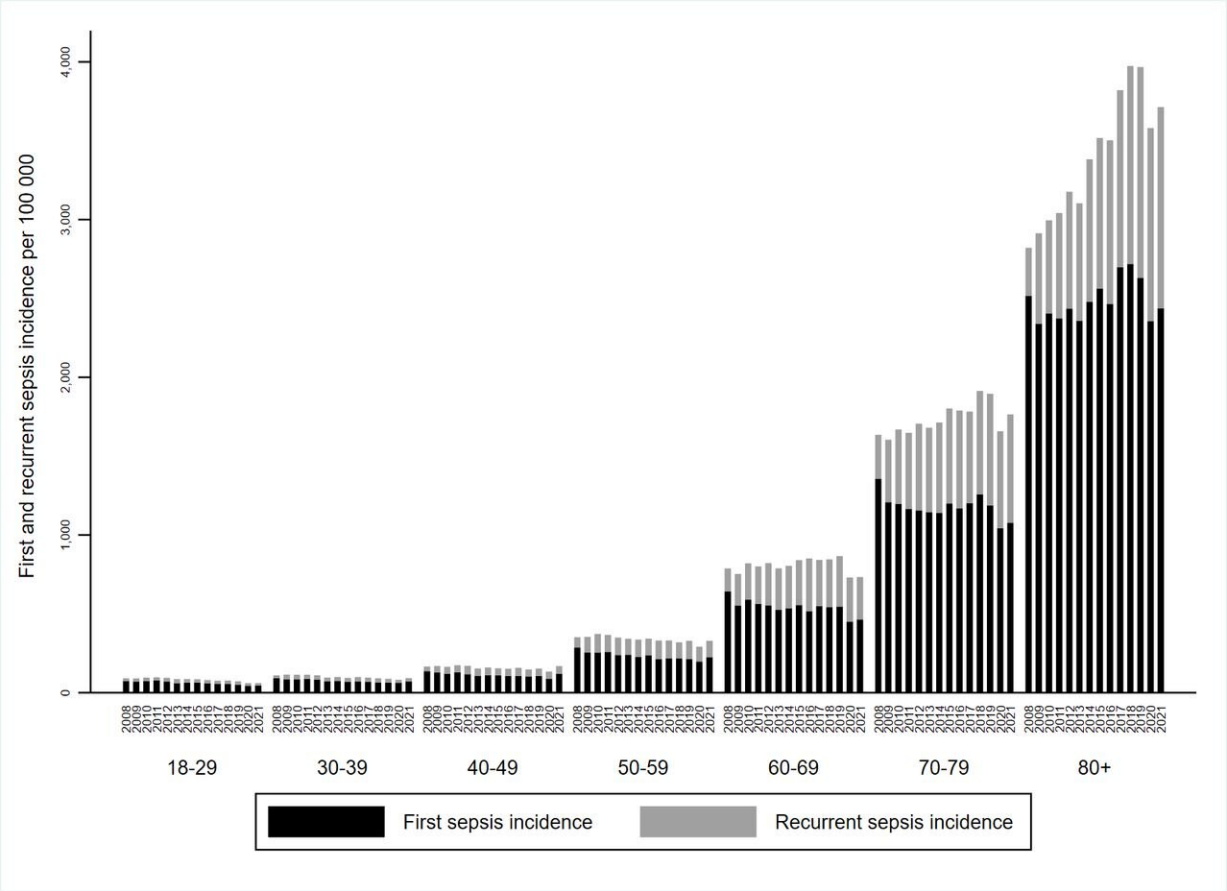
Medical Xpress

More people develop sepsis than previously thought, but more survive

September 12 2023, by Steinar Brandslet



Annual first and recurrent sepsis incidence rates by 10-year age groups. Credit: *BMJ Open* (2023). DOI: 10.1136/bmjopen-2023-071846

Sepsis, also colloquially referred to as blood poisoning, is a serious

condition. Just over 3,000 people die with a diagnosis of sepsis in Norwegian hospitals each year.

However, sepsis is not actually poisoning at all. The condition occurs when the immune system overreacts to an infection that can be caused by bacteria, viruses, fungi or parasites. The immune system attacks the organs of the body and the patient develops organ failure.

A new study of 300,000 sepsis admissions has found that the condition is more prevalent than previously thought. However, many more patients survive, and the increase in cases is largely due to more people developing sepsis repeatedly, rather than dying the first time they contract it.

"Each year, 250 of 100,000 people in Norway develop sepsis for the first time," says Lise Tuset Gustad, a researcher at NTNU, Nord University and Levanger Hospital.

"We see this in the average age-adjusted rates. The rates remained stable throughout the study period but are higher than has been shown by previous studies," she says.

The research group at NTNU's Central Norwegian Center for Sepsis Research has looked at figures for the entire period from 2008 up to and including 2021. An article about the work has now been published in *BMJ Open*.

