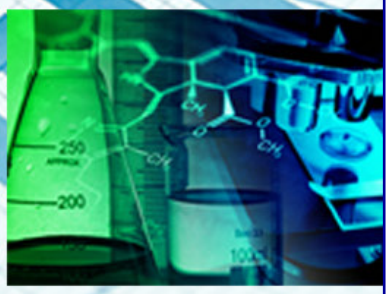
JPMSA

JOURNAL OF THE PHARMACEUTICAL MANAGEMENT SCIENCE ASSOCIATION



Pmsa
PHARMACEUTICAL MANAGEMENT SCIENCE ASSOCIATION

SPRING 2013

Welcome to the Inaugural Edition of the Journal of the Pharmaceutical Management Science Association

Margaret Seaman, PMSA President and Associate Director of Business Statistics, Salix Pharmaceuticals

The Pharmaceutical Management Science Association (PMSA) is pleased to announce the first edition of the Journal of the PMSA! The Journal is the official research publication of PMSA. Its purpose is to promote and embody the mission of the association. In particular, the journal aims to help meet the following goals:

- Raise awareness and promote use of Management Science in the pharmaceutical industry
- Foster sharing of ideas, challenges, and learning to increase overall level of knowledge and skill in this area

The Journal publishes manuscripts that advance knowledge across a wide range of practical issues in the application of analytic techniques to solve Pharmaceutical Management Science problems, and that support the professional growth of PMSA members. Twice per year, the Journal of the PMSA publishes a wide range of peer-reviewed practice papers, research articles and professional briefings written by industry experts and academics. Articles focus on issues of key importance to pharmaceutical management science practitioners.

Thank you to Journal Editor David Purdie for his hard work in launching our initial issue. If you are interested in submitting content for future issues of the Journal, please send your submissions to David Purdie at dpurdie@pmsa.net.

Guidelines for Authors

Summary of manuscript structure: An abstract should be included, comprising approximately 150 words. Six key words are also required.

All articles and papers should be accompanied by a short (about 100 words) description of the author(s) and, if appropriate, the organization of which he or she is a member.

Industry submissions: For practitioners working in the pharmaceutical industry, and the consultants and other supporting professionals working with them, the Journal offers the opportunity to publish leading-edge thinking to a targeted and relevant audience.

Industry submissions should represent the work of the practical application of management science methods or techniques to solving a specific pharmaceutical

marketing analytic problem. Preference will be given to papers presenting original data (qualitative or quantitative), case studies and examples. Submissions that are overtly promotional are discouraged and will not be accepted.

Industry submissions should aim for a length of 3000-5000 words and should be written in a 3rd person, objective style. They should be referenced to reflect the prior work on which the paper is based. References should be presented in Vancouver format.

Academic submissions: For academics studying the domains of management science in the pharmaceutical industry, the journal offers an opportunity for early publication of research that is unlikely to conflict with later publication in higher-rated academic journals.

Academic submissions should represent original empirical research or critical reviews of prior work that are relevant to the pharmaceutical management science industry. Academic papers are expected to balance theoretical foundations and rigor with relevance to a non-academic readership. Submissions that are not original or that are not relevant to the industry are discouraged and will not be accepted.

Academic submissions should aim for a length of 3000-5000 words and should be written in a 3rd person, objective style. They should be referenced to reflect the prior work on which the paper is based. References should be presented in Vancouver format.

Expert Opinion Submissions: For experts working in the Pharmaceutical Management Science area, the journal offers the opportunity to publish expert opinions to a relevant audience.

Expert opinion submissions should represent original thinking in the areas of marketing and strategic management as it relates to the pharmaceutical industry. Expert opinions could constitute a review of different methods or data sources, or a discussion of relevant advances in the industry.

Expert opinion submissions should aim for a length of 2000-3000 words and should be written in a 3rd person, objective style. Whilst references are not essential for expert opinion submissions, they are encouraged and should be presented in Vancouver format.

Industry, academic and expert opinion authors are invited to contact the editor directly if they wish to clarify the relevance of their submission to the journal or seek guidance regarding content before submission. In addition, academic or industry authors who wish to cooperate with other authors are welcome to contact the editor who may be able to facilitate useful introductions.

Table of Contents

The Changing Landscape is Calling for a Revamping of Our Toolbox – What Are We To Do?

Jean Patrick Tsang, PhD and MBA (INSEAD), President of Bayser, bayser@bayser.com

Abstract

Our industry is undergoing dramatic changes and three dynamics are leading the charge. First, healthcare reform has set in motion deep structural changes that will continue to unfurl, especially with the architect of the reform at the helm for another term. Second, information technology has moved even further into the fabric of our everyday life. Electronic Medical Records (EMRs) are replacing paper, with far-reaching implications regarding both how business is conducted and how business is analyzed. Parenthetically, EMR's are allowing us to become closer to evidence-based and personalized medicine. Third, Specialty Pharma has risen as the newfound savior that will deliver us from the gallows as Traditional Pharma marches over the patent cliff. The promise of Specialty Pharma is so alluring – almost reminiscent of the gold rush – that countless companies have undergone entire reorganizations to be better poised to stock their specialty portfolio, to the consternation of incumbents, employers, and insurance companies. Yet, despite this shifting backdrop, our analytical toolbox (both data and methodologies) has remained largely unchanged. In this paper, we advocate for two changes to redress the situation. First, the toolbox needs a long overdue upgrade. Second, a radical shift in mindset is in order. This is all the more needed since the current mindset failed to recognize the gross shortcomings of the current toolbox and the risks it spells. Once those two changes are embraced, we will have cleared the way to position ourselves as the neo-cortex of the company.

The ground is shifting and we are completely absorbed in providing answers to good old questions. We are missing in action regarding new questions the industry is posing, such as: What opportunities does the Patient Protection and Affordable Care Act (PPACA) open up for our drugs? While this is an incredibly crucial question, it invariably gets shrugged off as if it were too ethereal to be taken seriously. And that's even the case when our leadership has a good grasp of PPACA. How can that be? To understand what's going on, one needs to look inside our toolbox. The toolbox, as you'd expect, is stocked with all kinds of advanced techniques. Closer scrutiny, however, reveals that each tool is meant to tackle a well-defined and specific problem. Interestingly, when the problem is broad and encompasses several moving parts, there is simply no tool for the job. That's why our question is flatly dismissed (no tool in the toolbox for that problem). That's why the PPACA question is perceived as too general and needs to be whittled down before any answer is attempted.

