

PREDICTING THE IMPACT OF CONTINUED TOBACCO USE AND TIMING OF SMOKING CESSATION AMONG HEAD AND NECK CANCER PATIENTS IN THE US

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Introduction and Objective

- More than 75% of head and neck cancers (HNC) are attributable to tobacco use.
- More than one third of patients with HNC continue to smoke even after cancer diagnosis.
- Randomized clinical trials (RCTs) show that continued tobacco use among HNC patients decreases treatment efficacy, increases risk of disease recurrence and second primary tumors, and impacts short-term survival.
- Population-level long-term impact on continued tobacco use and benefits of smoking cessation among HNC patients have never been evaluated.

Objective

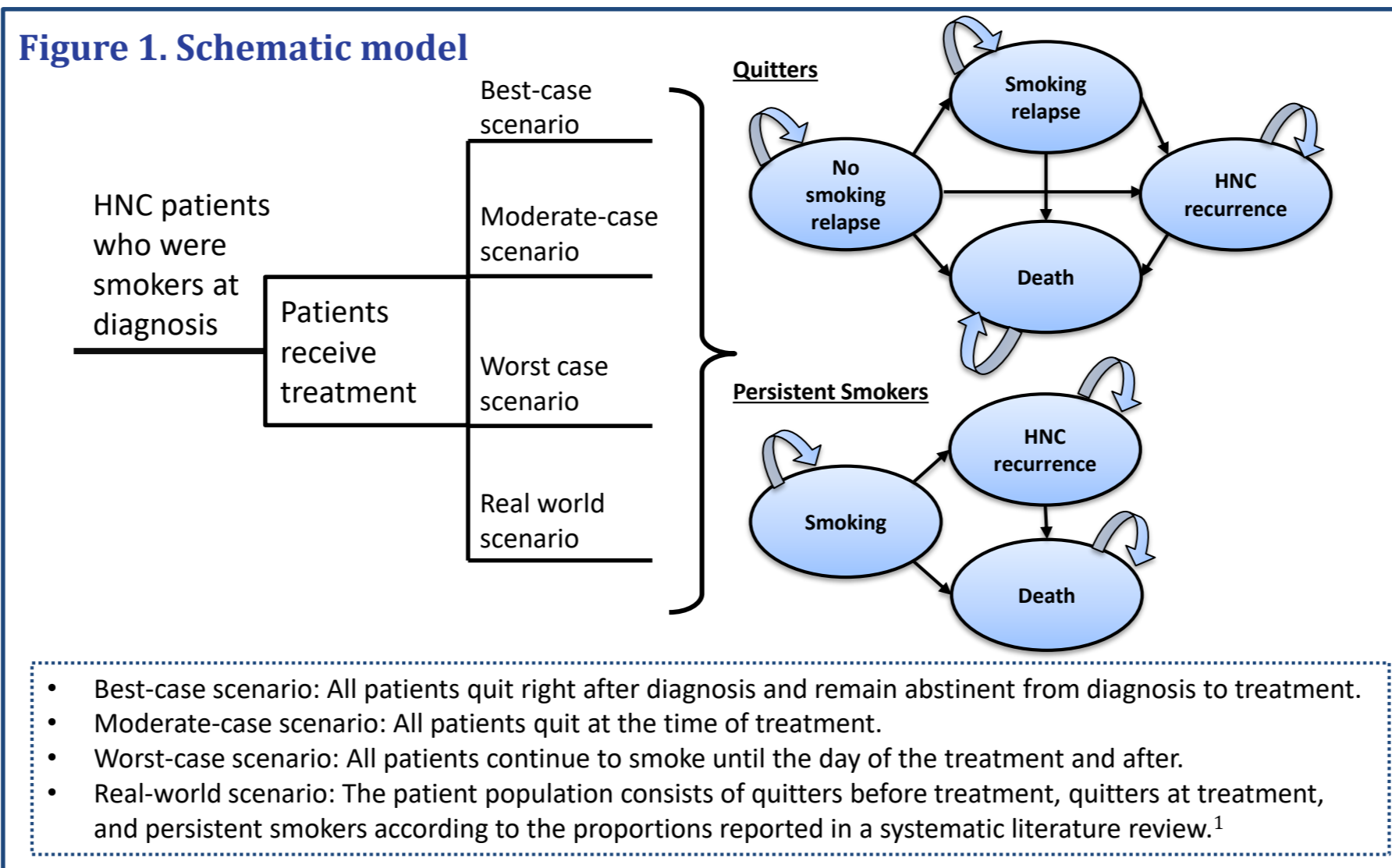
- Our objective was to project long term outcomes of continued tobacco use among HNC diagnosed patients considering various scenarios of smoking cessation.

