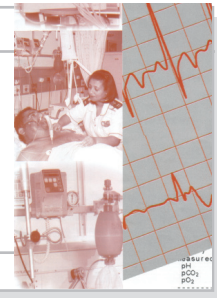


National audit of critical care resources: How long before we act?



The estimated annual expenditure on health care is vastly different in the USA (16% of GDP) compared with developing countries (approximately 3% of GDP).¹ South Africa is unique in sub-Saharan Africa, where expenditure on health is relatively high and is estimated to be between 8% and 10%.¹ Despite this, there are serious limitations to many aspects of health care delivery based on multiple factors in South Africa. It may be argued that it will take decades before we outlive the injustices imposed on our society by apartheid. In attempting to offer reasonable and responsible guidance to policy makers and politicians, clinicians and allied health care workers have an obligation to base decisions on objective evidence. To this end, the Critical Care Society of Southern Africa (CCSSA) embarked on a national audit of critical care resources in South Africa. The purpose of the audit was to objectively quantify existing services in the public and private sectors with a view to making recommendations for the future. The work culminated in five papers that were published in the *South African Medical Journal*.²⁻⁶ In addition, the data were presented to the national and several provincial departments of health, to an audience to which all participants in the study were invited, and to several national and international congresses. The data are compelling and offer a very effective framework on which future plans for critical care may be based. Notwithstanding this, the key recommendations have not been implemented apart from piecemeal implementation strategies by certain provinces. This review is intended to highlight the key observations and to emphasise the sentinel recommendations that the Society believes should be urgently implemented.

Study methodology²

The study protocol was approved by the National Department of Health, South African National Defence Force and all provincial departments. In addition, approval was obtained from all university ethics committees in SA. Lastly, all private hospital groups and CEOs of all hospitals also approved the study. Telephonic interviews were conducted with those hospitals that had no intensive care unit (ICU) or high care unit (HCU) facilities to determine where and how critically ill patients were transferred. Hospitals with ICU or HCU facilities were invited to fill in a questionnaire. The questionnaire was designed

following extensive consultation with the relevant role players. Strict quality control was applied to ensure validity of the data and ICH guidelines were applied at all times. A 100% audit was obtained. Data were provided by the CEO of the hospital or from nursing managers or medical directors of units where present.

Key observations

National distribution of facilities³

There were ICU/HCU facilities in 23% (92/396) of public hospitals compared with 84% (216/256) of private hospitals. There were a total of 4 168 beds, 57% of these being in the private sector. The vast majority of beds (86%) were in three provinces, namely Gauteng, KwaZulu-Natal and the Western Cape. This was true for both sectors. The person to ICU/HCU bed ratio was 1:20 000 in the Free State, Gauteng and Western Cape. In the other provinces it ranged from 1:30 000 to 1:80 000. The ICU to total bed proportion was 1.7% in the public sector and 8.9% in the private sector. Only 20% of all beds were utilised for paediatric and/or neonatal patients, 2.3% of all commissioned beds were not being used because of staff or equipment limitations. A small proportion of beds were designated as HCU beds (18%) and 5% of these were located in regular wards.

Transfer practices in hospitals with no ICU/HCU facilities⁴

Most public sector hospitals (77% (304/396)) do not have facilities, and as a result patients have to be transferred to other hospitals. Some hospitals which have facilities have to transfer patients because there are inadequate facilities to deal with the clinical problems that patients present with. A minority of hospitals use dedicated ICU transport vehicles. In the Northern Cape transport occurs exclusively via non-dedicated vehicles. More than 50% of hospitals transport patients more than 100 kilometres to receive appropriate care. In 10% of cases, transport distances exceed 300 kilometres. Transport does not occur to the nearest available facility because provincial boundaries have to be respected. In the private sector, most transfers occur in less than an hour. This only occurs in Gauteng for the public sector because distances are short. Delays in transportation have been shown to increase morbidity and mortality.⁵

