

Inspection findings

Reported in the table below are the main findings from the inspections at the three hospitals, a description of key measures implemented by the hospitals after the inspections, and the percentages before and after the inspection of patients with sepsis who had antibiotic administration within one hour. Time to antibiotics was an important performance measurement included in the inspections' review of electronic health records (EHR). A previous study from this project lists all indicators that were included in the EHR review.[1]

The data for the main findings are based on the focus group interviews and the publicly available inspection reports.

The data on the percentages of patients with antibiotic administration within one hour were collected by the inspection teams. Patients presenting to the emergency department with an International Classification of Diseases, 10th Revision (ICD-10) diagnostic code classifying sepsis or infection were identified through the Norwegian Patient Registry. The EHR and included patients with clinically suspected infection and two systemic inflammatory response syndrome signs (not including high leukocyte count) were included.[2] Patients were sampled from four time periods specific to each hospital: two before the inspection and two after. Records from the two pre-inspection time periods were reviewed during the inspection, and records from the post-inspection periods were reviewed at 8 and 14 months after the inspection, using records from the most recent patients. For each time period, 33 patients were sampled, though the number of patients included in the analyses in some cases ended up being slightly smaller due to duplicate records.

References

1. Husabø G, Nilsen RM, Flaatten H, et al. Early diagnosis of sepsis in emergency departments, time to treatment, and association with mortality: An observational study. *PLoS One* 2020;15(1):e0227652 doi: 10.1371/journal.pone.0227652.
2. Dellinger RP, Levy MM, Rhodes A, et al. Surviving Sepsis Campaign: international guidelines for management of severe sepsis and septic shock, 2012. *Intensive Care Med* 2013;39(2):165-228 doi: 10.1007/s00134-012-2769-8.

Supplementary table 1 Main findings from the inspections

Hospital	Population*	Main findings from the inspection	Follow-up by hospital	Percent of patients with antibiotic administration within one hour		
				Before insp.	After insp.	n
Hospital A	350 000	The inspection found that for a substantial proportion of patients, time from presentation to examination by physician and administration of antibiotics was delayed.	In response to the inspection, the hospital evaluated their procedures in inter-professional meetings and implemented changes in procedure and training initiatives.	22%	49%†	123
Hospital B	100 000	Some of the main findings from the inspection were delays in examination by physician and antibiotic administration. There were also inadequacies in documentation of responsibility and medical procedures. The emergency department in Hospital B had already started an improvement project for sepsis care prior to the inspection. The inspection nevertheless found deficiencies that the hospital had not been aware of.	The inspection led to a deepened commitment by the top-level management for the ongoing improvement project.	35%	59%†	122
Hospital C	50 000	The inspection found that for many patients, antibiotic treatment started too late. Furthermore, there were at times not enough available physicians to attend to patients in emergency department and not clear designation of responsibility for treatment between interns and resident physicians.	Following the inspection, the hospital started measuring indicators related to treatment in the emergency department, and clinicians and managers used these measurements for quality improvement purposes. In addition, there was a change in prehospital practice where more patients were administered antibiotics before being sent to the hospital.	18%	41%‡	77
Hospital D	300 000	The inspection found delays in antibiotic treatment and inadequate triage and observation of patients in emergency department.	After the inspection the hospital has implemented several initiatives, including training, revised procedures, and stand-up improvement board meetings.	15%	43%†	121
All hospitals [§]				25%	43%†	2869

* The hospitals are publicly owned and run institutions with responsibilities for specialized acute somatic care for all inhabitants in their local area. "Population" figures reported here are (rounded off and) based on information from the governments National plan for hospitals Meld. St. 11 (2015–2016).

† P-value < 0.01 (chi square test for difference between before and after inspection)

‡ P-value < 0.05 (chi square test for difference between before and after inspection)

§ All hospitals = all 24 hospitals included in the nation-wide inspection, including hospitals A - D.