

Conditional Survival in Anal Cancer: Results from the SEER Dataset 1988-2001

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Background

Survival statistics for patients with anal cancer are typically reported in terms of survival from time of diagnosis. However, for patients who have survived a period of time after diagnosis, conditional survival (CS) is a more clinically relevant measure, as it accounts for changes in risk over time¹. The purpose of this study was to estimate CS for anal cancer patients through analysis of large-scale cancer registry data.

Methods

Case Selection:

- All patients with cancer of the anus, anal canal, and anorectum, diagnosed between 1988-2001, were extracted from Surveillance, Epidemiology, and End Results 17 (SEER 17) database, Nov 2007 submission.
- Only "Actively Followed", "Malignant Behavior" were included.
- "Death Certificate Only", "Second and Later Primaries" were excluded.
- SEER*Stat 6.4.4 software utilized.

Conditional Survival:

- Let $S(t)$ be Kaplan-Meier survival at time t . Conditional survival, $CS(y|x)$, is the probability of surviving y years, given that the person has already survived x years. CS can be derived from Kaplan-Meier survival as follows:

$$CS(y|x) = \frac{S(x+y)}{S(x)}$$

- Five-year relative CS calculations were performed with stratification by SEER Historic Stage, age>60, sex, and race, for patients who had already survived up to 5 years from diagnosis.

Results

A total of 5,114 patients met the inclusion criteria

Table 1. Number (%) of patients in each subgroup. (N=5,114)

Stage		Sex	
Localized	2,403 (47)	Male	2,146 (42)
Regional	1,588 (31)	Female	2,968 (58)
Distant	449 (9)		
Unknown	674 (13)	Race	
		White	4,338 (85)
		Black	537 (11)
		Other	210 (4)
		Unknown	29 (1)
Age			
Age < 60 yrs	2,285 (45)		
Age > 60 yrs	2,829 (55)		

Results (cont.)

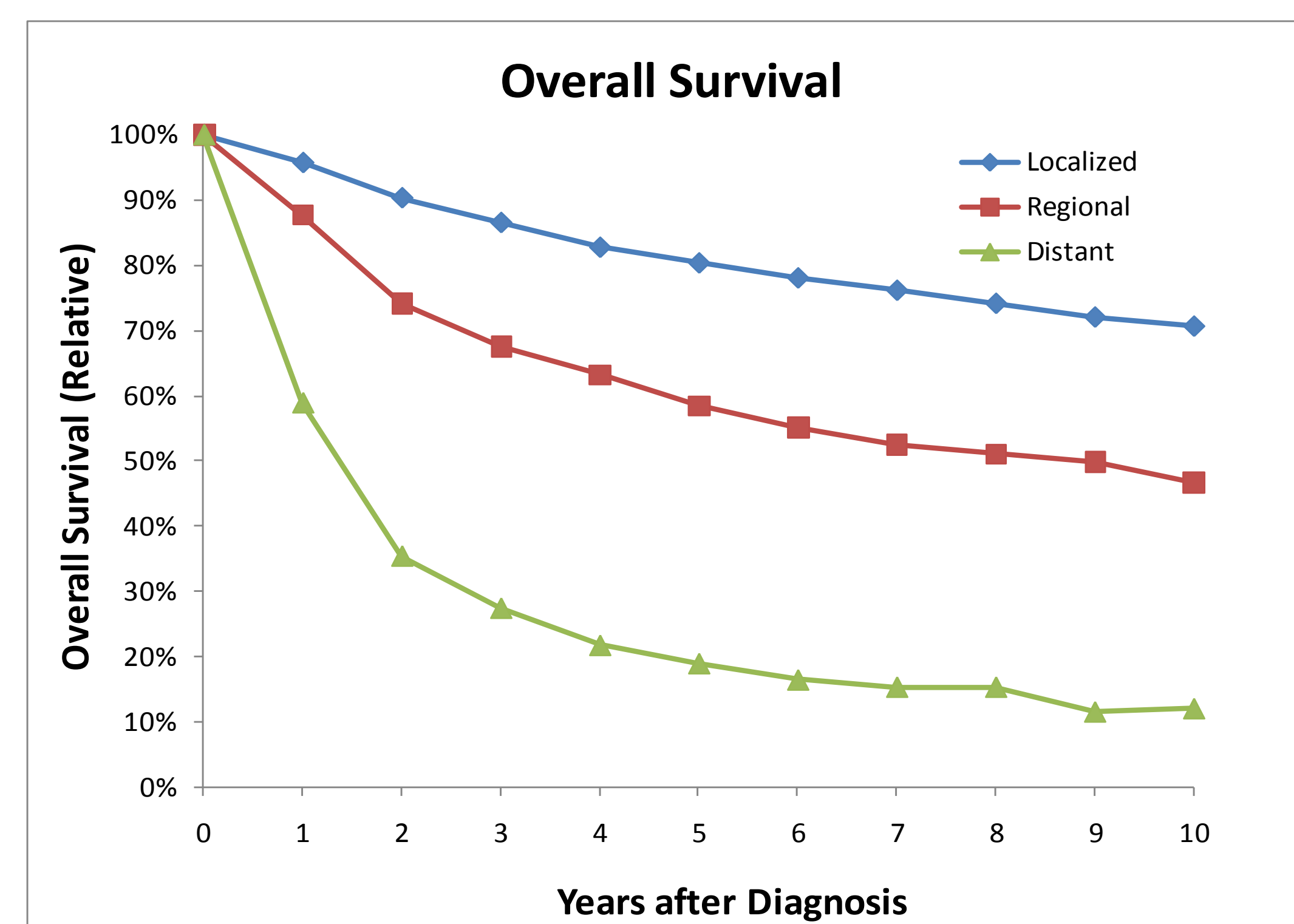


Figure 1. 10-year (relative) overall survival by SEER Historic Stage. These data were used to calculate the conditional survival graphs below.

