

# Sepsis is the leading cause of death in Brazilian ICUs, with 55.7 percent mortality rate

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Brazil has an extremely high rate of mortality from sepsis in intensive care units (ICUs), surpassing even mortality due to stroke and heart attack in ICUs. According to a survey conducted by researchers at the Federal University of São Paulo (UNIFESP) and the Latin American Sepsis Institute (LASI), more than 230,000 adults die from sepsis in ICUs every year. Even more alarmingly, 55.7 percent of sepsis cases in ICUs end in death.

These numbers are from the first nationwide study of patients with sepsis admitted to ICUs, published in *The Lancet Infectious Diseases*.

Sepsis is triggered by a dysregulated immune response to an infectious agent. The immune system begins to combat not the infectious agent but also healthy tissues, leading to organ dysfunction. Both community-acquired infections and healthcare-acquired infections can progress to sepsis, accounting for 40 percent and 60 percent of cases, respectively.

According to Flávia Machado, a professor at UNIFESP's Department of Anesthesiology, Pain & Intensive Medicine, several factors explain the alarmingly poor quality of treatment for sepsis in Brazilian ICUs. "Our patients aren't well cared for. Late diagnosis is common, since people delay going to a doctor or hospital, sepsis is detected too late, and treatment is inadequate. As a result, mortality is very high. There are also major procedural problems," she said.

When sepsis is detected early, Machado states, it is relatively easy to treat, basically requiring the administration of antibiotics and fluids, monitoring of the patient in the ICU, and analysis of bacterial culture.

"Vaccination can prevent community-acquired sepsis. Hospital infection-control strategies can prevent part of hospital-acquired sepsis. The measures needed are simple, and their absence shows the healthcare system in question isn't good," Machado added.

## **A global problem**

The incidence of sepsis is a global problem. In May 2017, the World Health Organization (WHO), an arm of the United Nations, passed a resolution on sepsis. "Today, the U.N. recognizes sepsis as a world health problem," Machado said. "Here in Brazil, we will soon have a [national action plan](#) for sepsis, similar to the national action plan for hospital infection, for example. I believe things will start to change. WHO's member states, including Brazil, will have to take steps to make sure they do."

## **Low bed availability**

The research coordinator emphasized: "Access to the ICU is a key factor in mortality." Machado explained that studies based only on patients treated in ICUs result in mortality rates that vary widely between countries depending on the number of beds available in proportion to the country's total population.

"When bed availability is high, the number of less severe patients admitted to ICUs tends to be high as well, so that mortality is lower. In countries like Brazil, where bed availability is low, especially in the public system, only the most severe patients tend to be admitted to ICUs,

and mortality rises," she said.

To avoid exclusion of patients from intensive treatment, the researchers advocate the use of intermediate-care units, arguing that the absence of such units in most Brazilian hospitals may contribute to longer ICU stays and consequently to a higher prevalence of sepsis.

## Hospital infection

Another factor that contributes to the prevalence of sepsis is the high frequency of [hospital infection](#) due to lack of proper prevention. According to the study, most patients with sepsis had hospital-acquired infections.

According to the study, the low quality of care in regular wards impairs discharge policy as well as hindering basic support for and monitoring of patients with disease of mild to moderate severity. Another possible cause of the high prevalence of sepsis is differences in end-of-life care, including a virtual absence of palliative care.

"End-of-life decisions are infrequent in Brazil, and gaps in communication, scarcity of legal regulation, absence of advanced directives, and cultural and religious beliefs might result in unnecessary efforts to sustain life," the researchers write in the article.

The researchers developed a score to assess resource availability based on eight items required for sepsis treatment. Institutions rated inadequate on six of these eight items correlated with a heightened risk of death from sepsis. The items were lactate sampling, central venous oxygen saturation (blood work), bacterial detection culture, antibiotics, fluids, catheter, central venous pressure monitoring, and vasopressor (noradrenaline) use.

"Note that these are simple items," Machado said. "It's sufficient to administer antibiotics, collect cultures, do a few straightforward tests, give fluids. You don't need sophisticated resources. So our results say a lot about the conditions prevailing in Brazil."

## Methodology

To arrive at these results, the researchers divided Brazil's ICUs into 40 strata according to geographic region, city size, and whether the institution was public or private, among other factors. Ultimately the sample comprised 227 institutions and included 15 percent of Brazil's ICUs.

"We designed a random sample of ICUs nationwide," Machado said. "This was valid because all previous research on sepsis in Brazil—and I'm not aware of any other Brazilian studies with a sample of this kind—entailed asking institutions whether they wanted to take part. The sample was therefore biased, probably comprising only the best institutions, and mortality rates were in the range of 40 percent rather than the 55.7 percent we found."

According to the survey findings, while the quality of care varies greatly from one institution to another, the difference between mortality in the public system (56 percent) and in the private system (55 percent) was not statistically significant. Adult cases of ICU-treated sepsis are estimated to total 420,000 per year, with 230,000 ending in death.

## Recommendations

The findings of the study can help those charged with preparing the national action plan for [sepsis](#), according to Machado. "These data will be an important input for the plan," she said. "We want to do more

surveys constructed similarly to this one but covering more segments such as emergency units and pediatric and neonatal ICUs, as well as investigating hospital-acquired infections."

**More information:** Flavia R Machado et al, The epidemiology of sepsis in Brazilian intensive care units (the Sepsis PREvalence Assessment Database, SPREAD): an observational study, *The Lancet Infectious Diseases* (2017). DOI: [10.1016/S1473-3099\(17\)30322-5](https://doi.org/10.1016/S1473-3099(17)30322-5)

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