I1

I2

* <DF>Copay Design Tool: continued to work w/vendor (DataZymes) to create an Excel/R tool to automate copay design studies for national and state-based copay programs

I3

* <AS>Build Marketing Mix models for main Keytruda indications - Lung and non-Lung models to estimate the impact of HCP digital promotions on sales.

1. Tested a new data source – HCP level Claims data and multiple variations of modelling dataset from time aggregation to geography aggregation.
2. Compared % sales contribution between original DDD models and Claims models.
3. Created promotion response curves using additional Machine Learning techniques like GAM and Gradient Boost models.

I4

* <BB>Key: Developed DOMINO model to allocate KEYTRUDA promotion budget by HCP vs Consumer within each tumor. Scoring model used quantitative data like sales and impactable new patient starts and qualitative data like competition, sales force promotion, tumor prioritization, etc. Project DOMINO required coordination among many Merck teams and consulting companies as well as getting buy-in from MLT.
* <BB>Key: Incorporated impactable new patient start methodology into other KEYTRUDA projects to answer business questions regarding tumor prioritization and staffing.

I5

* <BB>On-boarded four vendors (Healthcasts, Haymarket, Deep Intent and Alert Marketing) by reviewing assets they offer and the HCP level data they will provide. Determined how to map their offerings and actions to our standard values while being consistent with existing vendor mappings.
* <BB>Worked with Digital Engagement Capabilities team and Solved to establish templates and SOPs to ensure we receive accurate promotional data and spend.

I6

* <AR>Automating consumer data pull (in progress, expect to finish by December) – Working with Sarath to automate media pull from Google platform directly and reduce the data pre-processing time for Marketing mix
* <BB>Transitioned several data processes to Prakhar for automation and ownership: NPP Grail, MMF, Grail QC.

I7

IX

* <AS>Design Digital Advertisement Simulation System (DASS) for modelling digital advertising and its impact on user behavior.

1. The simulation was used to test performance of multiple position-based attribution models, commonly used in the industry. Results showed that all attribution models failed to capture true causal value of advertising.
2. The simulation results were also used to compare performance of existing Marketing Mix Models (MMM). MMM estimates were within simulation’s confidence interval.

* <AS>Build a Search Engine Marketing (SEM) Performance model to determine CPC ceilings for different Paid Search campaigns (branded, unbranded, etc.) based on multiple ROI scenarios. These CPC values will be used in a pilot campaign for real time bidding for branded/ branded keywords and for Paid Search cost saving.
* <DF>Patient Support Program Launch Cost Benefit Studies: constructed a new baseline based on Merck’s financial claims forecast when there is no copay program in place to measure impact of proposed copay designs – for the Vericiguat Launch.
* <DF>Employee Development: Continue to work on developing procedures to expand the scope of marketing mix models and on improving the measurement of coupon utilization programs.

C1

* + <AR>Key: Marketing mix and Investment planning – Ran marketing mix models in collaboration with ZS to determine impact of digital promotions on Keytruda sales. Shared optimal investment scenarios for 2021.
  + <AR>G9: HCP and HCC Marketing mix (Adult & Adolescent) – Ran marketing mix models at DMA and Zip level for determining the impact of consumer and HCP Digital promotions for both G9 Adult & Adolescent
  + <AR>Belsomra and Pneumovax Consumer Analytics support – Calculated cost efficiency based on Net impact analysis from Crossix. Worked with INI, Crossix, media team, and brand team to provide investment recommendations for 2021 based on marketing mix and Crossix net impact analysis.
* <BB>Key: Twice a year, supplied and verified promotional data for multiple HCP channels/vendors and promotional spend for all HCP channels for marketing mix model analysis. Reviewed assumptions and model results with ZS and our team to determine best model structure.
* <BB>Key: To support request from AVP, conducted analysis of current KEYTRUDA reach and freq of HCP segments by channel to determine if and where additional spend could be placed and estimated revenue as result of that spend.
* <BB>Supported marketing mix analysis for at least ten brands sharing impact and ROI by vendor with brand teams to aid in 2021 resource planning and adhoc analysis. Support included promotion data and spend collection, input on brand strategy, presentation preparation and/or sharing of ROI results to brand teams.
* <BB>Partnered with ZS to perform impact analysis of personal and non-personal promotion pre-COVID compared to post-COVID to understand how impact per unit of promotion changed. Also, compared impact of various promotion types during COVID period to understand how performance of phone calls and online meetings compared to live rep calls. This will be beneficial to set expectations if another COVID shutdown period occurs.
* <AS>Evaluate promotion impact and channel ROI estimates of Lynparza's 2019 DTC campaign.

1. Calculated impact on sales and channel level ROIs of 2019 LYNPARZA DTC campaign with about $5M spend.
2. Assisted in justifying historical investments and determining if additional funds are needed for 2021 with launch of new indications.

* <DF>Marketing Mix Models: Pneumovax 23 (P23) MCM/MMF/HCP/HCC ROI Analysis: evaluated the sales impact of P23 HCP/HCC promotional programs for year ending Jan20 using marketing mix models for a total of ~$20MM investment.

