

# ICU-acquired complications

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Acquired complications in the intensive care unit (onset > 48 hours after admission) are common, for example acute respiratory distress syndrome (ARDS), infections, and acute kidney injury (AKI). While its presence is associated with higher mortality, the adage “correlation does not imply causation” suggests many patients may die with, rather than from, such complications. Appropriate quantification of the impact and burden of these complications are imperative to understanding its severity and the importance of additional preventive measures and timely treatment. This study aimed to estimate the attributable effect of an ICU-acquired complication on mortality, with acute kidney injury as an example. We studied consecutive adult patients with a length of stay of at least 48h in which AKI was not present in two tertiary intensive care units in the Netherlands from 2011 to 2022. We adjusted for the evolution of disease severity and possible nephrotoxic medications until onset of ICU-acquired AKI using marginal structural modeling via inverse probability weighting, and calculated the time-dependent population-attributable fraction of ICU mortality. In all ICU-acquired AKI cases and a random selection of controls (who are at least 48h in the ICU), we also measured sequential plasma proteins across 6 different pathophysiological domains to gain insight in the predisposition to an ICU-acquired event.