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**Abstract**

**Lessons learned from infection surveillance: Risk factors and outcome of health care associated infections in hospitals and long term care facilities.**

**Background:** Hospital associated infections (HAIs) affect about 4.5.million patients in health care facilities in Europa every year. In Norway, as in the rest of the industrialized countries, more than one of twenty patients will have HAIs during their hospital stay and the infection rate in long term care facilities (LTCF) is reported to be comparable to that found in hospitals. Surveillance of HAIs is considered essential for identifying the magnitude of HAIs and the distribution of HAIs over time. Surveillance is also important for evaluating the effect of preventive measures.

The overall objective of this thesis was to study occurrence, risk factors and outcome of health care associated infections in hospitals and long term care facilities in Norway, applying refined infection surveillance methods. The studies were conducted in six LTCF in Oslo and Bergen and at Haukeland University Hospital, Bergen.

**Methods:** In the study from LTCF the incidence of health care-associated infections was recorded prospectively for six months in an open cohort of 791 residents. In a nested case control study (residents with HAIs as cases, residents without HAIs as controls) we identified potential risk factors for infections. In order to measure the incidence of complications for HAIs in form of reduction in overall physical condition, transfer to hospital and death we followed the cases and controls as a cohort in 30 days.

The studies from Haukeland University Hospital were based on prevalence surveillance data from the period 1994 to 2012. The aim of these studies was to examine prevalence, trends, risk factors and consequences of HAIs in form of patient mortality and length of stay.

**Results:** The incidence of infections in the LTCF homes was 5.2 per 1000 resident-days and in hospitals the prevalence of HAIs was 7.6%. In both LTCF and hospitals the most frequent recorded HAIs were urinary tract infections. The most severe consequences were found, both in LTCF and hospitals, among patients with blood stream infections and lower respiratory tract infections.

**Conclusion:** HAIs is a major problem both in LTCF and hospitals and cause severe consequences for the patients. Surveillance can be used to monitor HAIs and implement preventive measures.