

Are Increasing 5-Year Survival Rates Evidence of Success Against Cancer?

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JAMA. 2000;283:2975-2978.

Context Increased 5-year survival for cancer patients is generally inferred to mean that cancer treatment has improved and that fewer patients die of cancer. Increased 5-year survival, however, may also reflect changes in diagnosis: finding more people with early-stage cancer, including some who would never have become symptomatic from their cancer.

Objective To determine the relationship over time between 5-year cancer survival and 2 other measures of cancer burden, mortality and incidence.

Design and Setting Using population-based statistics reported by the National Cancer Institute Surveillance, Epidemiology, and End Results Program, we calculated the change in 5-year survival from 1950 to 1995 for the 20 most common solid tumor types. Using the tumor as the unit of analysis, we correlated changes in 5-year survival with changes in mortality and incidence.

Main Outcome Measure The association between changes in 5-year survival and changes in mortality and incidence measured using simple correlation coefficients (Pearson and Spearman).

Results From 1950 to 1995, there was an increase in 5-year survival for each of the 20 tumor types. The absolute increase in 5-year survival ranged from 3% (pancreatic cancer) to 50% (prostate cancer). During the same period, mortality rates declined for 12 types of cancer and increased for the remaining 8 types. There was little correlation between the change in 5-year survival for a specific tumor and the change in tumor-related mortality (Pearson $r=.00$; Spearman $r=-.07$). On the other hand, the change in 5-year survival was positively correlated with the change in the tumor incidence rate (Pearson $r=+.49$; Spearman $r=+.37$).

Conclusion Although 5-year survival is a valid measure for comparing cancer therapies in a randomized trial, our analysis shows that changes in 5-year survival over time bear little relationship to changes in cancer mortality. Instead, they appear primarily related to changing patterns of diagnosis.

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