

Introduction

We had earlier proposed an increase in the age cut-off, used for the stage grouping in the 7th edition of AJCC-TNM for the well-differentiated thyroid cancer (WDTC), to 55 years.¹ This was incorporated in the 8th edition of TNM.² The present study compares the correlation of the 7th and the 8th editions of TNM stage grouping with the disease-specific (DSS) and the relapse-free survival (RFS) of the differentiated thyroid cancer in a larger population-based cohort.

Patients

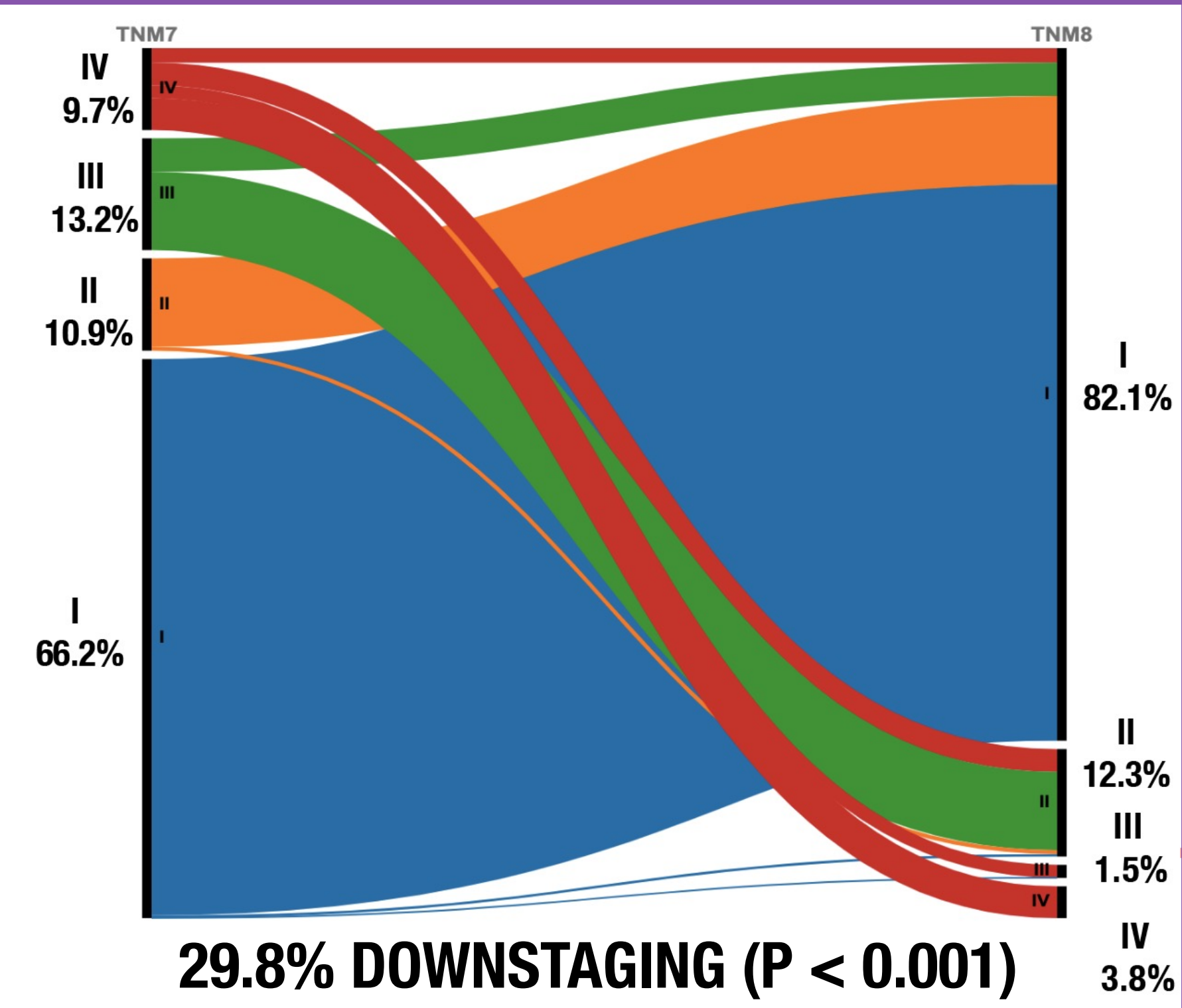
- Data source: Population-based thyroid cancer cohort patients diagnosed during 1970-2015 in Manitoba, Canada.
- Study group: 2884 consecutive patients .
- Median follow-up of 11.5 years.