This state of affairs is unfortunate since tremendous progress has been made over the last decades. There is a whole body of knowledge around System Dynamics (SD) that allows us to explore how a system evolves as a result of interactions among its components. While SD is by no means the panacea, it may provide valuable insights regarding how physicians, hospitals, and IDN's (Integrated Delivery Networks) respond to the upcoming rise in healthcare demand as the 32 or so million new people gain access to insurance coverage. SD may also help us catch a glimpse of subtle ripple effects such as unintended consequences of our interventions.

At the other end of the spectrum sits Agent-based modeling (ABM) which is to SD what micro-economics is to macro-economics. ABM is relatively new and is an outgrowth of object-oriented languages where an object is elevated to the status of an agent and can interact with other agents in its own rights. An agent in our world is a physician, patient, or sales representative, and an ABM model can help capture the workings of a group practice where physicians see patients and interact with other physicians, while patients and sales representatives wait in the waiting room to see physicians. The value of such an approach is that it allows emergent behaviors to be analyzed. By emergent behavior, we mean the behavior of an entity that is qualitatively different from that of the individuals it comprises. An analogy may help clarify this. Consider a single neuron. What the neuron does in essence is very basic: take a weighted sum of the inputs coming along its dendrites and, when the combined signal is strong enough, transmit a signal down its axon to the neuron downstream. We all agree this can hardly be described as intelligent, and yet, put 100 billion of those together and you have consciousness, intention, and free will. Put millions of those together and you have religion, the internet, and society. Just the same, by capturing thousands of patients and hundreds of physicians in the model, ABM allows us to gain a holistic understanding of group practices and patient bases, and how those two groups behave, interact, and influence each other.

There is a third related construct, Dynamical Systems (DS), which is at our disposal whenever the question veers towards the behavior of the system itself: Will the system converge to a certain state, and if so how fast will it diverge from the current state, or oscillate back and forth between states? Answers to such questions can be very illuminating whenever we contemplate long-term strategies, whose success, we all know, largely hinges upon the accuracy of the assumptions we make regarding how the healthcare system will operate 5 to 10 years from now. One interesting thing to note about DS is that while it may sound obscure, the phenomena it gives rise to are not. Who has not heard of the butterfly effect of chaos theory or seen colorful pictures of mesmerizing fractals? Parenthetically, DS spawned interesting philosophical debates, namely, around the puzzling fact that a system can be deterministic, and yet be utterly unpredictable. From the prey-predator world we came to realize that under certain conditions, it is virtually impossible to predict how many rabbits (prey) and foxes (predator) there will be at the next time period even when we know perfectly what their populations were in the past, no matter how far back we look.

Let's consider another important question that all pharmaceutical companies are asking: Should we contract with a specific payer to improve formulary access to our drug and, if so, how much is that worth? This question is not new although it may seem that way given the manpower now dedicated to managed care. The way this question is addressed is understandably shrouded in secrecy given its central role in the company's finances. Unfortunately, that has two perverse effects. First, the decision-making process is shielded from conversations with the outside world (the small group of people representing the payer do not really count as outsiders) so the odds that new ideas will break in are very slim. The thought process, along with the underlying assumptions, is rarely unpacked in front of a group of peers for critical review and suggestions for

improvement. Second, it is always specific instances of the problem that are addressed, not the larger problem. Indeed, the task at hand is about just one drug for one payer in one geographic market, which means the problem is solved all over again each time. Unlike Sisyphus, no one seems to be concerned. More troubling is the fact that the opportunity to realize deeper truths about how business should be conducted is repeatedly missed, but that has not come across as disturbing. Instead, the prevailing mantra merrily points in the other direction: "When you've seen one payer, you've seen one payer."

What's cruelly missing in the toolbox is a set of tools that pertain to reasoning by analogy. In case-based reasoning (CBR), for instance, one starts off with a large database of cases (e.g., legal cases, life situations, chessboard configurations) from which a handful of cases is retrieved based on the similarity they present to the situation at hand. Those cherry-picked cases then play a determining role in the crafting of a solution. At the heart of the retrieval task is pattern matching, which ratchets plain-vanilla matching up a few notches. Instead of attempting to match two attributes (one from the problem at hand and the other from the candidate case to pull up), it seeks to match an abstraction of the two attributes. The tricky part of course is recognizing which abstraction to focus on. Just as an example, in the case of criminal trials, the fact that the presumed murderer does drugs and has a checkered record would suggest that we look into cases where the offender presents a similar profile. By contrast, the name of the presumed offender does not matter (or else, that would mean our judicial system is heavily compromised) and cases should not be sought just because the analogue offender shares the same first name as our presumed offender.

Here is how we would operate if we were to use reasoning by analogy to shed light on the contracting question. We'll start off by building a very large database where each record captures how sales of a drug relative to a payer change, if at all, as a result of a shift in the formulary of that payer. A pre-post pair-wise test-control approach along with some additional precautions would ensure that the reported change in sales is truly due to the shift in formulary, not to some extraneous factors. Similarly, no associated change in sales would be as informative as a change in sales since that would mean there is no point in contracting with that payer. Regarding the scope of the database, there is no restriction as to what goes in. In theory, the database can encompass any drug, any payer, any change in formulary, and any geographic market, over whatever time frame we see fit.

Once built, this database is a real treasure trove. Not only does it illuminate whether contracting with a particular payer is a good idea or not, it also sheds light on the terms of the deal we should seek. The greatest hurdle to clear for one payer may be the Prior Authorization currently in place, whereas for another, it may be the stinging co-pay that prompts the patient to think twice before filling the prescription. The reason why such insights is possible is the database allows us to compare the impact of formulary shifts on the physician side (e.g., Prior Authorization, Step Therapy) with its counterpart on the patient side (e.g., co-pay amount). Also, a dollar value may now be placed on being first to break free from other drugs and acquire preferred status or on catching up shortly after the competition has made a formulary move. The database allows all sorts of comparisons: value of contracting over time, across payers, across therapeutic areas, across geographic markets, and

also enables us to answer a whole host of pointed questions. The best part is all those findings are anchored in real data, not in someone's opinions.

Let's now move on to a third question the industry is asking: What is the market share of our drug? Anyone with rudimentary skills in database manipulation and a modicum of knowledge of the therapeutic area is fit for the job. Indeed, sum up the Rx's of our drug, sum up the Rx's of the market, divide one by the other, and voila. This is absolutely correct, so long as we are looking at an oral drug that competes in a market of orals. One of the legacies of our industry is we have great data that allows an almost perfect read on the Rx activity of oral drugs. What if we are looking at a biologic instead? The plot indeed thickens.

