

Gleason grade progresses in a race-dependent manner

Creed JH^a, Awasthi S^a, Yamoah KJ^a, Gerke TA^a

^aMoffitt Cancer Center, Tampa, FL

Introduction and Objectives

In prostate cancer (PCa) patients who undergo radical prostatectomy, Gleason grade is assessed at biopsy and then again post-surgery. Upgrading from clinical to pathological Gleason has been observed in 20-40% of men and has important clinical implications[1, 2]. Debate exists as to whether Gleason biologically progresses or is a fixed feature of the tumor, with some research suggesting that differences in clinical and pathological Gleason occur as a result of sampling variability [3]. Conflicting evidence suggests differences in Gleason upgrading in African American men (AAM) compared to European American men (EAM)[4].

The National Cancer Database Cohort

- NCDB cohort consists of 1380357 prostate cancer cases diagnosed between 2010-2014
- Inclusion criteria: self-identified as Black or White, underwent radical prostatectomy, no evidence of metastatic disease at diagnosis (n=213956)
- Gleason upgrading:** an increase in pathologic Gleason category (6, 3+4, 4+3, 8, 9-10) from clinical Gleason category
- Time to treatment (TTT):** number of days from prostate cancer diagnosis to surgery

	AAM (n=28280)	EAM (n=185676)	pvalue
Age at Diagnosis			
Median (range)	59 (29-90)	62 (28-90)	< 2.2e-16
Tumor Size, mm			
Median (range)	16 (1-988)	16 (1-988)	0.26
PSA			
Median (range)	6.10 (0.10-98.00)	5.60 (0.10-98.00)	< 2.2e-16
Number of cores			
Median (range)	12 (1-101)	12 (1-101)	0.01
Time to treatment, months			
Median (range)	2.4 (0-54.85)	2.2 (0-58.96)	< 2.2e-16
Gleason upgrading			
Present	7844 (27.7%)	52115 (28.1%)	0.25
Absent	20436 (72.3%)	133561 (71.9%)	

Methods

- Relative risk ratios and 95% CI of upgrading per 30 day increase in TTT
- Multivariable Poisson regression models adjusted for: biopsy Gleason, race, age, and tumor size
- Models stratified by race