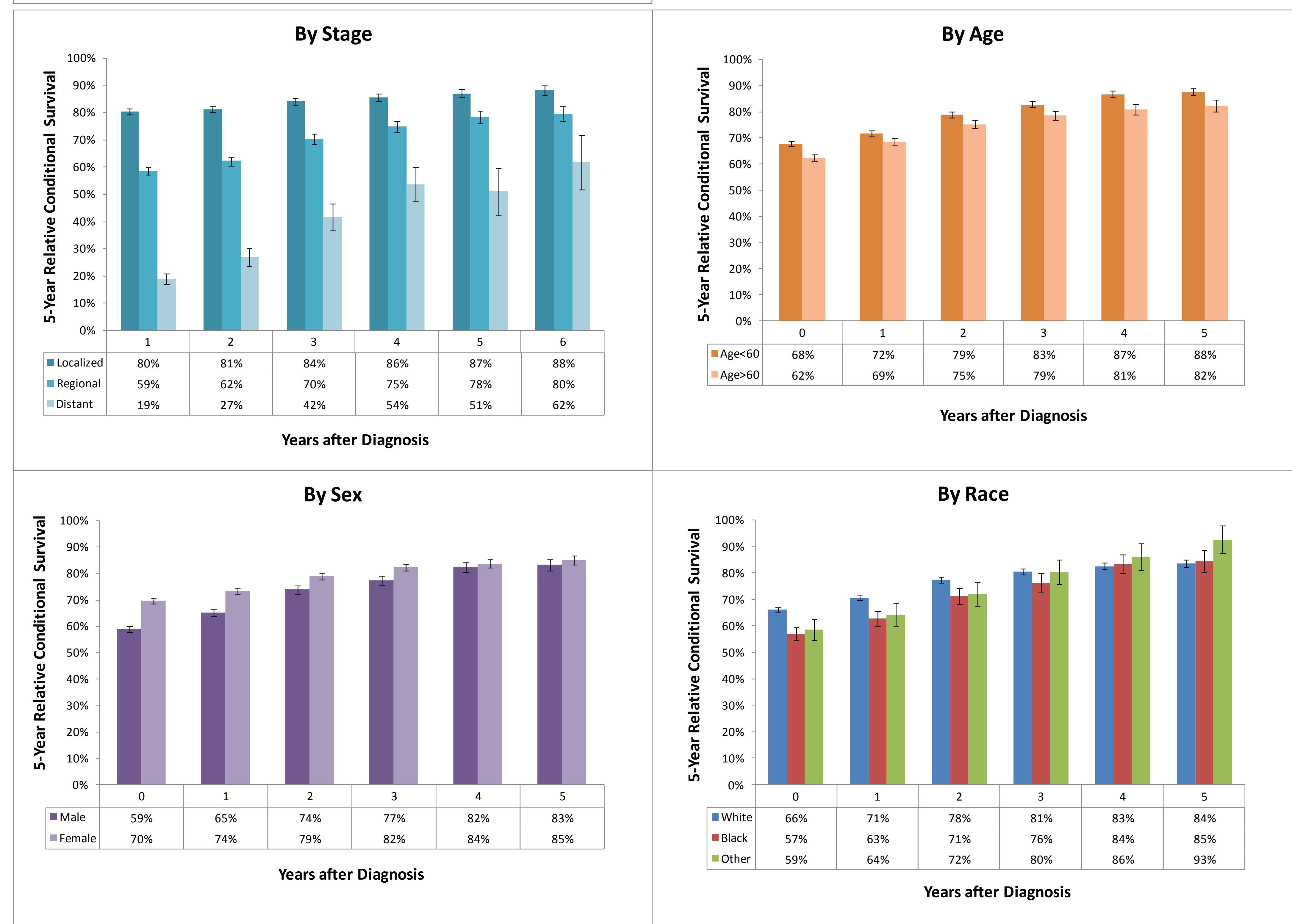


Figure 2. Five-year relative conditional survival stratified by stage, age, sex, and race. Each bar represents the likelihood that a patient will live an additional 5 years, given that s/he has already survived a period of time after diagnosis.

Conclusions

Prognosis improves over time for almost all subgroups of anal cancer patients but changes the most for patients with more advanced stage disease. For anal cancer survivors who have already survived a period of time following diagnosis and treatment, conditional survival provides a more relevant measure of changing prognosis than conventional survival statistics given at the time of diagnosis.

References

Henson DE, Ries LA. On the estimation of survival. *Semin Surg Oncol* 1994;10(1):2-6.

Acknowledgments

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