First off, we hire Specialty Pharmacies (SP) to distribute our drug, which means that we use their data to track sales of our drug. Unlike data for orals, the data feed we receive from SP's pertains only to our drug, not to the competition, except in rare cases. This means the SP data sources alone are not sufficient. Thus, we need other databases. Our ex-factory data can certainly help identify holes in the SP data although they are mute regarding competitive activity and do not contain any information on indication, which becomes an issue as soon as our drug has multiple indications. The next place to look is claims data, a.k.a., patient–level data (PLD). Right off the bat, PLD comes in two flavors: closed and open, so which one will it be? The closed data sources are not subject to leakage, which means absence of a transaction in the data (an Rx fill) can, for all practical purposes, be taken to mean absence of the transaction in actuality. This feature is key if we have to deal with lines of therapy, adherence, and the like. Open data sources, on the other hand, are much broader in scope as they collect data from different points in the healthcare system. Unlike closed data sources, they cover a wide array of payers but are subject to leakage. So, the short answer is both types of databases are needed, which in turn triggers the question: Which ones, and how should they be used in combination?

Second, say, as is often the case, that our biologic competes in a market that also includes orals or subcutaneous injections (subq's). This detail just made tracking of the market share much harder. Some background will elucidate this. Injections are tracked through J-codes and are documented in CMS-1500 claims that are filed by the physician or nurse to get reimbursed by the payer for services rendered. Orals, on the other hand, are dispensed in the pharmacy and generate Rx claims. As for Subq's, they can go either the CMS-1500 or the Rx route, depending on the subq in question. Now the capture rate of the drug, which represents the percentage of all transactions that are indeed reported in the data, is highly dependent on the channel through which it is tracked: CMS-1500 or Rx. This means we need to know the capture rates of the two channels, or at least, their relative magnitudes, to be able to estimate the market share. Consider, for example, that the injection volume is 100 units and the Rx volume is also 100 units. Say the capture rate of the injections is 40% and that of the oral/subq Rx's is 80%. In that case, injections represent not 50% of the market but rather 67% since there are 250 units of injections (100 ÷ 40% = 250) and 125 units of oral/sub1 (100 ÷ 80% = 125).

Third, say in a specific market, drug A is taken every month while drug B every

two months. Unless special precautions are taken, a straightforward measurement of market share will under-report usage of drug B by 50% since half of the patients will not have taken drug B that month. In the same vein, one needs to recognize that some drugs are taken alone (mono-therapy) while others in combination with other drugs (combination therapy), which may lead us to define market shares in excess of 100%. Also, for some markets, the market share question only makes sense for a given line of therapy, which means that business rules need to be articulated and tested before a meaningful market share number can be reported.

The take-home here is that a question as familiar-looking as market share can quickly take us to unknown territory, especially when move away from orals. This can be a rude awakening for those who have only dealt with the oral world in the past. To that end, two tools need to be added to the toolbox: (1) a solid grasp of commercially available databases, and (2) good mastery of projection techniques that involve combining several databases.

Let's now turn to the fourth and last question, arguably the hottest question in information gathering. Given the nature of our business, we constantly need to understand the position of patients and physicians vis-à-vis disease and treatment. That's why we conduct, as is our tradition, countless ATU's (attitude, trial, and usage), focus groups, one-on-one's, ethnographic studies, and a whole host of other activities. In the meantime, the computer revolution has ushered us into a new era and opened up new data sources, two of which are worth noting. First, patients and caretakers are flocking to the web and putting out a mind-boggling 90 thousand pieces of health-related postings every single day, according to Nielsen BuzzMetrics (http://publichealthpractice.org/sites/default/files/forum/13981/jonathanhandout-3.pdf). Second, EMR's, which are replacing paper dossiers, are capturing a growing body of information in free-form text that, for instance, explains directly why the physician is dropping a therapy, changing dosing, or trying out a new one. This is, of course, in addition to patient demographics, diagnoses, procedures, lab tests and results, and the like.

EMR data sources are a real boon. For one, they are not subject to the Hawthorne effect which, we all know, coaxes us to color our answer to please the person asking the question. That's why, for instance, our surveys often predict an overwhelmingly high proportion of physicians that will prescribe our drug when relatively few actually do. For another, EMR data sources talk about what matters to patients and physicians, not what we think matters to them. Blinders we unwittingly put on are simply not there. And yet we shun these data sources. How is that possible? Is that because they do not come in neat packages and do not readily fit in the artificial structure of our relational databases? This situation is as nonsensical as a farmer who would drive away from his acres of potatoes to buy French fries just because he does not have a potato peeler at home!

Looking back, we did not always know how to mine databases to answer business questions and yet today we have SQL Servers, SAS code, and Excel macros pat down for the job. Just the same, analysis of electronic postings looks frightening today because we have not delved into linguistics and natural language processing much before, but in a not-so-distant future, it will count as one of our core competences. We need to get started on how to analyze electronic postings. Our farmer needs that potato peeler.

At this point, let's quickly recap what we have achieved so far. We went through four very different problems, exposed the shortcomings of our analytical toolbox, and described what tools need to be acquired. How is it possible, you may wonder, that we have not been awakened to the fact that our toolbox has become so antiquated? The answer is actually very clear: It's our mindset. Indeed, it is not in our nature to seek out problems and, as a result, we do not get stumped, which robs us of the realization that our toolbox needs replenishing. But those problems should have sought us, one way or another, through those that face them. And they did not, which can only mean it is not believed that we can provide adequate solutions to those problems. But why would such a belief take hold? It dawned on me it's because those who saw the problems and did not summon our help have been repeatedly exposed to situations where they were presented information but had to connect the dots themselves. In other words, they were left to their own devices to craft the story. To put it bluntly, we are perceived as poor story crafters.

Before we move on with suggestions on how to redress the situation, a quick discussion on the importance of the story is in order. Indeed, why would a story be so important? Like all living beings, our default setting is not to waste energy, so we only spring into action if it is to avoid pain or register gain. Our evolutionary past has taught us that an immediate gain can lead to a big pain (eating poisonous mushrooms may lead to severe stomach pains or even death) and that an immediate pain can lead to a big gain (beat the alpha male and enjoy the privileges of the displaced leader). So for a call into action to work, it cannot simply conjure up pain or gain, it has to convey the fact that the gain will not be followed by a pain (not a trap) or that the pain really leads to a gain (worthwhile sacrifice). In other words, it has some explaining to do. As our language skills developed, this thought took the form of a narrative, which given our wiring for oral communication, became a story. Its role remains unchanged: ensure protection of the one that is about to carry out the plan by having that person check the credibility of the story first before springing into action. If for some reason the plan comes across as fishy (unclear that the gain is commensurate with the pain), abort and save energy; otherwise, forge ahead with the plan. By the way, that's why you never fail to demand an explanation when asked to perform a task that requires a fair amount of energy on your part. As you have guessed, the boardroom is no different from the savannah: We all need a good, credible story prior to making a decision (see sidebar on "What makes a good story?").