Nursing care resources⁶

Using a conservative estimate of 3 nurses per bed, the national deficit of ICU nurses was estimated to be 7 920.⁷ There is convincing collateral evidence that this results in increased morbidity and mortality as well as increased cost of care.^{8,9} A large proportion of nurses (43%) have 0 - 5 years of ICU experience. Other data indicate that there are significant deficits in knowledge of nurses who work in ICU.¹⁰ The absolute deficit in nurses is compounded by losses of nurses to migration,¹¹ other clinical and non-clinical areas,¹¹ illness (including HIV)¹² and moonlighting within and without the employing institution. Lastly, there are data suggesting that our nurses are disillusioned by interpersonal relations at the workplace.¹³

Open versus closed units¹³

The ideal ICU is run by an intensivist (medical sub-specialist) who is responsible for taking the lead in developing and implementing guidelines and protocols and for developing a team approach to intensive care. A large body of evidence supports the view that morbidity and mortality as well as total cost of care are increased in open units and where a team approach does not exist.^{14,15} The majority of ICUs (71%) are open units. Only 4% of private units and 72% of public units are closed units. Only 4% of all units were ideal units (i.e. led by a qualified intensivist). The estimated additional cost of care based on lack of intensivist-driven care is R230 million per year. The deficit of intensivists is estimated to be 291, which at current rates of production will take approximately 31 years to produce (assuming no new units are developed).

Recommendations

It would be naïve to admit that the solution to the problems indicated above are simple. Equally, it would be an injustice to the patients we are meant to serve if we fail to act on such compelling objective evidence. A strategy to deal with these challenges must be reality based and contextually appropriate. For this reason, the proposal below has short-, medium- and long-term recommendations which consider fiscal pressure and competing health care imperatives.

Short-term

Regionalisation and integration. Given the gross disparity in access to critical care in the different regions of the country, it is intuitive that a regional approach that crosses provincial boundaries must be implemented as soon as is feasible. Integration will ensure that access to the right facility occurs at the first point of contact with the health care system. The plan must include regional critical care directors that will co-ordinate triage, resuscitation and transport based on available resources.

Protocols and guidelines. The success of the first strategy depends on efficient guidelines and protocols for practice. These must be developed by the health care team that drives care of the critically ill.

Continuous professional development and outreach. A programme that ensures ongoing education of health care professionals in the team is equally important and can be accomplished with an expansion of the existing framework of the CCSSA.

Retention strategies. Effective recruitment and retention strategies should be put in place to increase the pool of skilled personnel. These strategies should address Hertzberg's hygiene and motivating factors.¹³

Medium-term

The 'middle-order batsmen'. The greatest challenge is dealing with the gross deficiency in human resources. This is not unique to SA and has been well described even in resource-rich societies. Indeed, the loss of personnel to better-resourced countries is well described. A key initiative would be to produce a tiered critical care programme that will have two levels of care. The first will be driven by nurses and doctors that have intermediate skill and experience. There should be a clear scope of practice with incentive schemes that attract suitable personnel. The second tier would be driven by intensivists and fully trained ICU nurses, again with a clear scope of practice and training and incentive schemes.

Telemedicine. In tandem with the medium-term goal, it will be essential that the first-tier units have access to the level-two team as and when required. This will involve effective use of available technology, including telemedicine.

Maximising use of existing beds. Beds currently not in use because of staffing or equipment deficiencies should be re-commissioned.

Long-term

Changing open units to closed units. Suitable training programmes must be established at academic centres to promote the development of intensivists and critical care trained nurses. In doing so the pool of trained personnel will increase and it will smooth the implementation of the 'closed unit' model of care delivery.

New units. All new units that develop in the future must be established as closed units.

National database. Ongoing re-evaluation of any strategy is entirely dependent on accurate information. To this end the proposed CCSSA database must be seen as a long-term Department of Health objective.

Summary

The findings of the national audit have made clear the need for two key initiatives: first to ensure efficient use of ICU resources and second to develop the necessary human capacity. To deny the need for these initiatives is untenable and will perpetuate the injustices of the past. The time to act is now.

Sats Bhagwanjee, Juan Scribante and the Council of the Critical Care Society of Southern Africa

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