Study examines cancer-care outcomes among US hospitals

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Decades of research have shown that cancer survival outcomes can vary widely depending on where patients receive care. But efforts to rank hospitals by long-term survival rates have been hindered by the readily available administrative data derived from Medicare claims, which lacks information about cancer stage. Two hospitals providing equally good care may have different survival rates if one hospital treats sicker patients, for example.

Now, a study published today in *JAMA Oncology* from Memorial Sloan Kettering Cancer Center (MSK) finds that risk-adjusted Medicare claims data—without information about the cancer stage of individual patients—may be sufficient to calculate the long-term survival rates at hospitals providing cancer care in the United States.

The transparent method that the researchers propose reveals substantial differences in survival rates among four major categories of hospitals. The researchers believe these differences are worthy of deeper exploration.

"Patients need reliable information about hospitals' survival rates so they can make informed choices about their care," said David G. Pfister, MD, Chief of MSK's Head and Neck Oncology Service and lead author of the study. "But similarly important, measuring the differences in survival rates among hospitals is a first step toward improving cancer care at every hospital across the country."

The Findings

The analysis looked at four different types of hospitals:

- PPS-exempt: 11 freestanding cancer hospitals that are exempt from the Medicare prospective payment system
- NCI cancer centers: 32 NCI-designated cancer centers that are not PPS-exempt
- AMC: 252 other academic teaching hospitals
- Other: 4,873 remaining hospitals, including community hospitals

Findings showed that patients treated at PPS-exempt hospitals have a 10 percent lower chance of dying in the first year than patients treated at other non-teaching hospitals (18 percent versus 28 percent), with NCI cancer centers and AMCs falling between the two extremes.

Including the cancer-stage information of individual patients, available through the Surveillance, Epidemiology, and End Results (SEER) Medicare database, in the analysis did not significantly impact the performance rankings of the hospital types. Rankings remained consistent with what was calculated from the risk-adjusted Medicare claims data without cancer-stage information.

Successive years followed a similar pattern, with the survival gap persisting over five years. The risk-adjusted five-year survival rates for the hospital types were 53 percent at PPS-exempt hospitals; 49 percent at NCI cancer centers; 46 percent at AMCs; and 44 percent at other hospitals.

"This observed one-year survival gap of 10 percent between hospital types is substantial and represents potentially preventable deaths of cancer patients," said Peter B. Bach, MD, MAPP, Director of MSK's Center for Health Policy and Outcomes and senior author of the paper.

"If further research confirms this survival gap, a next step would be to figure out the mechanics underpinning it. Is it due to readmissions or mortality rates after surgery? Are people having severe side effects keeping them from finishing the chemotherapy that benefits them? We need to break down the data and figure out where the gaps in care are, and none of it is simple."

The Study Methodology

For the study, MSK researchers analyzed two parallel data sets:

- Fee-for-service Medicare claims from across the United States, which cover the entire spectrum of inpatient and outpatient cancer care—including office visits, chemotherapy, radiation, and home care—but do not include information on cancer stage
- The SEER Medicare database, which does include information on cancer stage

The two data sets collectively included nearly 750,000 patients who had cancers of the lung, prostate, breast, or colon, among others. Patients began either cancer treatment or management of recurrent disease in 2006. The study ended five years later, in 2011.

Researchers used 3M's Clinical Risk Group (CRG) software to risk adjust the data from both the Medicare and SEER data sets. The CRG algorithm assigns each patient to a group that reflects his or her overall health status and the presence and severity of comorbid diseases or conditions, as well as age and sex. The risk adjustment also included median household income in the ZIP code of residence for each individual. For the SEER data, the researchers additionally stratified for the stage of a patient's cancer.

The researchers then performed identical analyses on both risk-adjusted

[data sets](#), calculating the probability of death at each hospital. In both analyses the hospitals were ranked in terms of three-year and five-year survival rates. The inclusion or exclusion of individual patients' cancer stage information did not significantly affect the rankings.

Looking Forward

Similar outcomes research using only administrative claims data is already under way nationally in cardiovascular disease. For example, the Centers for Medicare and Medicaid Services publishes risk-adjusted cardiovascular disease mortality rates for US hospitals.

"We hope to eventually do the same thing in [cancer](#)," said Dr. Bach. "More validation is needed of the risk adjustment metrics for hospitals, but I think we can dispense with the idea that we need patient-level data on [cancer stage](#) to evaluate hospitals."

Eventually, data on long-term survival may also help inform value-based payment initiatives that link reimbursement with quality outcomes.

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