It is highly desirable indeed to be involved in story crafting since stories are ultimately the engine of company decisions. What's more, many privileges come with story crafting among which is a panoramic view of the company and access to otherwise off-limits meetings. The good news is we are not starting from scratch. Although we are not crafting the story, we currently interact, albeit infrequently and indirectly, with those who do and we routinely provide key ingredients such as analyses and data cuts that go into the story crafting process. The other good thing is those tasked with crafting stories will seek out those they believe can truly help. In the meantime, here are three things we can do to get closer to the action:

- **Open up our vision of the world.** Seek out problems that are keeping the head honchos up at night and understand why that is. If someone else builds a better story than we do, it's because that person is factoring in information we do not have access to, so we need to seek out information further than where we usually go.

- **Understand what the objections are and bake them into the story.** Many of those objections come from key people in the organization. Find out who those people are and understand their viewpoints. Then, making sure the objections are deftly addressed won't be such a big deal.

- **Expand the bandwidth of our interactions** at information delivery meetings by adding a section that looks at the implications of the findings and ties them back to the larger picture. In other words, start introducing stories in our interactions.

Make no mistake, story crafting is very difficult. Just because the story is short does not mean the process that gets us there is. Pascal taught us that a long time ago when he famously said "If I had more time, I would have written a shorter letter." Indeed, story crafting comes across to most of us as formidable because it requires great synthetic skills that may not come naturally to us, namely, the ability to sift through and process humongous amounts of information of different kinds, and an acute sense of perspective that allows us to always tell apart the trees from the woods.

As we open up our world, we'll get better at story crafting which in turn will broaden our view of the world (virtuous cycle). It won't take long for us to see the pile of urgent problems that need attending to and realize that our toolbox is not up to snuff. Alternatively, we could stick to our knitting and enjoy the comfort of the familiar. Which one is it going to be?

About the Author

Jean-Patrick Tsang is the Founder and President of Bayser, a consulting firm based in Chicago. JP is a big fan of PMSA and felt bad he missed last year's conference. JP is an expert in patient-level data and targeting, and teaches classes on specialty pharma and the healthcare reform. In a prior life, JP was a researcher in Artificial Intelligence, worked on payloads for satellites, and advised a couple of PhD students. JP has a PhD and an MBA from INSEAD.

What Makes a Good Story

Of course, we are not referring to bed-time stories for children, biblical parables, or Aesop's fables. The story we are referring to here is a short narrative that is prescriptive in nature and offers a clear course of action for the situation at hand. A compelling story, which is what we are striving for, invariably shares the following features:

- **Relevant** – The story has to bear direct relevance to the situation at hand. As we all know, a theorem, however clever, is useless if its requisite conditions are not fulfilled. The problem to watch out for here is not irrelevant stories (those are quickly discarded) but rather stories that present only partial relevance. The fact that key attributes of the situation have been left out may not be obvious.

- **Credible** – The story must make immediate sense and stand up to common objections. It's even better when it is anchored in data and analyses and underscores the causal relationship that ties the suggested course of action with the attainment of the goal. Better still is when the story offers a crisp explanation as to why alternative courses of action would fail.

- **Short** – The story has to be short for three reasons. First, it is meant to be communicated orally and as such should not exceed the attention span and short-term memory capacity of the recipient. Second, the odds the story gets distorted grows significantly as the story gets longer. Third, the emotional trigger, which is key in mustering passion and excitement of the recipient, quickly wears off with time.

All stories are subject to the law of unintended consequences. For that reason, a story will gain wider support if its narrative shows it is impervious to top-of-mind unintended consequences. An illustration is in order. In the world of biologics, buy-and-bill reimbursement is common practice. The physician purchases the drug at a given price, charges the payer at a higher rate, and pockets the difference. In an effort to help the patient, pharma companies would from time to time pick up the tab and have the drug delivered pre-paid to the physician office. This laudable gesture, however, angers the physician. But why? That's because the physician can no longer collect a spread. Indeed, one cannot charge for something that's free. What's more, it still behooves the physician to store and handle the drug just the same. The unintended consequence of delivering pre-paid drugs at the physician office – a practice known as white bagging – is physician alienation despite the good intention. While this may be obvious after the fact, it certainly was not for the many pharma companies that went down that route.

Example from everyday life: "To lose weight, one should exercise, not follow diets. Here's why: Everyone that follows a diet ends up gaining the lost weight and puts on additional pounds. That's because our evolutionary heritage has endowed us with a reflex that is set off as soon as the body is starved. Our body is directed to accumulate energy (read fat) at the first opportunity and accumulate additional reserves (read even more fat) to weather subsequent famines."

This story is relevant if you want to lose weight, credible (invokes some evolutionary biology explanations) and takes less than 30 seconds to tell.

Optimizing Sales and Marketing Operations Using Potential Scores

Kevin Kirby, Michael Allen Company, kkirby@michaelallencompany.com

Abstract

A brand's success is driven by many different external (exogenous) factors and internal (endogenous) factors such as sales and marketing efforts. To understand the influence of the internal factors and to optimize these "controllable" factors, organizations must first thoroughly understand how the exogenous factors drive brand performance. Once these external factors are accounted for, a customer-level potential score can then be developed and used to optimize the commercialization processes. This article discusses how to optimize sales and marketing operations by uncovering the true drivers of brand potential, creating a potential score, and incorporating it into business processes. A case study is shown where an organization, prompted by complaints that the incentive compensation system was unfair, used potential scores in promotion response, targeting, call planning, territory alignment, and incentive compensation to improve commercial execution and re-motivate sales representatives.

Commercialization Process

When commercializing pharmaceutical and biotech products, many moving parts must be well integrated in order to extract the most benefit in the short window of brand exclusivity. But shortcomings in the marketing and sales operations processes often limit brand success. When the commercialization process has problems, not only does the immediate brand success suffer, but the effects can ripple through the organization and have long-lasting de-motivational effects. In the case study used in this article, the organization's management was dealing with complaints that the incentive compensation system was unfair to certain representatives – particularly those in areas with unfavorable manage care plans. The incentive compensation issue needed to be fixed, but it also signified shortcomings within territory alignment, targeting, call planning, forecasting, and the brand strategy itself.

Although most organizations have a good conceptual idea of what drives their brand sales, they often lack robust metrics for these factors and do not recognize how they interact to drive success. It is critical to discern what truly drives brand success and to take explicit steps to incorporate these drivers into the operation.

Understanding Drivers of Brand Potential

For the key commercialization processes, it is essential to identify the drivers of brand success. Without knowing these drivers and how they impact brand success, it is impossible to optimize the sales and marketing levers.

