

Supplemental Appendix for:
Cost-effectiveness of nivolumab in recurrent metastatic head and neck squamous cell carcinoma
Mahdi Zargar et al.

Appendix S1
Detailed results of the one-way sensitivity analysis

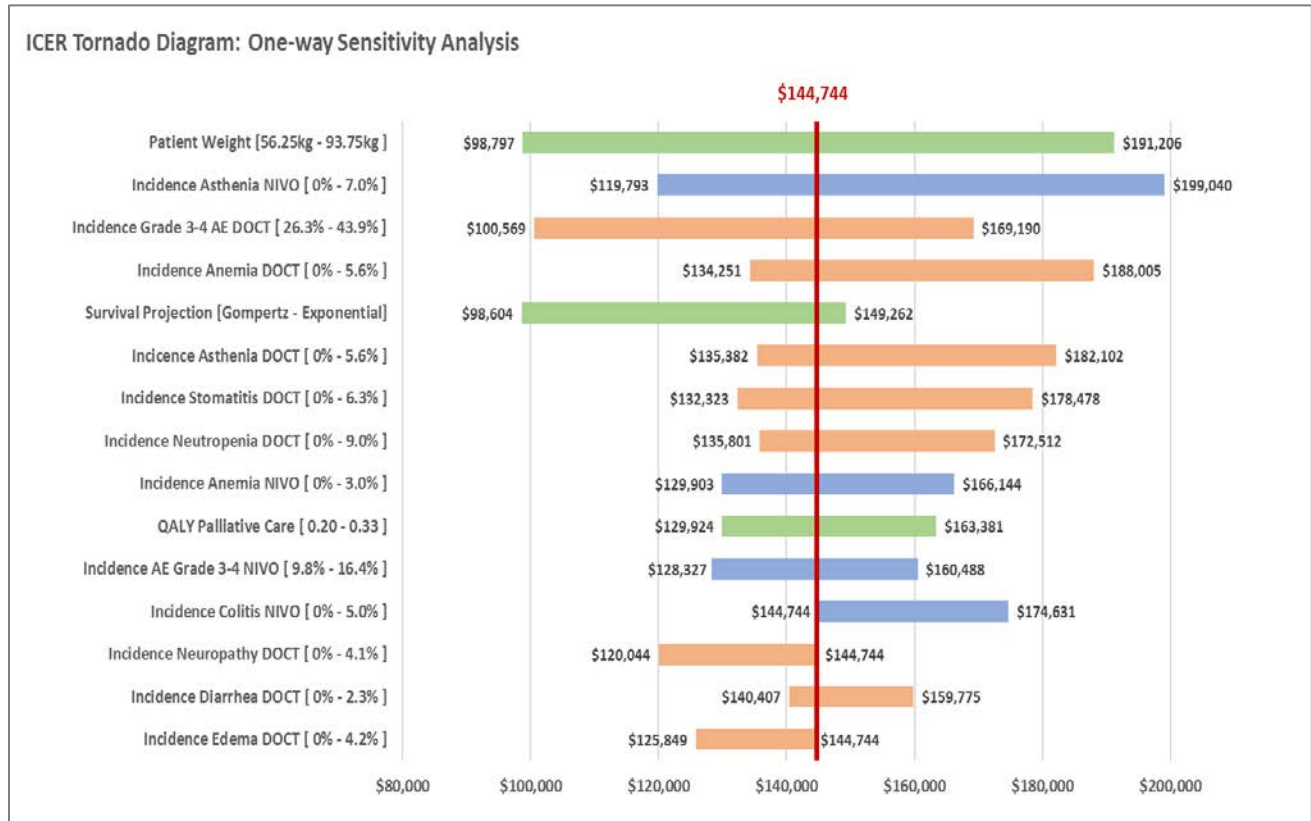
The tornado diagram (Figure 1 Appendix 1) shows the top 15 variables that could impact the ICER of NIVO vs. DOC in our analysis. Of the top 15 variables affecting the ICER of NIVO, 9 are related to the incidence of the most common adverse effects of DOC. For each of these variables a higher incidence corresponds with a lower ICER and a lower incidence corresponds with the higher ICER in the range shown. Overall, the results of the one-way sensitivity analysis show that there are more factors that could increase the ICER of NIVO above our base case of \$144,744 CAD.

In addition to all the model variables, we also performed a one-way sensitivity analysis on various survival distributions to see how it would affect our projected survival and by extension the ICER for treatment. We used Weibull, Gompertz, log-logistic, log-normal and exponential distributions to project OS and PFS curves. The impact on the ICER ranged from a low of \$98,604 for Gompertz to a high of \$149,262 for exponential distribution (Figures 2-5 Appendix 1). Extrapolation methodology of the PFS curve had very little impact on our model we tested this by keeping nivolumab PFS flat to 60 months and the impact to the ICER was negligible. This is because very few patients are progression free by the end of the study in both arms.