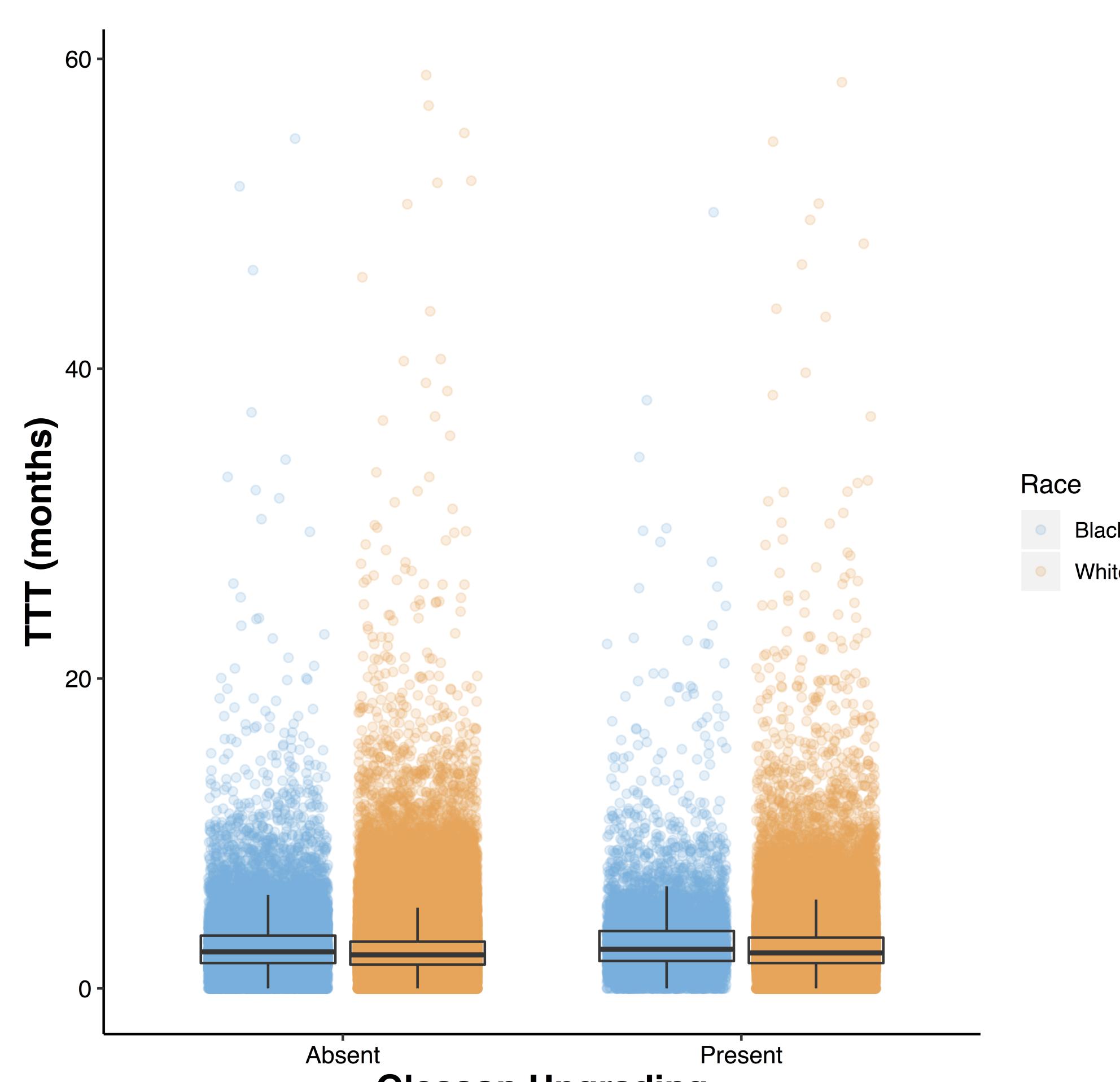


Figure 1: TTT (months) was greater in those with Gleason upgrading, both unadjusted and when stratified by race.

Results

- Gleason upgrading in 59959 (28%) of patients
- Longer TTT in those with upgrading than those with stable/decreasing Gleason (2.3 vs 2.2 months, p<2.2e-16)
- For each additional month in TTT, 1.39% increased relative risk in upgrading
- 3.30% risk in AAM vs 1.05% in EAM
- 10%, 12%, 13%, 13% and 15% increased relative risk at 60, 90, 120, 150 and 150+ days TTT compared to treatment in the first 30 days