Methods

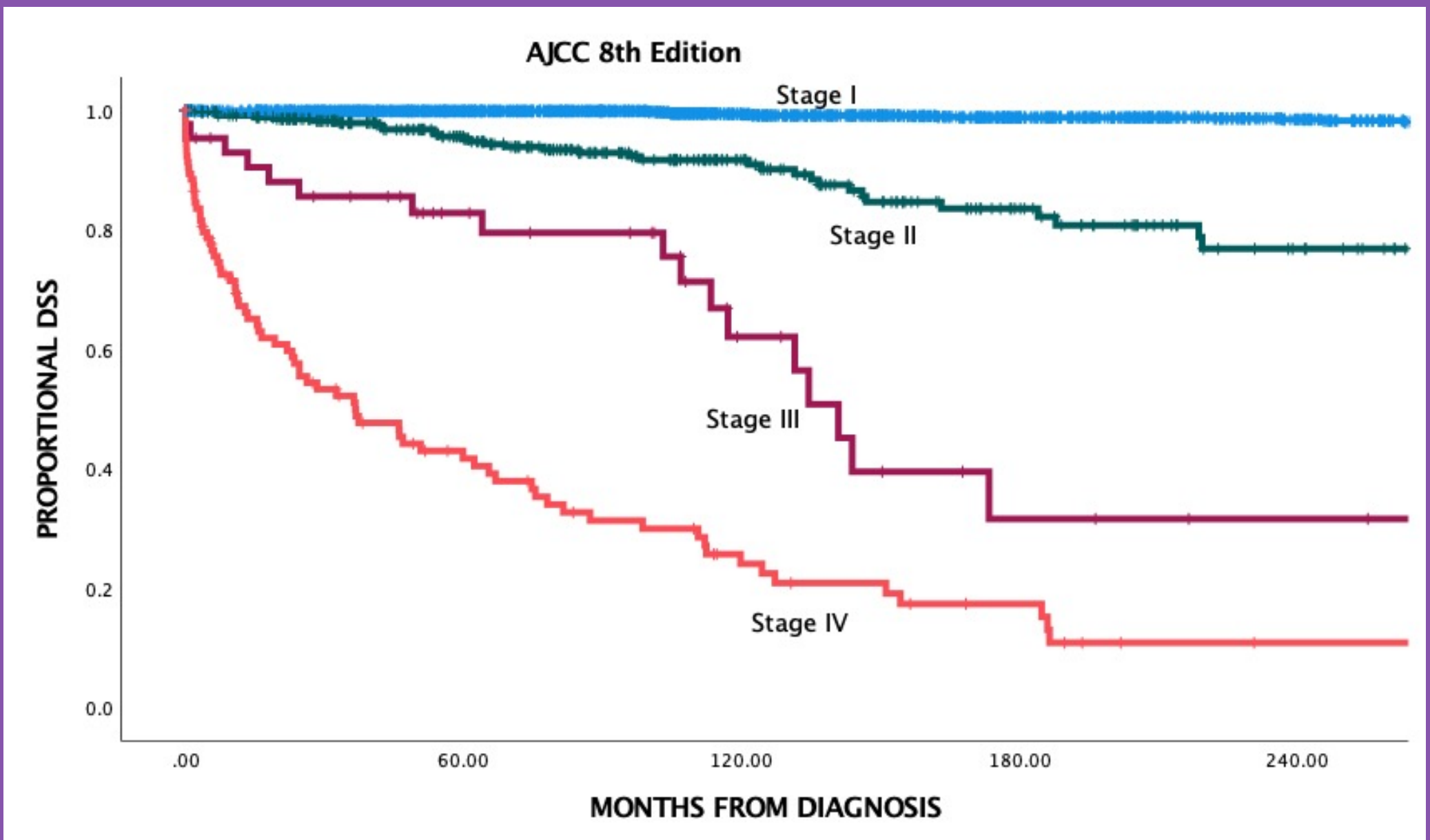
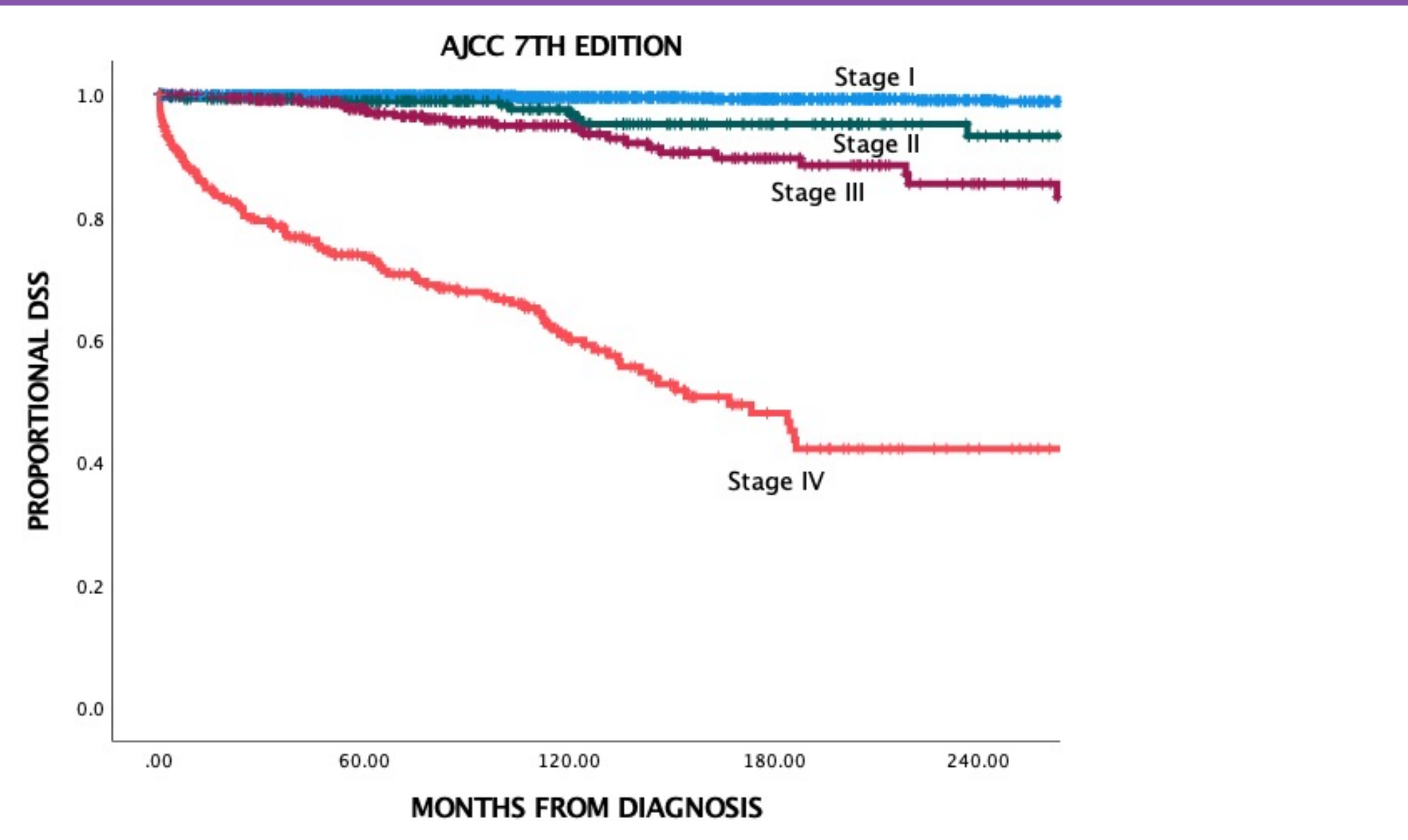
- RFS and DSS using the Kaplan Meier method.
- Chi-square test was used for intergroup comparisons and Log Rank (Mantel-Cox) for comparing survival for various stages of the WDTC.
- Multivariable analysis with Cox-proportional hazard model was used to assess the independent impact of different prognostic factors.
- Akaike information criterion (AIC), a measure of statistical model fit, was used to identify the better TNM staging model.
- Delta AIC, Akaike weight, and evidence ratios were calculated to compare the relative strength of these models.