The crux of this step is to create a robust statistical model that explains variation in brand sales volume across customers as a function of all other exogenous factors. These factors should be independent

of prior or current brand success. For example, sales volumes of competitive products are true exogenous factors, but prior sales volume of the brand itself is not independent. Promotional activities are endogenous levers that the organization can directly control, so they should not be used in the sales driver model. In fact, promotion response should be undertaken only after fully incorporating all of the exogenous drivers.

Predicted values from this statistical model can be thought of as potential scores – the expected levels of brand sales considering the exogenous factors only. Note that the potential scores are scaled to the current level of brand sales and do not reflect the upside potential of the brand. However, potential scores can be easily scaled to reflect any future or upside level of sales, and can be instrumental in the forecasting process.

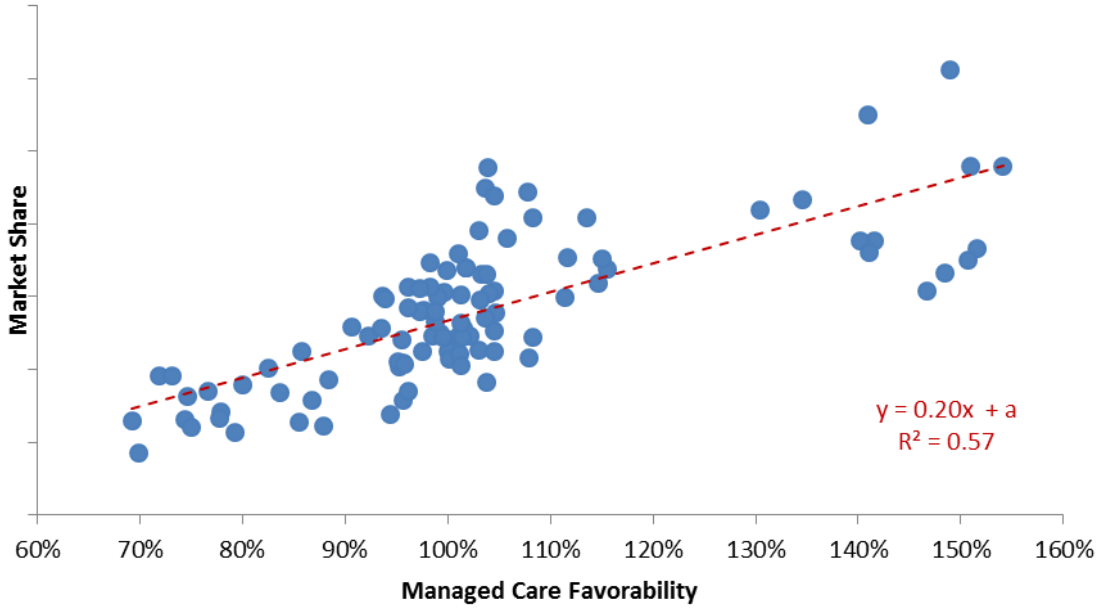
Any statistically significant explanatory variables in this statistical model are to be considered the important drivers of brand sales and therefore brand potential. These are the factors that should be accounted for explicitly in the sales and marketing processes. When these drivers are ignored, problems inevitably result in the downstream processes. For example, managed care is known to be a strong driver of, or barrier to, market position; however, there are a variety of ways in which managed care influences brand performance. Two important aspects of managed care include:

- Managed Care Favorability – How favorable a specific brand is positioned by managed care plans and payers. For example, brands in tier 2 have higher favorability than brands in tier 3, and prior authorization will lower a brand's favorability. All plans and payer types should be considered, and every customer should be assigned a managed care favorability score based on his or her patients and their full mix of managed care plans and payers.
- Managed Care Control – How much managed care plans and payers influence brand sales across brands. Some plans and payers, and some geographies, have less ability to move brand sales, regardless of their positioning of the brands.

Managed care favorability is found to strongly influence customer-level brand choice, and this dynamic plays out at the geographic level as well, based on the mix of plans and payers across the geographies. In fact, the managed care drivers of customer-level brand success are highly significant drivers of geographic brand success and overall brand sales. Managed care control leads to differential promotion response, and should be factored into resource allocation and tactical execution decisions.

In this case study, managed care favorability was found to be highly correlated to brand market share performance across sales territories. This brand has a high degree of variation in brand adoption across territories, and managed care was found to be the most important driver of this variation. The following diagram illustrates this relationship (Figure 1):

Figure 1: Territory Market Share and Managed Care Favorability
Managed Care is a Key Driver of Brand Performance



In this case, 57% of variation in brand market share across territories could be explained by the brand's Managed Care Favorability within the territory. These findings have very direct implications for managed care contracting – primarily prioritizing payers and setting specific terms. But another implication of this dynamic is that different territories have very different opportunities and, given how important this dynamic is, it is vital for the organization to account for managed care favorability in targeting, allocation, messaging, alignment, and incentive compensation.

This finding is fairly typical of many brands, where managed care accounts for 40-70 percent of the brand's variation in market share across territories. The industry recognizes managed care's general role, but it is often poorly understood exactly how managed care influences specific brands. Having robust measures of how managed care impacts brand performance is critical for contracting and rebating decisions, and is also a necessary step to properly estimating true brand potential for forecasting, targeting, alignment, and incentive compensation.

Robust Metrics for Each Key Driver

Robust metrics for each of these factors are needed to fuel the model. Metrics in the sales driver model need to be carefully constructed to capture the true essence of each driver and to be as accurate as possible. Sometimes, metrics created for other purposes do not reflect the true drivers needed by the sales driver model. And, even if the metrics do capture the intended drivers, they often have flaws that limit their usefulness in the sales driver model. Having the best metrics possible will help ensure that the model is as powerful as possible.

One should carefully consider the specific meaning and implications of each metric and its applicability as a sales driver. At issue is whether or not the metric adequately portrays the factor one is trying to represent for the purposes of developing a sales driver model. For example managed care metrics commonly in use are notoriously poor at capturing true managed care dynamics such as brand favorability. A managed care metric that accounts for tier position but not copay and prior authorization does not truly measure brand managed care favorability. As a result, they do not perform well at explaining brand performance. Specific metrics should be developed that capture varying aspects of managed care, so the different effects can be adequately represented. Understanding exactly how managed care influences brand success is especially critical when developing potential scores. And it is just as important when optimizing the sales and marketing processes.