Interestingly, the health-related quality of life in palliative care patients was one of the factors affecting the ICER of NIVO. The value used in our base case assumption was 0.267 QALY for a patient in palliative care. Increasing or reducing this value by 25% resulted in a range of \$129,903 - \$163,381 at the upper and lower ends respectively. Although we did not have direct access to the results of the EQ-5D VAS score of patients in the CheckMate 141 trial, the authors reported that the patient reported outcomes were much better in the NIVO treatment arm even after progression of their disease, possibly because treatment with NIVO had fewer treatment-related side effects¹¹. A one-way sensitivity analysis on patient-reported outcomes in palliative care shows that if there is an average utility difference of 0.107 (40%) between patients on NIVO vs. DOC once their disease progresses, then NIVO would be cost-effective. This reported benefit of NIVO on patients with progressive disease has been seen in other trials and warrants further investigation.

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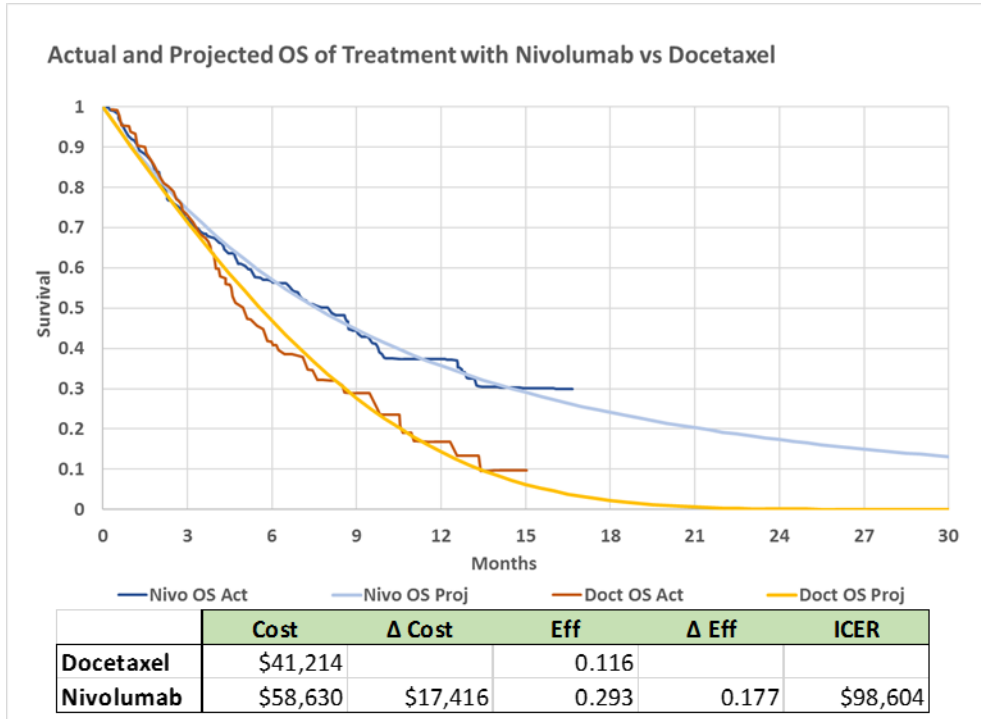
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Figure S1: Tornado Diagram



This one-way sensitivity analysis presented as a tornado diagram shows the impact of the top 15 variables in our model on the ICER of treatment with NIVO in end stage HNSCC. The variables related to NIVO are shown in blue while the variables related to DOCT are shown in orange. Independent patient characteristics are shown in green. For NIVO related variables the lower limit of the range corresponds to a lower ICER while the upper limit corresponds to a higher ICER. For DOCT related variables the opposite is true; the lower limit of the range represents an increase in the ICER while the upper represents a reduction in the ICER. Overall this diagram shows that there are more variables that could significantly increase the ICER than those that could significantly decrease the ICER. Patient weight is the most important factor affecting the ICER of treatment with NIVO. NIVO nivolumab, DOCT docetaxel