C2

* + <AR>Gardasil DET measurements –
    - Presented G9 DET Wave 1 results to the leadership
    - Working on finalizing Wave 2 model results in collaboration with Vasu (expect to finish by Dec)
* <AS>Evaluate impact of 3 DIFICID DET HCP digital campaigns (Intent, Consideration and Fast Start) which were live from Oct'19 - Mar'20.

1. Calculated impact on total sales and channel level ROIs of 3 DIFICID DET HCP digital campaigns along with impact that could solely be attributed to DET activities.
2. Highlighted caveats in current segmentation used in DET campaigns and gave recommendations on how to approach DET campaign development and customer targeting.

C3

* + <AR>Key: Marketing mix and Investment planning – Ran marketing mix models in collaboration with ZS to determine impact of digital promotions on Keytruda sales. Shared optimal investment scenarios for 2021.
  + <AR>Investment Prioritization framework
    - <AR>Analyzed the impact of sample and vouchers for Januvia Family, Steglatro family, and Belsomra
    - <AR>Recommended allocation within/across business units (Primary Care &Women’s Health, Specialty) through scoring models and communicated the results to the BU leaders & Finance team

C4

* <DF>Consulting: approached customers to determine measurement opportunities for coupon utilization programs early in the year; instructed customers on new ways of measuring impact of copay programs. Worked w/sales operations and Finance to produce copay design studies.
* <DF>Coupon/Voucher Design Optimization – consulted on the following projects:
  + Analytic Roadmaps: constructed analytic roadmaps for the Diabetes, Insomnia, and HIV market which described the copay analytic services that MAIO could provide to the brand teams. Met with the Diabetes and Insomnia brand teams to go over the copay analytic plan for their brands.
  + Copay Design Tool: supervised and QCed the development of an Excel tool that will automate the production of copay design abandonment/adherence cost benefit studies.
  + Steglatro Family 2020 Quantity EV Copay Design – evaluated EV design based on quantity discounts (higher buydowns for 60-90 day scripts). Concluded that this design was not cost-effective.
  + Prevymis EV State Analysis: performed a cost-benefit study of expanding the Prevymis EV program to more states. Concluded that it was not cost effective to expand the program.
  + Gefapixant Benefit Study: forecast the estimated patient benefit (claims) from the Gefapixant launch based on commercial/Medicare patient forecasts, estimated copays, and abandonment/adherence rates (from IQVIA) for selected analogs.
  + IQVIA Abandonment/Adherence Study for the Congestive Heart Failure Market – helped developed requirements for an IQVIA cost-benefit study of proposed Vericiguat 2021 Copay and Denial Conversion programs. Supervised the analytic work and QCed the study results.
  + Vericiguat 2021 Patient Support Program Cost Benefit Study: performed a cost-benefit study of the proposed Coupon/EV/Denial Conversion programs to coincide with the Vericiguat launch in 2021. Incorporated findings from selected analogs and the IQVIA study. Recommended that the brand team launch all programs in early 2021 and to monitor the cost of these programs during the year.
  + IQVIA Abandonment/Adherence Study for 5 Markets – developed requirements for IQVIA study w/Senthil Murugan needed for optimal design of 2022 coupons. The study will provide utilization and abandonment/adherence metrics for brand teams (DPP4, SGLT2, HIV, Chronic Cough, and Congestive Heart Failure).

C5

* + <AR>Key: Net Impact analysis – Worked with Crossix & INI to calculate revenue and cost efficiency across different channels/publishers/vendors. Evaluated Crossix POC measurement methodology and suggested changes for accurate measurement
  + <AR>G9: Net Impact analysis – Worked with Crossix & INI to calculate cost efficiency at indication, channel, and publisher level
  + <AR>Belsomra and Pneumovax Consumer Analytics support – Calculated cost efficiency based on Net impact analysis from Crossix. Worked with INI, Crossix, media team, and brand team to provide investment recommendations for 2021 based on marketing mix and Crossix net impact analysis.
* <AS>Support Crossix 2019-2020 HCC media analysis for Diabetes, Nexplanon and Lynparza.

1. Supported multiple brand teams (Diabetes, Nexplanon and Lynparza) in estimating ROIs for DTC campaigns at granular level – publishers, audience segments, targeting tactics and multiple paid search campaigns with about $32MM spend.
2. Provided guidance to media and brand teams for 2021 DTC channel mix based on above ROI results.