Methods

Model Overview

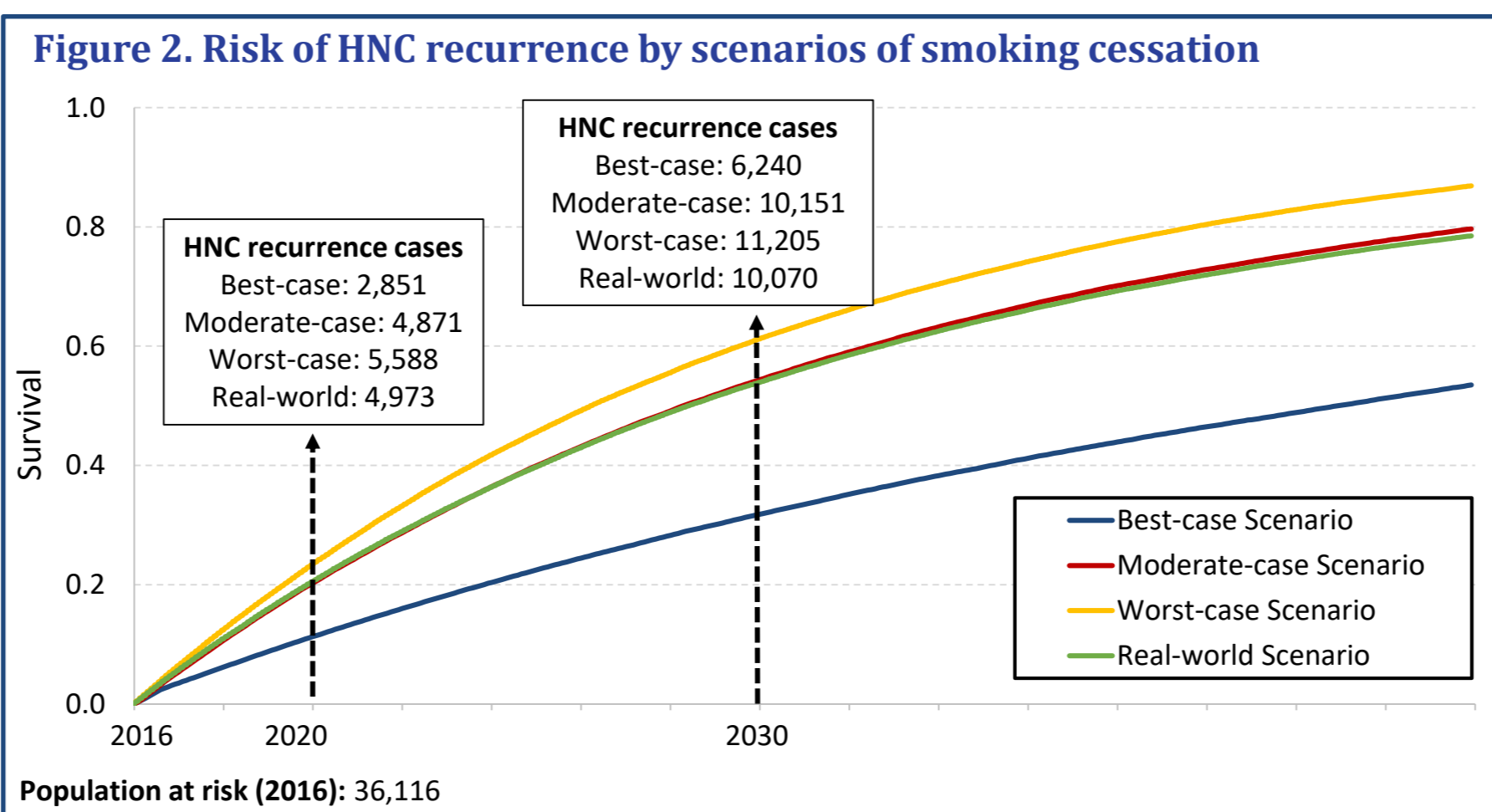
- We used individual-level state-transition model to simulate patients diagnosed with HNC who were current smokers at the time of diagnosis.
- Smoking status at diagnosis was obtained from the previous systematic literature review data.¹
- Time-dependent transition probabilities for smoking relapse, HNC recurrence, and death by smoking status were extrapolated from the previous published trials^{2,3,4} and SEER-Medicare database.
- Best fitted distributions were selected based on the goodness-of-fit metrics for all the transition probabilities derived from the cumulative risk and survival curves.