Very strong material helps debunk myths

The researchers conducted a national registry study, which means the quality of the data is very strong. As far as the researchers are aware, this is the first time a nationwide sepsis study has been carried out over such a long period, and that includes all patients admitted to hospital rather

than only those requiring intensive care.

They found 317,705 hospital admissions due to sepsis during the period from 2008 up to and including 2021. No fewer than 222,832 of the patients were admitted to hospital with sepsis for the first time.

Tuset Gustad was the main academic supervisor for Nina Vibeche Skei during her work on her doctoral degree. Skei is a consultant anesthetist at Levanger Hospital.

"This study helps debunk the myth that an increase in the number of sepsis cases is due to greater awareness of the condition and therefore increased reporting. The proportion of people who developed sepsis for the first time per 100,000 inhabitants remained stable from 2008 up to and including 2021," Skei, who is the first author of the paper, said.

Sharp decline in mortality

The study also found that many more people survive than before.

"During this period, mortality rates in hospitals have dropped by no less than 43% for those admitted with sepsis for the first time," Skei said.

"In total, mortality rates in hospitals have decreased by 1/3, regardless of whether it was the first time the patient had had sepsis, or if they had had it before. The cause of the decline in mortality could be increased awareness of the condition and updated guidelines for treatment," Skei says.

Sepsis mortality increases during pandemic

During the first two years of COVID-19, the number of hospital

admissions with first-time sepsis decreased. The researchers believe that this may have been due to social distancing, which resulted in fewer infections in the population overall.

"We also found that fewer people over the age of 70 were admitted to hospital with sepsis. This may have been due to the great amount of pressure on hospitals and the need to prioritize certain patient groups. These priorities resulted in many people over the age of 70 not being admitted to hospital compared to an ordinary year," Tuset Gustad says.

"Sepsis mortality rates at hospitals increased during the pandemic," Skei says, especially in 2021.

COVID-19 raises awareness of sepsis

COVID-19 made more people aware that infections could lead to organ failure. Many people were frightened by images of patients on respirators in intensive care units, first in Wuhan, later in Italy and eventually also in Norway. Infections, bacterial and viral, can lead to organ failure in some patients.

This is because the immune system can develop an exaggerated response to infections in certain patients. The patients may then develop sepsis, which is an infection with organ failure.

"COVID-19 put sepsis on the map. There was little awareness of sepsis caused by viral infections before the pandemic. The SARS-CoV-2 virus resulted in increased awareness of sepsis caused by the virus in particular, and sepsis in general," Skei says.

Higher mortality rates with COVID-19 as the cause

"During 2020 and 2021, 30,000 people were admitted with sepsis, of which 2,845 were admitted with COVID-19 sepsis. That is around 10%," Skei says.

Nearly 90% of those with first-time sepsis developed sepsis for reasons other than COVID-19, including during the pandemic.

"However, a greater proportion of those developing first-time sepsis due to COVID-19 died," Skei said.

More people with recurring sepsis

The figures also show that more people than previously are developing repeated bouts of sepsis.

"Hospital admissions with recurring sepsis have increased during the period. The increase is primarily due to a doubling in recurring sepsis episodes among patients over the age of 60," Skei says.

In people over 80, recurring sepsis more than quintupled in 2021 compared to 2008.

"The cause is likely that we have become better at treating other medical conditions such as cancer and that we live longer. Patients with a weakened immune system and the elderly are more susceptible to both first-time and recurring sepsis," Skei said.

Follow-up required

The results therefore contradict what many professionals previously believed. They believed that the increase in sepsis cases was due to changed regulations for the coding of sepsis diagnoses. But that is not the

case.

"We used the same codes for sepsis during the entire study period, so we know that these are real changes," Tuset Gustad said.

The results are likely unique both on a global level and in Norway. Previous Norwegian studies are old, the most recent used data from 2011 and 2012 and shows survival trends for sepsis for a period of two years only. This study, on the other hand, looks at sepsis trends over a 14-year period.

"Being able to distinguish between first-time and recurring sepsis is unique on a global level and this is thanks to the excellent medical registries in Norway," Tuset Gustad said.

"Our results should have implications for clinicians and politicians—and for health policy planners. The burden of sepsis is greater than research communities previously thought. However, we do particularly need to focus our attention on the major increase in patients who develop recurring sepsis and identify preventive measures for this patient group," Skei said.

"Health policy planners need to take these results into account. We need to make the effort to prevent recurring sepsis," Tuset Gustad said.

More information: Nina Vibeche Skei et al, Long-term temporal trends in incidence rate and case fatality of sepsis and COVID-19-related sepsis in Norwegian hospitals, 2008–2021: a nationwide registry study, *BMJ Open* (2023). DOI: 10.1136/bmjopen-2023-071846