Accuracy of the metrics is also of paramount importance – a number of issues exist which complicate the use of existing metrics. Some metrics are relevant, but are flawed by various data or modeling issues. For example, physician specialty is frequently a factor in explaining differential brand performance across prescribers, and it is conceptually very simple. However, in internal and third party data sources, the labeled prescriber specialty is sometimes not the true focus of a prescriber's practice. This situation arises in part due to physicians training in a general specialty area (for example, Internal Medicine), and then completing a fellowship in a subspecialty (for example, Cardiology). Different data bases might label the physician's specialty as Internal Medicine or Cardiology. In reality, a physician who completed a Cardiology subspecialty could limit his or her practice to Cardiology, or he or she might be practicing general Internal Medicine post-fellowship. The net result is that the specialty must be inferred based on prescribing focus and other data. While this case is not the norm, it happens frequently enough to bias the sales driver model. By correctly labeling each prescriber with his or her true practice specialty, the brand sales driver model is better able to understand how specialty influences brand sales, as well as the other drivers.

Derived metrics, such as percentages or ratios from prescribing data, or more complex metrics such as those derived from patient-level data are also sources of inaccuracy in the sales driver model. Small sample sizes, outliers, and differential capture rates need to be accounted for with proper techniques. These derived metrics should be crafted with techniques such as Bayesian estimation and errors-in-variables models to avoid such problems.

How the Components Fit Together to Drive Brand Performance

An important part of the sales driver modeling process is allowing the model to optimize use of the individual component factors. The metrics themselves can even be constructed by the sales driver model. Allowing the model to parameterize the individual components is an ideal way to ensure that the individual data components are used as effectively as possible. The sales driver model can determine the most appropriate functional forms and parameters.

Aside from having the best possible metrics for each factor, the sales driver model must be flexible enough to account

Figure 2: Statistical Sales Driver Model

$$Brand\ Volume_p = f\left(\sum_{J=1}^{n} Competitor\ J_p, Specialty_p, MC\ Favorability_p, MC\ Control_p, Segment_p, etc.\right)$$

for real-world complexities. Successful sales driver models typically contain both linear and nonlinear elements. Modeling brand sales volume as a function of other brands is theoretically a linear function. Nonlinear functional forms will tend to lead to patterned residuals, with over- or under-prediction at the extreme values. Most of the other sales drivers should be modeled with nonlinear functional forms. Nonlinear regression may be used, but other nonlinear techniques such as CHAID may be used as well. The sales driver model must properly capture how the factors truly drive brand performance, but it is also critical that the model outputs are compatible with the subsequent sales and marketing processes. These models will provide continuous potential scores for each customer that reflect the underlying brand sales potential.

Building a Total Potential Score to Reflect Underlying Potential

Armed with a solid grasp of the drivers, and robust metrics of them, one can build a sales driver model. Results from the sales driver model are used to develop potential scores to reflect the underlying potential for each customer. The potential score is a predicted value generated by the model, and reflects the expected brand sales, given all the important exogenous factors. Potential is independent of actual brand use, but should be correlated with brand use, particularly with mature brands.

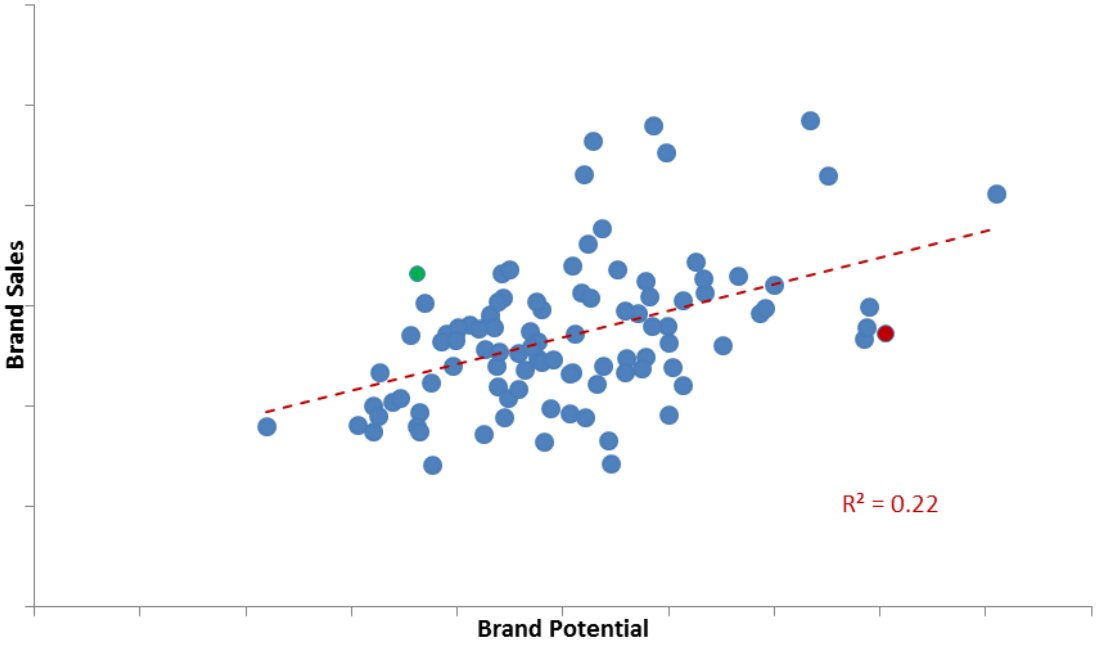
The statistical sales driver model can be represented generally by the above formula (Figure 2), where *J* represents all potential competitors, related brands, or interactions, and *p* represents all *n* potential customers. Other variables should be included as the brand situation requires.

Note that some of these factors may be considered either endogenous or exogenous, but a determination must be made as to whether or not each factor is to be considered "in play" for decision-making purposes. For example, a brand's managed care position is, at least to some degree, under the brand's control, but can be considered to be exogenous for purposes of targeting customers, aligning territories, and compensating the sales force. For optimizing managed care contracting, managed care favorability should be considered endogenous and not included in the sales driver model.

Note that the potential score is independent of actual brand use. Brand sales for any individual doctor can be higher or lower than the potential score. The potential score reflects the expected value, given all the important factors, so performance relative to this expected value is much more of a true performance score and can be used in promotion response and incentive compensation.

Revisiting the case study introduced earlier, the scatterplot below shows the actual brand sales as they relate to the potential score at the territory level.

