

# Supporting critical care medicine in low-resource settings

Jean-Louis Vincent, M.D., Ph.D, Matheus Oliveira Ferreira, M.D.

Department of Intensive Care, Erasme Hospital, University libre de Bruxelles, Brussels, Belgium



This work is licensed under a Creative Commons Attribution 4.0 Unported License.

## Corresponding author:

Jean-Louis Vincent, M.D., Ph.D.  
Department of Intensive Care  
Erasme Hospital  
1070 Brussels  
Belgium  
Phone: + 32 2 555 3380  
E-mail: [jlvincent@intensive.org](mailto:jlvincent@intensive.org)

## ACCESS THIS ARTICLE ONLINE



[View PDF](#)

## HOW TO CITE THIS ARTICLE IN VANCOUVER STYLE?

Vincent JL, Ferreira MO. Supporting critical care medicine in low-resource settings. *Journal of Nepalese Society of Critical Care Medicine*. 2024 Jan;2(1):1-3.

Submitted : 25 November 2023  
Accepted : 30 November 2023  
Published Online : 22 January 2024  
Conflict of Interest : None  
Source of Support : None

Critical care medicine in a high-income, high resource setting bears little comparison to critical care medicine in low- and middle-income countries with limited resources.<sup>1</sup> Intensive care units (ICU) are generally smaller with less technology and equipment and fewer staff per patient, in places with limited resources. In some hospitals, ICU beds are still not grouped into formal ICUs, but just found on the general ward, closer to the nurses station to facilitate observation and monitoring. Yet, the need for critical care is as high, if not higher, in low-resource settings. In 2019, the 72<sup>nd</sup> World Health Assembly of the World Health Organization stated the need to “ensure the timely and effective delivery of life-saving health care services to those in need”.<sup>2</sup> How best this should be achieved remains a topic of debate.

Allocating more funding for intensive care to countries with limited resources may help, but is hard to achieve, partly because those responsible for resource allocation often stress that the priority for healthcare must be to first provide good basic care, rather than sophisticated technologies. Indeed, it is difficult to argue against this as, clearly, primary healthcare, e.g., vaccination, basic first aid, diagnosis and management of chronic conditions like diabetes or hypertension, will help prevent development of conditions that may need intensive care. Nevertheless, quality and effective intensive care should be available for all the world’s citizens, wherever they live.<sup>1</sup>

There are two major approaches that can be considered: one, perhaps the most simple, is to recognize the lack of funding and restrict any assistance to low-cost options that can be easily applied; the other strategy is to develop optimal management approaches, which are applicable and achievable worldwide based on available evidence and resources, and to invite regional authorities to do their best to achieve these targets. Importantly, as systems vary and available resources are not the same in all low-resource settings, both these approaches would need to be adapted to the local situation.

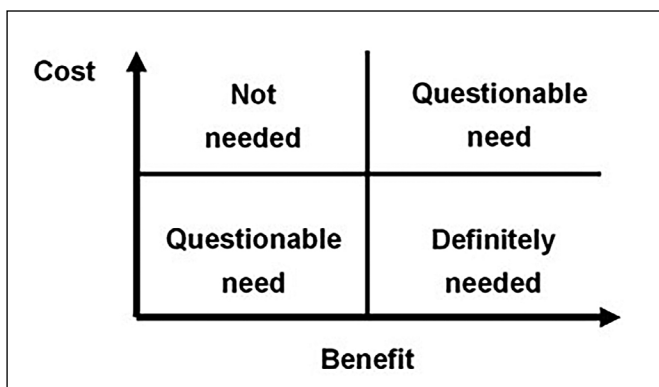
We strongly advocate the second of these approaches. The first strategy will not stimulate or encourage progress but rather favor stagnation; whereas the second option will stimulate growth in providing quality critical care, with the hope that authorities will be willing to adhere to the recommended optimal management for humanitarian and perhaps even legal reasons.

This debate emerged during the development of the latest Surviving Sepsis Campaign guidelines,<sup>3</sup> which for the first time included some representatives from low- and middle-income countries (LMICs) to offer their opinion and advice. Within these guidelines,<sup>3</sup> we find two statements in particular that are highly controversial:

1. “With no apparent benefit, unknown costs, and limited availability in some settings including LMICs, the panel issued a weak recommendation against using procalcitonin...”
2. “Prolonged infusion (of beta-lactams) is a feasible intervention if suitable IV access is present, and resources are available...The latter may be an issue in some resource limited settings, including LMICs.”

