Trends in High-Grade Prostate Cancer at Diagnosis in the United States from 2004 - 2022

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INTRODUCTION

Prostate cancer ranges from indolent to aggressive disease.

Changes in tumor biology and diagnostics (e.g., MRI-targeted biopsy) may contribute to **increased high-grade diagnoses.**

We aim to evaluate temporal trends in high-grade prostate cancer in the United States from 2004-2022.

METHOD

Cohort: 2.26 million men with prostate cancer (18.8% with high-grade) from 2004-2022 (2025 NCDB)

High-grade: Gleason score ≥ 8 (Grade Group ≥ 4)

Descriptive analyses:

- % of high-grade diagnoses by biopsy practice eras (2004–2012, 2013–2017, 2018–2022)
- Annual median PSA change (high- vs. lower-grade diagnoses)

Multivariable analysis:

- Logistic regression modeling odds of high-grade diagnosis
- Covariates: age, race, treatment facility type

RESULTS

Fig. 1: High-Grade Diagnoses Over Time

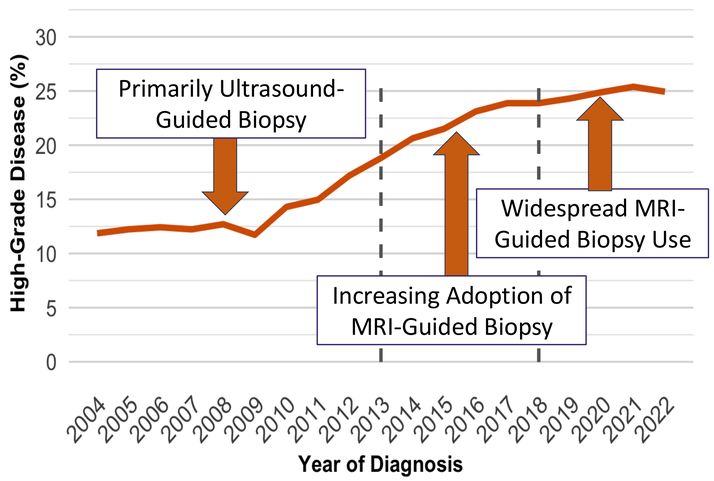

Fig. 1*: Rising high-grade trend** *relative to ultrasound-guided to MRI-guided biopsy shift. Proportion* ***doubled *from 2004 to 2022 (11.9% to 24.9%).*

Fig. 2: Median PSA at Diagnosis Over Time (by Grade)

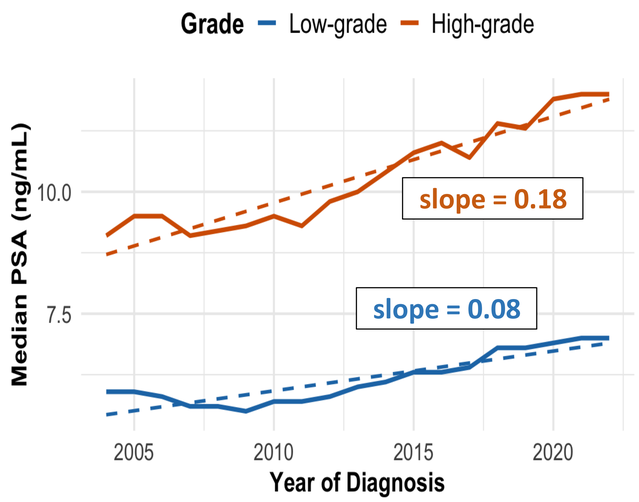

Fig. 2: *Median PSA rose overall. Rate of increase is* ***steeper for high-grade tumors*** *(0.18 vs 0.08 per year).*

Fig. 3: Odds of High-Grade Diagnosis

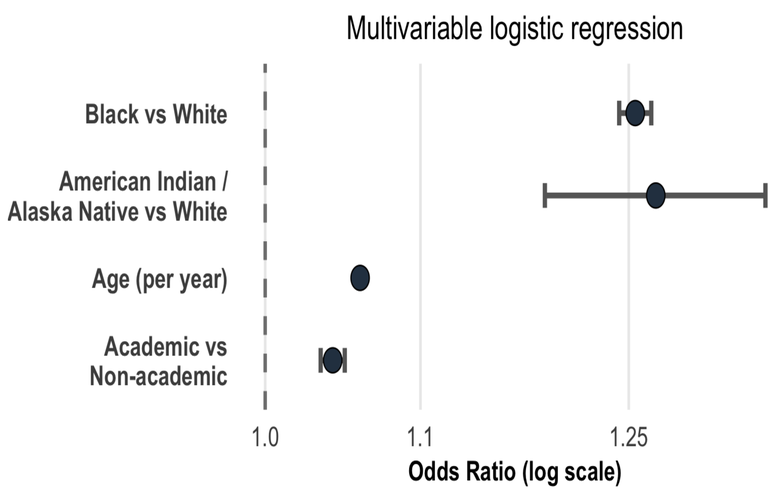

Fig. 3:

- *African American vs White:* ***OR 1.25*** *(95% CI 1.24–1.27)**
- *American Indian/Alaska Native vs White:* ***OR 1.27*** *(95% CI 1.19–1.36)**
- *Increasing age:* ***OR 1.06 per year*** *(95% CI 1.058–1.059)**
- *Diagnosis at an* ***academic center*** *vs non-academic:* ***OR 1.04*** *(95% CI 1.03–1.05)**

**95% CI has p<0.001*

CONCLUSIONS

- High-grade diagnoses **more than doubled from 2004–2022**, coinciding with MRI-guided biopsy adoption & potentially reflecting **evolving pathology grading or diagnostic thresholds.**
- Steeper PSA rise in high-grade disease may suggest **improved detection** rather than biologic change.
- Higher odds of high-grade in **African American and AI/AN men**; risk rises **~6% per year of age.**
- Modest effect sizes may have large population impact. Benefits of advances may be unevenly distributed.

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