C6

* + <AR>Key: Pilot launch and measurement support – Determined preferred geographies for running certain targeted campaigns (TNBC Social and Melanoma Display). Helped the Melanoma team measure the impact of 2019 Melanoma Display campaign in collaboration with Sarath
  + <AR>Key: Adhoc analysis –
    - TV business case – Helped the brand team to prepare a business case for relaunching TV
    - Impact of new media buying approach – Looked at early indicators of performance for new media buying pilot to provide recommendation for Lung & MB launch
    - MB impact projections – Projected revenue and NPS impact for $100M Masterbrand investment
    - MSI-H additional budget – Assessed the impact of additional investment on ROI
  + <AR>G9: Analyzed the correlation between revenue and awareness for G9 Adolescent
  + <AR>Analyzed contribution of WH Salesforce to G9 Adult sales and proposed steps to mitigate the impact of removing it
  + <AR>Supported the Januvia team with different LOE scenarios estimating change in return as the LOE approaches
  + <AR>Estimated the revenue impact of pausing FB for Q2’2020 and 2021 across Merck portfolio
  + <AR>Provided analytics support to the G9 NBE team for max touchpoints, calculation of CEI, and evaluation of modeling and UAT results
  + <AR>Gathered Adherence data and worked with Finance to get the 2021 NPV values
* <BB>Key: Supported KEYTRUDA ICE team and brand teams in allocation of $44MM HCP media, medical education and MMF budget for 2021 across indications, HCP promotion channels and vendors using Channel Investment Allocation model.
* <BB>Key: Participated in CIA working sessions with Customer Engagement Managers and presented ROI during brand team CIA meetings for each tumor family.
* <BB>Key: Provided Customer Engagement Managers analytical support regarding testing designs, adhoc impact analyses, interpretation of impactable revenue and ROI, optimal budget discussions, etc. including Banner impact analysis, NBE, Crossix HPC promo measurement and 81QD digital segmentation.
* <BB>Supported Datazymes consultant in impact and ROI analysis of 2019 MMF program attendance for 2021 IPF planning. Researched MMF data changes, as MMF vendor changed in 2020, resulting in new format and processing rules within new views.
* <BB>Participated in Agile HCP DnA Sprints to determine ideal, future state for channel, sub-channel and user action mappings of non-personal promotion. Collaborated to create category definitions which adhere to industry standards, where possible, and can be utilized holistically by Merck teams.
* <BB>Participated in “Run the Business” meetings to understand improvements, changes and data issues in non-personal data and communicate them to larger MA&IO team.
* <BB>Act as MA&IO point for HCP non-personal promotion channels and Grail views in CIRRUS.
* <AS>Support Nexplanon with their first TV campaign in 2021 with about $10M spend by creating multiple ROIs scenarios based on variations in campaign design.
* <DF>Vaccine/Specialty Promotion Response Curves (PRC): developed customer segment PRCs (year ending May20) for:
  + Gardasil (High/Low Meningitis Market, Nation)
  + Rotateq (High/Low Meningitis Market, High/Low Rotateq sales, Nation)
  + Pneumovax 23 (Clinics, Hospitals, Clinics/Hospitals)

C7

* <BB>Provided PNEUMOVAX\_23 brand team and DET with inputs needed to train NBE model launching in early 2021 including sales impacts by vendor and channel and maximum touchpoints by segment.

C8

* <BB>Partnered with ZS to perform impact analysis of personal and non-personal promotion pre-COVID compared to post-COVID to understand how impact per unit of promotion changed. Also, compared impact of various promotion types during COVID period to understand how performance of phone calls and online meetings compared to live rep calls. This will be beneficial to set expectations if another COVID shutdown period occurs.

CX

T1

T2

* + <AR>Investment Prioritization framework
    - <AR>Completed IPF for Januvia and Gardasil, and consulted Sarath & Tracie on Steglatro, Belsomra, Pneumovax, and Nexplanon. Held discussions with the individual brand teams to apprise them of the brand performance and suggested changes for 2021

T3

T4

* + <AR>Consulting Sarath on Pediatric vaccine marketing mix
* <BB>Partnered with ZS to perform impact analysis of personal and non-personal promotion pre-COVID compared to post-COVID to understand how impact per unit of promotion changed. Also, compared impact of various promotion types during COVID period to understand how performance of phone calls and online meetings compared to live rep calls. This will be beneficial to set expectations if another COVID shutdown period occurs.
* <BB>Managed relationship between Promotion Optimization team and Datazymes’ contractors including invoicing, hardware, systems access and project assignment.
* <BB>Supervised multiple analytical projects completed by Prakhar Mundra and mentioned in above achievements under Innovation & Core Services.

T5

* + <AR>Intern management – Managed intern onboarding, and provided guidance on building a deep learning model to estimate the impact of promotion sequencing on physician prescribing behavior
  + <DF>2020 Graduate Interns: recruited, hired, trained and helped supervise two graduate interns in summer of 2020. The interns worked on developing machine and deep learning models for market mix analyses, promotion response curve estimation, and optimizing next best engagements.
  + <DF>2021 Graduate Intern: recruiting graduate interns for summer of 2021.
  + <DF>MA&IO Graduate Intern Program: supervised MA&IO graduate intern program. Worked with Mike DeFazio to implement and manage MA&IO intern recruitment.

T6

TX

* + <AR>Key / G9: Collaborated with stakeholders (brand/media/INI/Crossix team) on a day-to-day basis to share analytics POV in decision making
  + <BB>Supported Datazymes consultant in impact and ROI analysis of 2019 MMF program attendance for 2021 IPF planning. Researched MMF data changes, as MMF vendor changed in 2020, resulting in new format and processing rules within new views.