Yet, there is good evidence supporting both the use of procalcitonin to guide antibiotic administration and the prolonged infusion of beta-lactams in the presence of problematic organisms - why would these approaches not be acceptable in LMICs? In the second case, there is not even a cost issue as the total amount needed of the drug could even be reduced. Statements such as these act to keep ICUs in low-resource settings as just that – the poor relatives of ICUs in high-resource settings that are “allowed” to use these approaches. How can statements such as these promote progress? How do they encourage ICUs in LMICs to advance, to strive toward providing good quality, standard of care? Of course, hospitals in low-resource settings cannot provide the same facilities as ICUs in high-income, high-resource settings, but they can provide quality patient care with careful use of the resources they have.

To achieve this, we suggest that three situations can be considered, based on cost/benefit analyses (Figure 1).



**Figure 1.** The need for an intervention based on the balance between benefits and cost.

1. a test or intervention that is considered essential, and is definitely affordable. A good example is the measurement of blood lactate concentrations: lactate concentrations can not only help identify critically ill patients who need special attention (for shock in particular) but can also be used to evaluate the response to therapy when measured serially<sup>4</sup> (we prefer not to use the term to ‘guide therapy’,

as this can suggest that no other measurements are needed). Moreover, the test is not costly, so its use should be encouraged and it should be available for all.

2. a test that is considered useful, but not essential, because there are reasonable alternatives. A good example of this is procalcitonin (PCT) measurements, which can be useful to help decide whether antibiotic therapy should be started or, more likely, when it should be discontinued. Isolated measurements of PCT may not be very costly, but for repeated, routine use, costs are not so cheap. Measurements of C-reactive protein (CRP) are very cheap and may provide an (almost) equivalent value.<sup>5</sup> In this situation, one should not advise against measuring PCT, but consider that the issue is open to debate and the test could be recommended if the costs of the test decrease.
3. a test that is costly, but useful and relatively easy to apply, and able to reduce the need for other, more sophisticated and thus expensive investigations. Echography is a good example of this. Ultrasound instruments are costly and use requires some training, but they are portable, have multiple potentially beneficial uses, and use can reduce the need for other imaging techniques. For example, echography of the lungs can prevent the need for chest X rays or even computed tomography (CT)-scans; ultrasonography in a trauma patient can avoid the need for a CT scan to identify bleeding, etc.

Rather than merely stating that a test is too expensive or not available, a cost/benefit ratio should be elaborated for each test or piece of equipment and a considered and informed decision made, taking into account the specifics of each country in terms of logistics, needs and available resources. Critical care physicians in low-resource settings should be encouraged to advance and develop their specialty to provide the best possible care for their patients. Colleagues in higher resource settings must support, not restrict, this progress.

**REFERENCES**

1. Marshall JC, Bosco L, Adhikari NK, et al. What is an intensive care unit? A report of the task force of the World Federation of Societies of Intensive and Critical Care Medicine. *J Crit Care.* 2017;37:270-6. [[Pubmed](#) | [Google Scholar](#) | [DOI](#)]
2. World Health Organization. Emergency care systems for universal health coverage: ensuring timely care for the acutely ill and injured. 2019. Available at: <https://www.who.int/publications/i/item/emergency-care-systems-for-universal-health-coverage-ensuring-timely-care-for-the-acutely-ill-and-injured> (accessed 24-11-23).
3. Evans L, Rhodes A, Alhazzani W, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021. *Intensive Care Med.* 2021;47:1181-247. [[Pubmed](#) | [Google Scholar](#) | [DOI](#)]

4. Vincent JL, Quintairos e Silva A, Couto Jr L, Taccone FS. The value of blood lactate kinetics in critically ill patients: a systematic review. *Crit Care*. 2016;20:257. [[PubMed](#) | [Google Scholar](#) | [DOI](#)]
5. Oliveira CF, Botoni FA, Oliveira CR, et al. Procalcitonin versus C-reactive protein for guiding antibiotic therapy in sepsis: a randomized trial. *Crit Care Med*. 2013;41:2336-43. [[PubMed](#) | [Google Scholar](#) | [DOI](#)]