Validation of a Cost-effectiveness Model Comparing Accuracy of Genetic Tests for BRCA Mutations

Background
• A Markov decision analytic model was developed de novo to compare the economic impact of BRCA testing accuracy on quality adjusted survival and costs in women at high risk of hereditary breast and ovarian cancer (HBOC)

Objectives
• This analysis aims to validate the decision analytic model by comparing selected model outputs with model development data so

Methods
Model Design
Model Structure (Figure 1)
• Markov model consisted of 7 possible health states (Figure 2):
  o No cancer
  o Early breast cancer
  o Advanced breast cancer
  o Early advanced ovarian cancer
  o Advanced ovarian cancer
  o Simultaneous BC and OC
  o Death
• The clinical history of each woman, including cancer history and preventative treatments received, was captured

Base Case
• Women (age 20+) with a high risk of HBOC undergoing BRCA testing

Time Horizon / Cycle Length
• Over a female lifetime, with 1-year cycles

Perspective
• U.S. Third-party payer

Model Validation
• Model validation was based on lifetime prevalence of BC and OC and lifetime risk of cancer-related deaths among all women tested, REFERENCES 1-4
• A microsimulation of 10,000 women was used to estimate the cost-effectiveness from US payer perspective over a woman’s lifetime

Results
• The model predictions of lifetime prevalence and cancer-related deaths of both BC and OC were similar to estimates reported by SEER database

Conclusions
• This suggests that the model could serve as a reliable tool to support decision making based on the success in predicting real-world estimates.
• High rates of risk reducing strategies among patients having BRCA mutation may explain the similar rates of both breast and ovarian cancer in this high risk population.

Acknowledgments
This project was funded by unrestricted grant from Myriad Genetics.