

# Impact of an outcome-driven quality management system on in-hospital mortality for acute myocardial infarction

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## Objective

An ongoing reduction of in-hospital mortality for acute myocardial infarction (AMI) over the last decade has been shown in several industrialized countries, as well as in Germany.

**We studied how the observed reduction of AMI mortality in the Helios hospital group compares to the overall reduction in all German acute care hospitals.**

The Helios hospital group is a for-profit provider of hospital services and runs about 60 hospitals in Germany. Since 2000 the group developed an outcome-driven quality management system based on indicators derived from administrative data. Lower AMI mortality compared to the German average was set as goal in 2002. In parallel, peer review (audit) procedures in order to analyze treatment processes were performed in departments with subpar results.

## Methods

We used hospital discharge data from 2002 to 2008 of 15 acute care hospitals of the Helios group with available data over this time span. For Germany we used data from the acute care hospital statistics provided by the German Federal Statistical Office, covering all discharges in German acute care hospitals.

We compared AMI in-hospital mortality in the 15 Helios hospitals (AMI cases: 2,498 in 2002 and 2,472 in 2008) with AMI in-hospital mortality in all German acute care hospitals (AMI cases: 170,756 in 2002 and 211,491 in 2008).

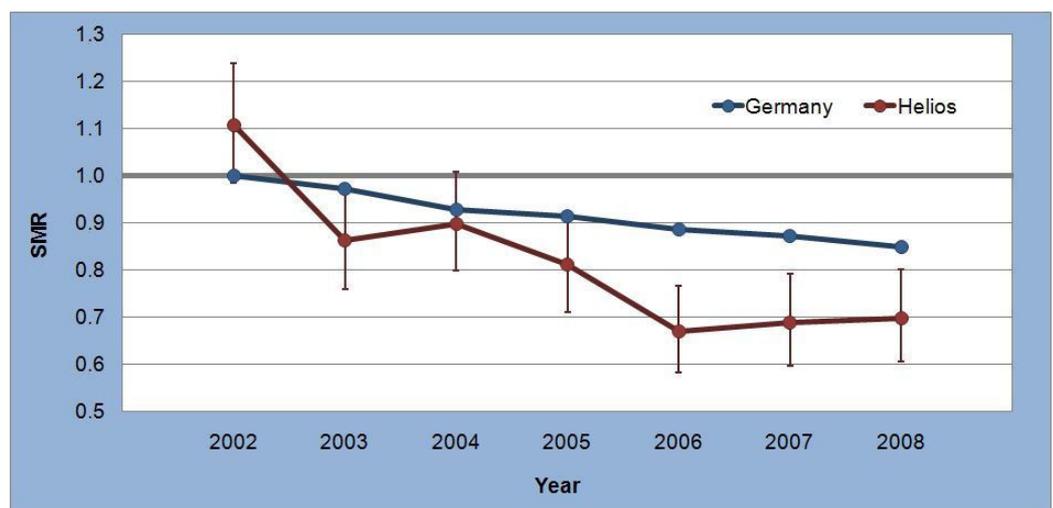
Patients with principal diagnosis of ICD-10 Codes I21 and I22 and age > 19 were defined as AMI. For Helios and for all German hospitals we calculated age- and sex-standardized mortality ratios (SMR) using the AMI mortality of all federal discharges in 2002 as reference.

## Results

Compared to 2002 there is a reduction of AMI in-hospital mortality for Germany by 15%.

The Helios hospitals had a slightly higher mortality than the German average in 2002 (SMR 1.11), which was one of the reasons for the introduction of the quality improvement program.

From 2002 to 2008, the SMR for Helios AMI mortality declined by 37%. It reached a plateau at a SMR of around 0.70, i.e. 30% below the German mortality of 2002.



## Conclusion

The decrease of AMI in-hospital mortality in Germany is in line with corresponding international observations. The Helios hospitals operate under the same conditions as other German hospitals. Starting from a level which was slightly above the average German mortality, impressive improvements could be achieved within four years (2002 to 2006). After that, the mortality seems to have reached a plateau. The improvement at Helios was much faster than that for Germany. These numbers indicate a positive impact of the Helios quality management system on AMI outcomes.

This positive impact may also be concluded on a more informal basis from the results of the peer review process. The review of medical records of AMI fatalities in departments performing subpar (i.e. SMR > 1) by cardiologists from other Helios hospitals showed numerous problems regarding treatment guideline adherence, interdisciplinary team work, ER management, etc.

Improvement activities have been implemented based on these findings, supervised by the Helios medical expert board. Success of improvement activities was continuously monitored using the outcome indicators. These results indicate, that a quality management system driven by outcome indicators combined with internal review/audit procedures, which address process deficiencies, may considerably improve medical outcome for important diseases. AMI mortality is one example for the set of quality indicators used by Helios (G-IQI, German Inpatient Quality Indicators), which cover about 30% of all acute care hospital cases.

Improvements have also been achieved for many treatments besides AMI, such as stroke, heart failure, pneumonia, hip fracture, total hip replacement, or visceral surgery.

## References

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