



Capturing Promotion Response

*How Panel Analysis can improve
the accuracy of Predictive Analysis*



KMK Consulting, Inc.

Your Integrated Commercial Operations Partner

Introduction

Optimizing Predictive Analytics For Improved Commercialization

Businesses are thirsty for a competitive edge. Harnessing the power of predictive analytics in bringing medicines to market can provide valuable insights to drive that advantage, and when put into practice, can have far reaching implications to the future of life sciences. Predictive analytics in the life sciences industry has long struggled to cope with the challenges of identifying and decoding the complexity of human behavior and its changes over time; however, if used correctly today, it can help optimize commercialization with planning, production, and distribution.

The basis of a valuable predictive analysis lies in its handling of seemingly “unexplainable” events – events whose impact on the desired response is difficult to estimate and extract. For example, when trying to estimate the impact of field calls on product sales, it is important to understand and extract the impact of unexplainable environmental factors such as political events, market trends, seasonal trends, etc. away from the desired impact of field calls. In order to discover the true patterns of such underlying opportunities as Rx trend or behavior, one must remove or minimize as much as possible the impact these unexplainable events have on the analysis, keeping in mind the primary measurement of success for predictive analytics is *how well it reflects reality*.

From a life sciences commercialization perspective, promotion response has been a chronic victim of these persistent unexplainable events inadvertently influencing the desired response. Proper modeling with panel analysis can largely alleviate any undesired impact and yield a more accurate promotion response.

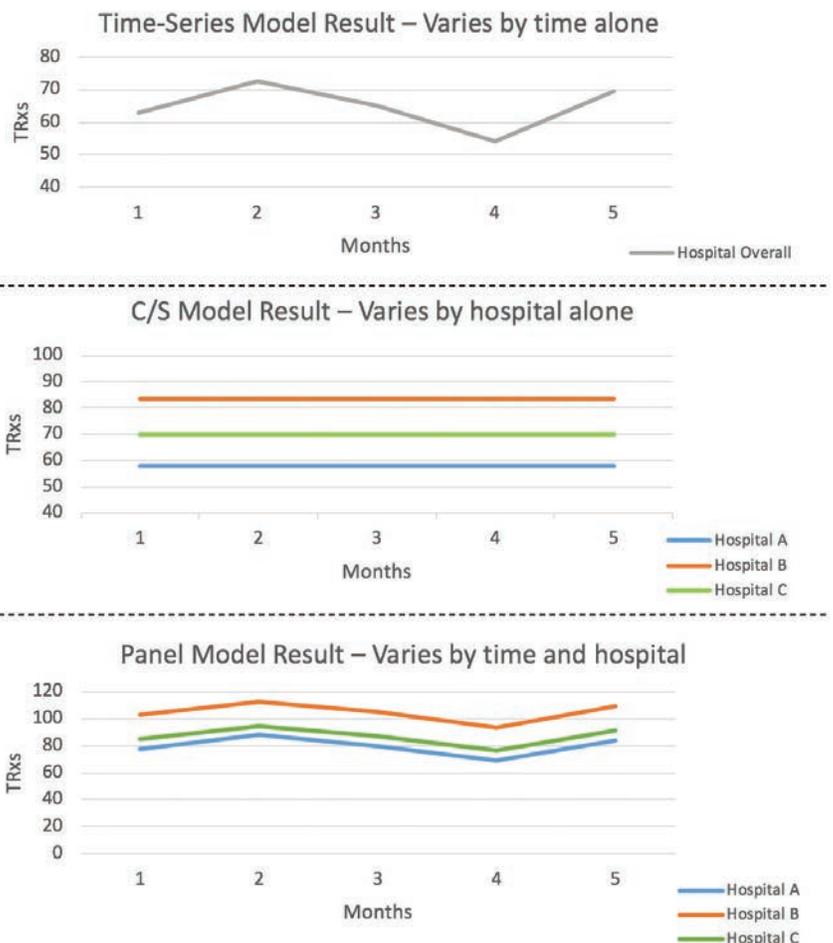


Why Do We Need Panel Analysis?

Panel analysis is a statistical modeling technique that is designed to measure individual entities' (e.g. HCPs) responses over time. Unlike more traditional analysis techniques, such as time-series and cross-sectional analysis where input is a single level (e.g. either across physicians or across time periods) and output is a single value response (see figure 1), panel analysis provides the functionality to account for additional factors and capture response by individuals and over time. This means that panel analysis can capture variability at the individual physician level, i.e. each individual's unique baseline response, in addition to providing results at the national level. In fact, with enough good quality data, panel analysis may even be capable of providing individualized promotion response results beyond the baseline. Leveraging these individualized results can bring the industry closer to personalized promotion in the commercial space, a goal that has thus far seemed too distant to reach.

Further augmenting its capabilities, panel analysis is able to capture not only variances in response across individuals, but also variances in response over time. In doing so it more accurately depicts the baseline to provide greater precision in predicting behavior. Not only do these accurate responses drive better overall estimation of outcome, allowing companies to allocate resources optimally and avoid over- or under-spending on promotion, they have many potential downstream impacts. The use of panel analysis can greatly impact sales operations in its applications in forecasting, launch strategy, formulary impact, marketing mix and more.

Figure 1: Time-series, Cross-sectional and Panel Analysis models – A Comparison



Sample data on three hospitals over five months has been used to run three distinct models:

1. Time-series
2. Cross-sectional (C/S)
3. Panel

The charts depict the results of each model:

- The time-series model is unable to capture variances across hospitals
- The cross sectional model is unable to capture variances over time
- The panel model is able to capture variances, both across hospitals and over time

How Does Panel Analysis Address Current Challenges With Predicting Promotion Response?