Figure 1. Schematic model



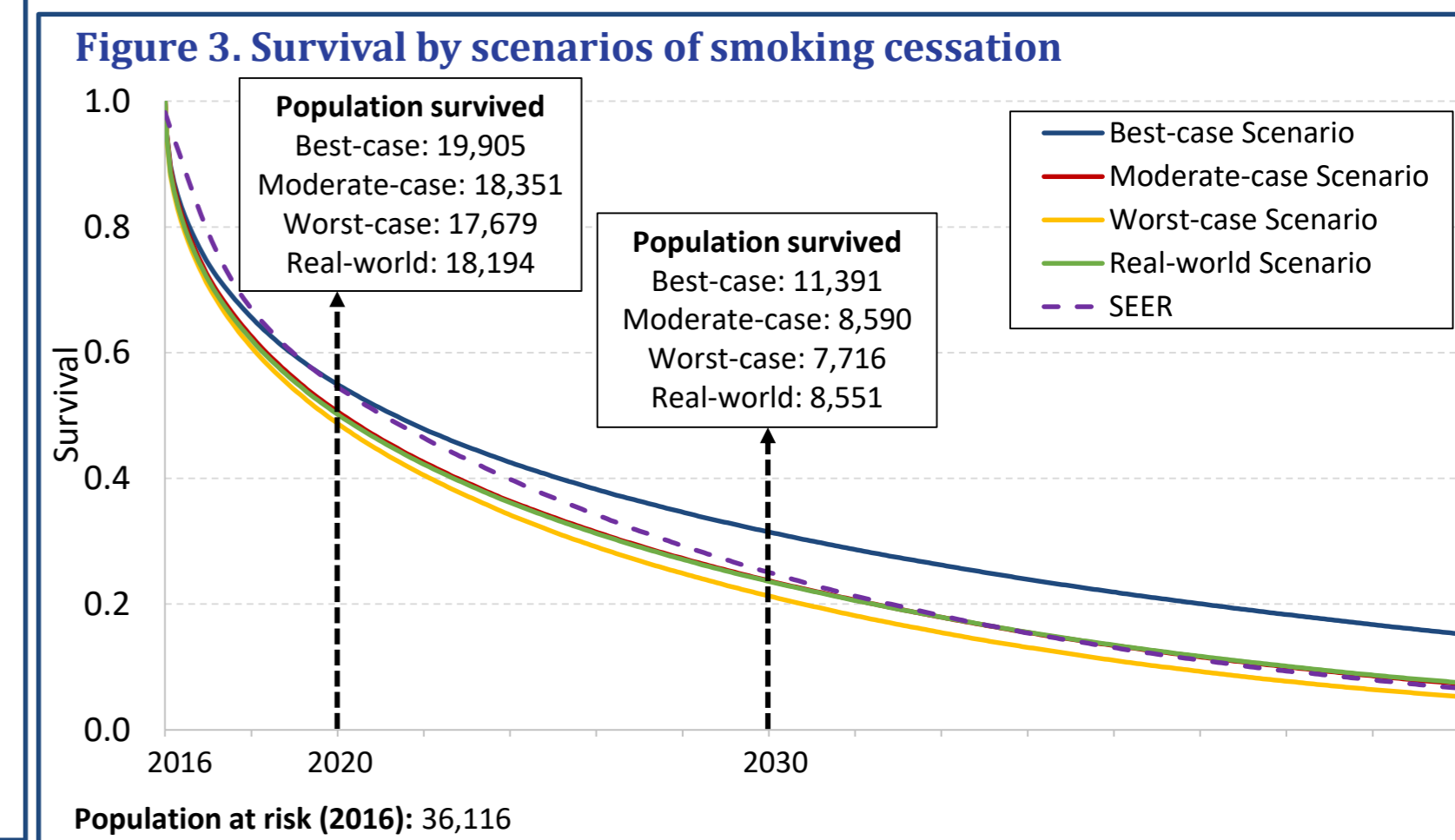
Results

Figure 2. Risk of HNC recurrence by scenarios of smoking cessation



- By 2020, the best-case (all quit before treatment) scenario can prevent 2,122 HNC recurrence compared to the real-world scenario.

Figure 3. Survival by scenarios of smoking cessation



- By 2020, the best-case (all quit before treatment) can prevent 1,711 deaths compared to real-world scenario.

Conclusion

- Abstaining to smoke after cancer diagnosis among HNC patient has the potential to decrease population-level burden of HNC by decreasing cancer recurrence and improving survival.

References

1. Burris JL, Studts JL, DeRosa AP, Ostroff JS. Systematic Review of Tobacco Use After Lung or Head/Neck Cancer Diagnosis: Results and Recommendations for Future Research. *Cancer Epidemiol Biomark Prev Publ Am Assoc Cancer Res Cosponsored Am Soc Prev Oncol*. 2015;24(10):1450-1461. doi:10.1158/1055-9965.EPI-15-0257
2. Sitas F, Weber MF, Egger S, Yap S, Chiew M, O'Connell D. Smoking Cessation After Cancer. *J Clin Oncol*. 2014;32(32):3593-3595. doi:10.1200/JCO.2014.55.9666
3. Meyer F, Bairati I, Fortin A, et al. Interaction between antioxidant vitamin supplementation and cigarette smoking during radiation therapy in relation to long-term effects on recurrence and mortality: A randomized trial among head and neck cancer patients. *Int J Cancer*. 2008;122(7):1679-1683. doi:10.1002/ijc.23200
4. Simmons VN, Litvin EB, Jacobsen PB, et al. Predictors of smoking relapse in patients with thoracic cancer or head and neck cancer. *Cancer*. 2013;119(7):1420-1427. doi:10.1002/cncr.27880