Figure 3: Territory-Level Brand Sales and Brand Potential



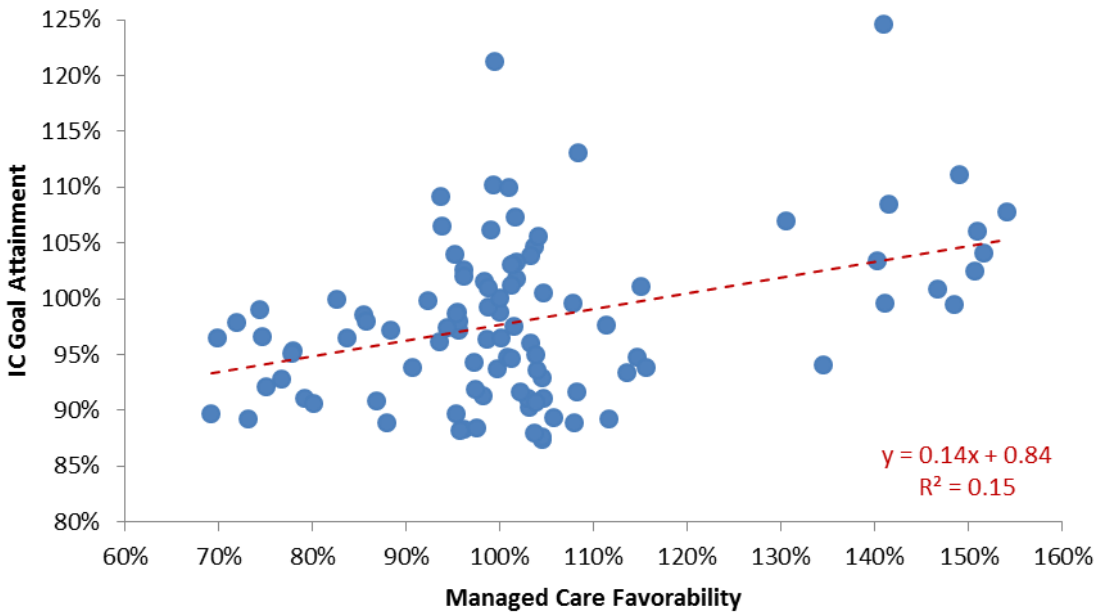
In the below example (Figure 3), the territory shown in red has average brand sales, but because it has high brand potential, it is actually under-performing relative to its underlying characteristics. The territory shown in green is over-performing relative to its potential -- given its managed care favorability and other factors driving brand performance, the potential score suggests the opportunity within this territory is lower than average. As long as all the drivers have been properly accounted for, performance relative to the potential should reflect individual representative performance.

More generally, promotion response should be measured with respect to historical and potential sales. This relationship forms the basis of effective resource allocation. For example, should samples be given to customers with high actual sales or high potential sales? Calls, patient copay offset programs, telepromotions, and other promotional activities may have different response characteristics that should be taken into consideration when targeting and executing these activities.

Optimizing the Sales and Marketing Processes

With a firm grasp of what drives brand success and robust metrics of value for each potential customer, one can optimize the sales and marketing processes. The territory alignment process should incorporate brand potential in the balancing of sales territories. When territories are not well balanced based on true brand opportunity, other problems begin to surface. It becomes more difficult, or impossible, for certain territories to meet their sales goals, while other territories are almost certain to meet their sales goals. This situation undermines the desired motivational effect that incentive compensation is supposed to have. Typically, adjustments to the goaling

Figure 4: Territory Goal Attainment and Managed Care Favorability BEFORE Considering Managed Care in IC Plan



process are made to compensate for the imbalance across sales territories, but it is impossible to correct the underlying balance without knowing the underlying potential in each territory.

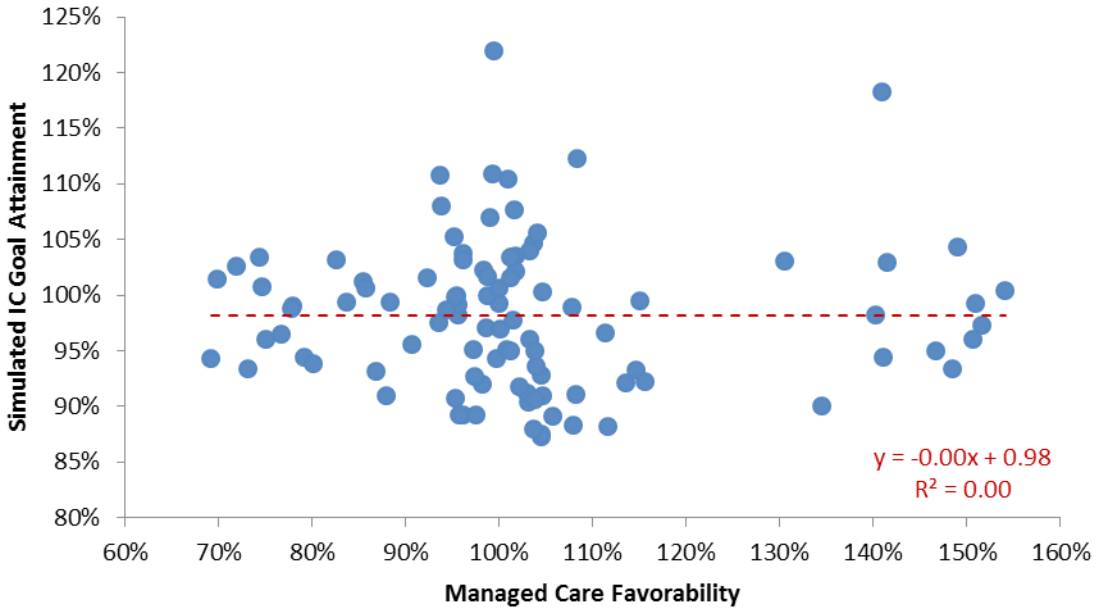
Promotion response work that does not consider true brand potential in light of the key sales drivers will associate high levels of brand sales, or changes in sales, to promotional activities; whereas, in reality these levels are largely due to the underlying sales drivers. Without using potential scores, promotion response estimates are biased, leading to misallocation of resources, and poor tactical execution.

And without potential scores, customer segmentation is not as meaningful and messaging may not be appropriate. In order to have the most meaningful customer segments, it is critical to know how the customers within each segment respond differently to the different sales drivers. For example, certain segments may be more influenced by managed care than others, and may require messaging that addresses managed care coverage and how to overcome managed care obstacles. Latent-class derived attitudinal segments, which are more informative than traditional segments, can even be derived through the potential modeling process.

To illustrate how to optimize these processes, consider the case where a sales-driven compensation system is deemed to be unfair to certain sales representatives. Because of its direct link to sales representative pay, incentive compensation is always in the spotlight and is a common area where sales and marketing operations issues first surface. Although, incentive compensation itself is rarely the root of the problem.

A principal step in evaluating the situation is to determine how incentive compensation goal attainment varies with the core drivers of brand success. Normally, there should be no significant relationships between the exogenous variables and goal attainment. The scatterplot below reveals a systematic bias in the relationship between managed care favorability and incentive compensation goal attainment.