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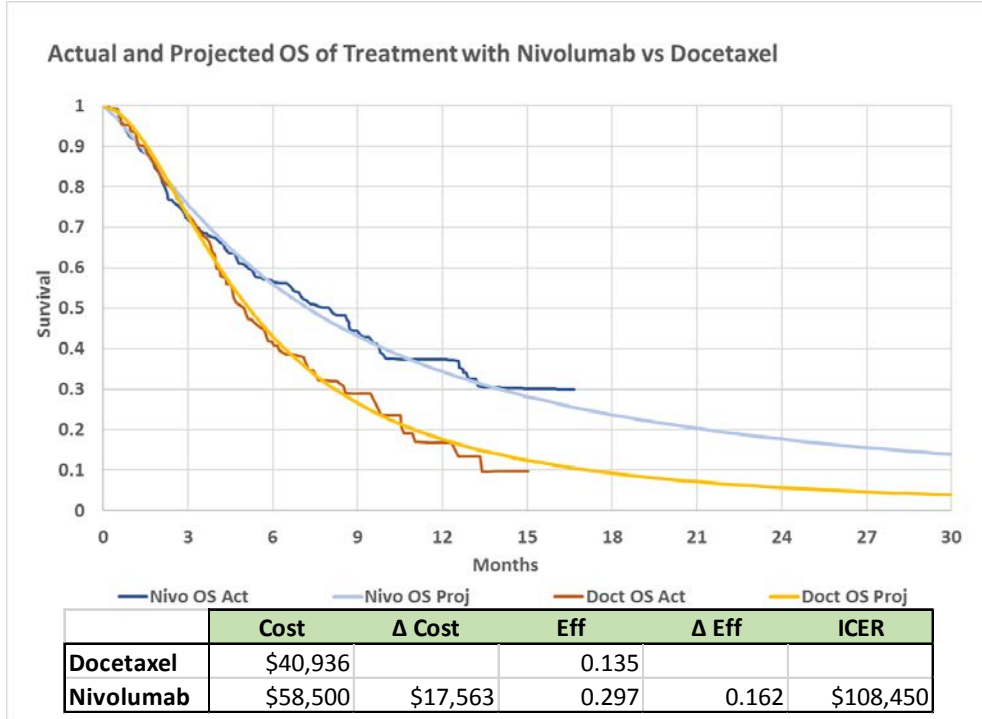
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Figure S2: Gompertz Survival Projection



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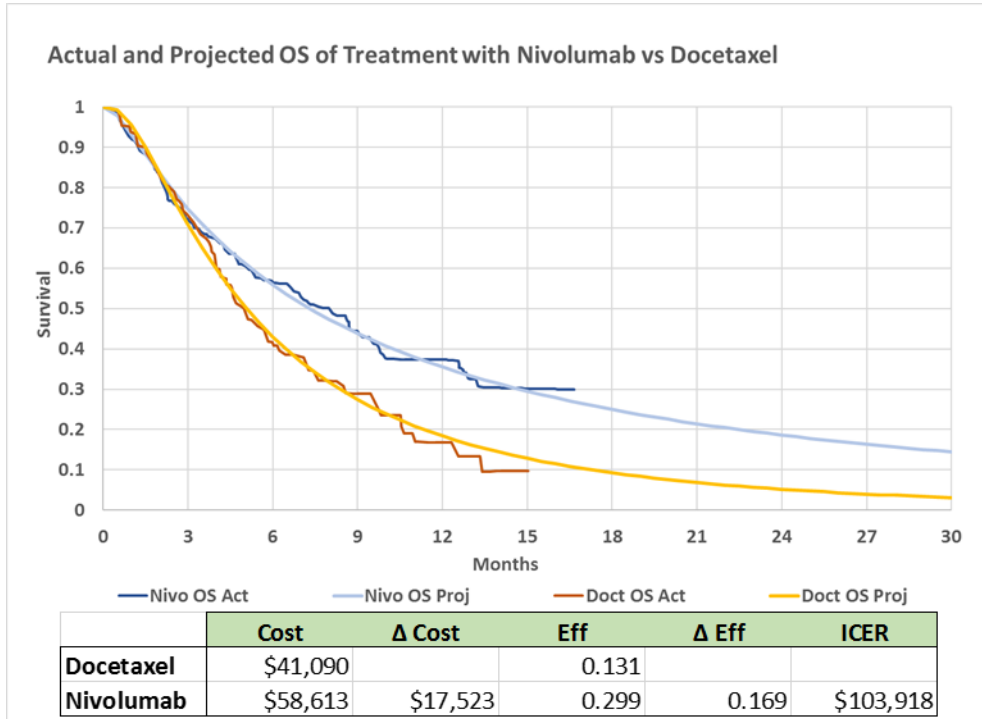
Figure S3: Log-Logistic Survival Projection



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Figure S4: Log-Normal Survival Projection



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Figure S5: Exponential Survival Projection