Results

- Mean Age: 48.3(+/- 16.8) years, Male: Female 1:3.
- Papillary TC 2432(84.3%), Follicular TC 317(11%), Hurthle Cell TC 107(3.7%), Poorly Differentiated TC 25(1%)



- The survival prediction models incorporating the 8th edition had much lower AIC both for RFS (2804.7 versus 2838.9) and DSS (937.7 versus 970.9).
- 8th edition was better in predicting both RFS and DSS with nearly 100% certainty.
- The likelihood of the 7th edition being a better predictor of RFS than the 8th edition was only 1 in 1.1 x 10²⁰ and 1 in 8.8 x 10¹⁰ for DSS.



Factors affecting DSS (Cox Regression Model)					
7th Edition			8th Edition		
Age at Diagnosis	HR:1.1; 95% CI=1.03-1.07; p<0.001		Gender (Male vs Female)	HR:1.5; 95% CI=0.99-2.23; p=0.05	
Incompleteness of Resection	HR:3.9; 95% CI=2.42-6.3; p<0.001		Age at Diagnosis	HR:1.0; 95% CI=1.02-1.06; p<0.001	
Stage II vs I	HR:2.8; 95% CI=1.09-7.24; p=0.03		Incompleteness of Resection	HR:3.0; 95% CI=1.82-4.79; p<0.001	
Stage III vs II	HR:5.4; 95% CI=2.51-11.76; p<0.001		Stage II vs I	HR:6.0; 95% CI=3.07-11.86; p<0.001	
Stage IV vs I	HR:19; 95% CI=8.72-41.76; p<0.001		Stage III vs II	HR:17; 95% CI=7.32-39.76; p<0.001	
			Stage IV vs I	HR:43.8; 95% CI=21.26-90.62; p<0.001	
Factors affecting RFS (Cox Regression Model)					
7th Edition			8th Edition		
Gender (Male vs Female)	HR:1.4; 95% CI=1.09-1.79; p=0.007		Gender (Male vs Female)	HR:1.5; 95% CI=1.15-1.87; p=0.002	
Incompleteness of Resection	HR:5.2; 95% CI=3.88-6.97; p<0.001		Age at Diagnosis	HR:1.0; 95% CI=0.97-0.99; p<0.001	
Stage II vs I	HR:1.6; 95% CI=1.00-2.61; p=0.048		Incompleteness of Resection	HR:3.9; 95% CI=2.92-5.45; p<0.001	
Stage III vs II	HR:1.9; 95% CI=1.32-3.00; p=0.001		Stage II vs I	HR:4.8; 95% CI=3.35-7.13; p<0.001	
Stage IV vs I	HR:6.9; 95% CI=4.67-10.24; p<0.001		Stage III vs II	HR:9.7; 95% CI=5.54-17.27; p<0.001	
			Stage IV vs I	HR:28.9; 95% CI=18.24-45.82; p<0.001	

Conclusions

Our study proves with a very high level of certainty that AJCC 8th edition offers a better correlation with both DSS and RFS of WDTC.