Demonstrate Values to Stakeholders: 2021 Full-year Marketing mix models

* Determined contribution to sales and return on investment for all Keytruda consumer promotions
* Calculated performance metrics for approximately 28 channels/vendors for Keytruda
* Collectively informed roughly $144M in promotional investment

Demonstrate Values to Stakeholders: IPF Planning

* Leveraged inputs from marketing mix models to determine optimal budgeting scenarios and resource allocation for Keytruda consumer channels
* Worked closely with finance and brand teams to ensure appropriate channel spend bounds
* Collectively informed roughly $174M in promotional investment

Demonstrate Values to Stakeholders: TV Business Case

* Evaluated impact of Linear TV on Keytruda sales
* Assessed the possibility and use of incorporating data from the vendor VideoAmp to supplement TV GRPs provided by Nielsen
* Worked closely with brand teams to decide and justify future spend in 2023
* Informed roughly $110M in promotional investment

Demonstrate Values to Stakeholders: General Marketing/Brand Support Projects

* Adherence curves: Built patient adherence curves for finance
* March Sales Spike: Assessed possible consumer promotion contributors to March 2022 sales spike for Keytruda
* Optimal frequency analysis: worked with Crossix to calculate ROI for digital promotion as a function of number of exposures; publisher level exposure targets changed as a result and future testing is under consideration

Drive Innovation by Digital and Data: Arcadia Text Messaging Campaign

* Developed foundation to sample from internal claims data to compare with an external vendors data (Arcadia)
* Leveraged leading evaluation metrics (standardized differences) to assess the balance between treatment arms
* Assessed efficacy of the text messaging campaign on increasing cancer screening rates. Further evaluation is expected to be conducted by IQVIA.
* Diagnosed inherent differences between data sets and challenges in analysis

Drive Innovation by Digital and Data: Innovation/Novel Impact Assessment: Lung Precision Marketing

* Leveraged a novel tool (Google’s causalImpact) to create a synthetic control to estimate the potential gain in increasing spend in Tier 1 Local Health Markets (LHMs), and loss in removing spend in Tier 4 LHMs
* Findings shared in meeting with Oncology AVP and used to guide future spending in Tier 1 and Tier 4 markets

Drive Innovation by Digital and Data: Health Map

* Created groundwork to optimally match treated and control patients to assess promotion efficacy
* Implemented novel matching algorithms (BigMatch) to more efficiently match on large data sets
* Used distance metrics that are deemed most appropriate by leading researchers on matching (robust Mahalanobis distance matching using propensity score calipers)
* Provide code to diagnose the performance of matching that is accepted in statistical literature (standardized difference)
* Suggested risk set matching to accommodate for difference in time between treated and control patients

Team Development/Innovation: Causal Inference Teaching

* Created a detailed write-up of a few key concepts in causal inference
* Introduced potential outcomes, a key assumption of ignorability (no unmeasured confounding), and popular causal inference techniques (matching and synthetic controls)
* Completed the write-up with examples, code, and analyses

Team Development/Innovation: Intern Mentoring

* Mentored Data Science intern Yishu Gong on her work in using causal inference techniques to evaluate the Next Best Experience (NBX)
* Taught, provided references, and aided in their use of regression discontinuity designs, bootstrapping, synthetic controls, and difference-in-difference methods
* Documented detailed, constructive criticism of Yishu’s final report to best guide future Merck data science teams in implementing causal inference techniques

Training & Compliance

* Update and comply with all training relating to data storage, usage, sharing, and compliance
* Adhered to guidelines from finance surrounding the sharing of sensitive financial information

Diversity & Inclusion

* Attended team meetings that contained diversity information and training as well as compassionate leadership training

Comments

I think I had a productive year which consisted of considerable growth in understanding the consumer and marketing space, especially considering my lack of knowledge in this space coming into the position. I was able to quickly come to speed and provide high value to the Keytruda and oncology marketing teams I supported through close collaboration. My knowledge in statistics and causal inference quickly translated to impactful campaign evaluations and innovative methodological approaches. As I depart from HHIAD and move to BARDS, I’m appreciative of the experiences I’ve had in handling the large scale data, improving my consultation skills, and developing and implementing innovative methodologies. I am also thankful for getting to learn from and work with so many great colleagues. I am excited to return to a space I am more familiar with in biostatistics research, meet new colleagues in MRL, and develop novel solutions for new stakeholders problems.