the limited data available on critical care practices in sub-Saharan Africa, data on over 2 000 ICU admissions are a potential gold mine of information. Unfortunately, the data in this study are from a single institution and thus potentially have limited external validity. Unpublished data from individual ICUs that participated in the 30DOS study, illustrated that notable differences exist between ICUs within KZN, let alone SA as whole.[2] Surely it is now time for a multicentre critical care database in SA? This poses a number of challenges, including cost, complexity, compatibility, data safety and ethical concerns. These challenges are not insurmountable, however, and if one wishes to generate data that are likely to drive critical care forward in SA, they need to be overcome. As a first step is it not reasonable to establish a minimum dataset that all ICU databases should include? In this way even if there are delays in establishing a high-tech unified database, at least multicentre analyses will be possible on this minimum dataset. The Critical Care Society of Southern Africa is probably best placed to drive this process. Data from funders and hospital groups are an additional resource that should be available to researchers. Concerns regarding protection of patient data and implications of the Protection of Personal Information Act will also need to be addressed.

The results of the study by Khan *et al.*[1] are contrary to much of the published literature on the association between pre-ICU length of stay and patient outcomes. There are a number of potential reasons for this. One is a methodological consideration. The study combined at least two subsets of patients: those identified as critically ill but who experienced delays waiting for ICU admission and those with prolonged hospital admissions who deteriorated to the point of becoming critically ill and were then admitted to ICU. With the former, the temporal resolution of 'days' (used in this study) as opposed to hours (used in most other studies) may not have been sensitive enough to determine meaningful differences. For the latter, given the 'stringent' patient selection noted by the authors, it is likely that patients with prolonged hospital stays due to severe life-limiting acute or chronic conditions were not admitted to ICU, reducing the likelihood of finding a significant association between length of stay and outcome. It is also unclear whether, in patients admitted from theatre, pre-theatre admission times were evaluated. The young median age, preponderance of surgical patients, and high proportion of trauma patients also hint at demographic patterns that differ from data from most high-income sources.[3] Whatever the reason(s) for the findings in this study, it illustrates the importance of conducting locally relevant critical care research.

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