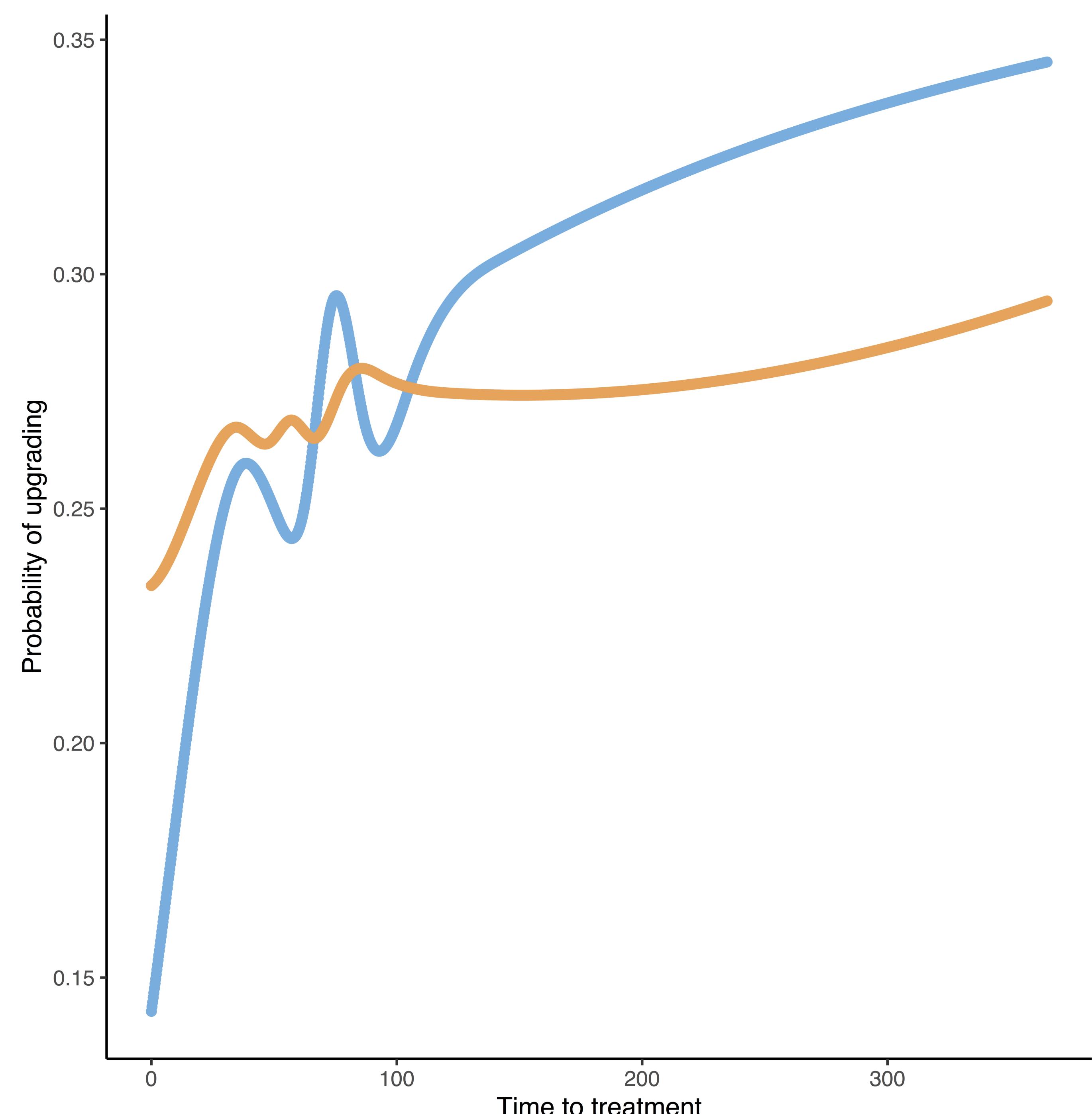


Figure 2: Probability of upgrading over the first year post-diagnosis in AAM (blue) and EAM (orange) from a spline model, using population median for biopsy Gleason, age and tumor size.

Conclusions

- Gleason grade progresses over time
- Progression is more sensitive to TTT in AAM than EAM, suggesting that prostate cancers may progress more rapidly in AAM

References

- Chun, FK, Steuber, T, Erbersdobler, A, et al. Development and internal validation of a nomogram predicting the probability of prostate cancer Gleason sum upgrading between biopsy and radical prostatectomy pathology. *Eur. Urol.*, 49, 5:820-826 May 2006.
- Epstein, JI, Feng, Z, Trock, BJ, Pierorazio, PM. Upgrading and downgrading of prostate cancer from biopsy to radical prostatectomy: incidence and predictive factors using the modified Gleason grading system and factoring in tertiary grades. *Eur. Urol.* 61, 5:1019-1024 May 2012.
- Truong, M., Slezak, J. A., Lin, C. P. et al. Development and multi-institutional validation of an upgrading risk tool for Gleason 6 prostate cancer. *Cancer*, 119(22):3992-4002, Nov 2013.
- Jalloh, M, Myers, F, Cowan, JE, et al. Racial variation in prostate cancer upgrading and upstaging among men with low-risk clinical characteristics. *Eur. Urol.*, 67, 3:451-457, Mar 2015.