The advantage of using panel analysis is that it does not suffer from the two major challenges posed by conventional industry approaches to promotion response:

CHALLENGE 1: *HCP prescribing often exhibits time trends and seasonal patterns independent of promotion activities.*

Panel analysis works by extracting the effect of time while looking for true responses to promotion. As a result, it is able to more accurately attribute HCP prescribing to its individual contributors, be it trend, seasonality, or promotion activity.

CASE STUDY 1: *Panel analysis handles seasonality and other calendar related inconsistencies.*

Product L is a sleep aid medication. The field force responsible for Product L reported numerous cases of successful HCP conversions after detailing, yet results of a traditional response analysis yielded an almost negative response from a few tiers of field targets. On closer examination of the market data, seasonality was observed with peak volume during summertime and lowest volume in winter. Moreover, product L was impacted by formulary changes at the beginning of the year, which further complicated the analysis.

By placing product L in the panel analysis model, the time impact was clearly separated from the rest of the product prescription behavior, particularly when longer term data was not available.

After applying the panel approach for the response analysis, Product L saw a much stronger correlation between field promotion and HCP prescription, delivering a conclusion in line with field observations. Panel modeling greatly improved the visibility of all events influencing promotion response and enabled true business insight optimization.

CHALLENGE 2: *Traditional approaches assume that all HCPs with similar historical Rx volume will have the same baseline response.*

Panel analysis rejects this premise, and rather takes into account that every HCP is an individual and will react differently to the same marketing activity. Therefore, it looks for each individual's unique response to promotion. This is a more data-driven approach using the data to point to the HCPs who best respond to promotion, rather than using inherent assumptions about physician volume to drive the analysis.

CASE STUDY 2: *Panel analysis estimates each individual's unique baseline response.*

Company C wishes to test out the effects of a promotion on a wide range of HCPs in all specialties and geographies. Past analyses involved segmenting the HCPs by decile groups and yielding an individual result for each group. This approach assumes that physicians with similar historical volume will share a common baseline response, resulting in a single baseline response for each decile group. Panel analysis is able to tease out the individual variability in baseline response for each physician, thereby more accurately extracting the impact of promotion in each group.

On closer examination, significant variability can be observed in response to field promotion, even within each decile group – unobservable from the results of the traditional approach. Simply put, there is no viable justification for the assumption that HCPs of the same decile should behave similarly to field promotion.

The company may only be looking to understand response for different types of HCPs, but with enough data and using panel analysis, the capability exists to drill down and obtain an individual response for each and every HCP. This not only fortifies the promotion response analysis, but also has far reaching implications for sales force sizing, alignment, targeting, and call planning. By applying panel analysis, company C can obtain far greater insights than they might originally anticipate, and a vast pool of individualized information about their HCPs.





Conclusion

Panel analysis has brought the life sciences industry a means of better identifying promotional response in the individual as well as in aggregate, ultimately resulting in optimized promotion. With its two- (or more) dimensional nature, panel analysis has the ability to capture individual differences along with how these differences change over time, thereby providing a path toward a more impactful strategy. This ability to provide more precision when using predictive analytics, particularly when studying promotion response, makes it a valuable tool in the analyst's toolbox. Further, it has the potential for delivering significant downstream impact, such as improvement in sales force sizing, targeting, call planning, and several other applications in the realm of life sciences.

The Authors



About Ning Jia

Ning is Associate Principal at KMK Consulting Inc., leading KMK's Analytics Division and acting as Head Consultant on customer projects. Ning has spent the past 10 years supporting and leading analytical and operational engagements with various types of clients in the life science industry.

She provides in-depth experience in full-spectrum sales force effectiveness, marketing science, and advanced brand analytics, as well as commercial analytics and reporting. Ning earned double Master's Degrees from Lehigh University in Statistics and Electrical Engineering.



About Bo Zhang

Bo is a Manager at KMK Consulting Inc., working within the Analytics Division. He has an educational background in quantitative analytics and holds a Master's Degree in Operations Research from Cornell University. Bo has spent the last eight years focusing on commercial strategies and analytics for pharmaceutical and bio-sciences companies. His areas of expertise include: sales force optimization, sizing and alignment, short-term and long-term forecasting, CRM, incentives, brand analytics and reporting.



About Aakash Divanji

Aakash is an analyst primarily focused on advanced analytics efforts within KMK's Analytics Division. Since graduating from Cornell University in 2015, he has concentrated on the areas of marketing science and sales force optimization in the life sciences industry. He has spent the last three years developing expertise in promotion response modeling, sales force sizing, short-term forecasting and incentive compensation. Aakash has a Master's Degree in Engineering Management from Cornell University and a Bachelor's Degree in Computer Science from the University of Mumbai

KMK Consulting, Inc.

KMK Consulting, Inc. is a full-service consulting firm specializing in commercial operations support to the life science industry. Since our inception in 2000, KMK has grown to have more than 120 full-time employees, providing analytical support to clients on-site, as a project, or as SaaS that helps drive business decisions and improve the efficiency and effectiveness of commercial analytics and sales operations. We eliminate complexities for commercialization leaders by integrating:

- Accurate Marketing and Sales Analytics
- Sales Ops Software
- Market Research
- RWE/Health Economic & Outcome Research



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