Figure 5: Territory Goal Attainment and Managed Care Favorability AFTER Considering Potential in IC Plan



Representatives covering territories with more favorable managed care situations have higher attainment and higher incentive compensation payouts. This pivotal finding is evidence that the goaling process has not adequately considered managed care, and that the system may be unfair to representatives with managed care barriers. (Figure 4)

Having robust measures of managed care allows the organization to examine the true relationships between incentive compensation attainment and managed care. By taking managed care into account, one can determine the true potential of each customer and each territory. By including managed care favorability in the potential score process, incentive compensation goals can be set which recognize that favorable managed care territories have more inherent potential than other territories.

Simulating goals when using the measure of true potential in the goal-setting process, the following illustration shows how attainment versus the revised goal would no longer be systematically biased with respect to managed care favorability. (Figure 5)

Sales representatives with less favorable managed care plans and those with more favorable plans now have equal likelihood of achieving their incentive compensation goals. This plan revision results in a more motivated sales force that will be more effective at driving sales increases. Beyond sales increases, this revision also resulted in fewer complaints, less management involvement, and overall higher employee satisfaction and motivation.

A quick fix of the incentive compensation process can mitigate some concerns, but will not fully address the problem, because managed care favorability is typically insufficiently considered in the alignment process. Two territories may be balanced based on brand and market prescribing, but have very different opportunities if one territory has a favorable managed care situation and the other territory has

a poor managed care situation. Often the alignment process draws from the targeting process to identify business opportunity that needs to be balanced; however, the targeting process often does not adequately consider these factors either! The result of not fully considering the true business drivers is that the wrong customers are targeted, territories are unbalanced, and representatives are not motivated by the incentive compensation system.

The ideal solution would be to create a robust metric of managed care favorability, create true potential scores for each customer and territory, re-align territories to optimally balance true potential in each territory, and re-set incentive compensation goals based on the true opportunity. Even without the complete overhaul of targeting and alignment, these true potential metrics can be used in the goal setting process to create goals that are more fair and motivating.

SUMMARY

By uncovering the true drivers of brand potential and creating robust metrics, a sales driver model can be developed and used to generate a potential score. When the potential score is integrated into sales and marketing processes, such as targeting, territory alignment, and incentive compensation, brand performance is optimized. The result of fully integrating the true business drivers is that the right customers are targeted, territories are balanced, and representatives are motivated by the incentive compensation system. This solution yields dramatically improved sales, as well as improvements in subjective measures such as employee satisfaction and morale.

Key Words: *Potential scores, brand opportunity, sales drivers, promotion response, managed care influence, incentive compensation*

About the Author

Kevin Kirby, Partner with Michael Allen Company, has over 20 years of Biotech and Pharmaceutical industry experience. He is an expert in management science with the pharmaceutical and biotech industry. Kevin also developed expertise and applications in the areas of promotion response, targeting, sales force size and structure, patient-level analytics, resource allocation, and managed care analytics. He has helped many organizations increase the overall effectiveness of their sales and marketing efforts.

Kevin formerly led Decision Support at Genentech and, prior to that role, led Promotion Response and Targeting at GlaxoSmithKline. Kevin is a Past President of the PMSA. He holds a bachelor's degree in Statistics and Economics, and a master's degree in Operations Research from North Carolina State University.

The Relative Contribution of Message Optimization and Physician Targeting on Enhancing Detail Effectiveness

An Application Using a Discrete Choice Approach in the Oncology and Primary Care Markets

Brian H. Gibbs, Ph.D,Vice President, Consulting Analytics, ImpactRx, a Symphony Health Solutions Company, Brian.Gibbs@symphonyhealth.com

Introduction

A wide range of research suggests that the most promising paths for enhancing detail effectiveness are to modify message mix to shift emphasis to messages with the greatest resonance and impact, and/or targeting away from physicians who are largely unresponsive to personal promotion to less costly non-personal channels.

In most instances, these insights are generated independently. That is, a sales operations team may tackle the task of identifying the level of physician responsiveness to detailing which then informs physician targeting and reach, sales force sizing and alignment. Simultaneously, but independently, marketing teams tend to tackle the effectiveness of the content communicated in personal promotion and the design of more effective communication. Based on case studies conducted among Oncologist and Primary Care physician, the results in this paper strongly suggest that these two efforts should not be assessed independently. Failure to integrate may lead to false reads on the effectiveness of messaging strategy resulting in suboptimal targeting and communication strategies.

Core Objectives

The core objectives of this paper are to provide an assessment of the extent to which detail effectiveness can be enhanced through a mix of modifying message emphasis and physician targeting. Understanding the potential to enhance detail effectiveness via these two levers, and their relative contributions to potential improvement, is critically important to marketers in an environment in which they are expected to achieve solid results with fewer and fewer details.

The specific objectives of this paper are to provide the following insights:

- To what extent can the detail effectiveness be increased by shifting message emphasis away from ineffective messages?
- To what extent can detail effectiveness be increased by shifting targeting away from physicians who are non-responsive to personal promotion?
- To what extent can detail effectiveness be increased by simultaneously modifying message emphasis as well as physician targeting, and what are the relative

contributions of these two potential levers for improving effectiveness?

Background, Design and Estimation

Background and Design

Oncology Case Study: The Oncology analysis was based on promotion and first line treatment data in the competitive breast cancer market with six competing products as reported by the ImpactRx Oncology panel physicians. The models were based on approximately 2,000 sales rep details delivered across all competitors in the market, and approximately 1,000 1st line treatments filtered on HER status in a specific setting over the course of a year.

Primary Care Case Study: The primary care analysis was based on promotion and NWRx+, or treatment choice, in a pain market with three competing products as reported by the ImpactRx PCP panel physicians. The models were based on approximately 15,000 sales rep details delivered across all competitors in the market, and approximately 1,000 NWRx+ treatments over the course of six months.

+ NWRx defined as naïve patients, switched patients and add-ons.

Estimation Methods

Model Structure and Estimation: Promotion response models were developed for client and competitor detailing efforts using each physician treatment choice vis-à-vis a patient as the modeled outcome. A Koyck (adstocking) approach was employed to incorporate the history of physician exposure to all detailing/ messaging by all brands in each market. Each physician treatment choice vis-à-vis a patient is modeled as a function of his/her accumulated exposure to details and detail content (messaging) at the point of choice controlling for patient characteristics, physician's perceptions of these detailing efforts, delivery and execution tactics and managed care influence. Models were estimated using a discrete choice estimation approach. (Figure 1)

Figure 1: Choice Estimation Approach

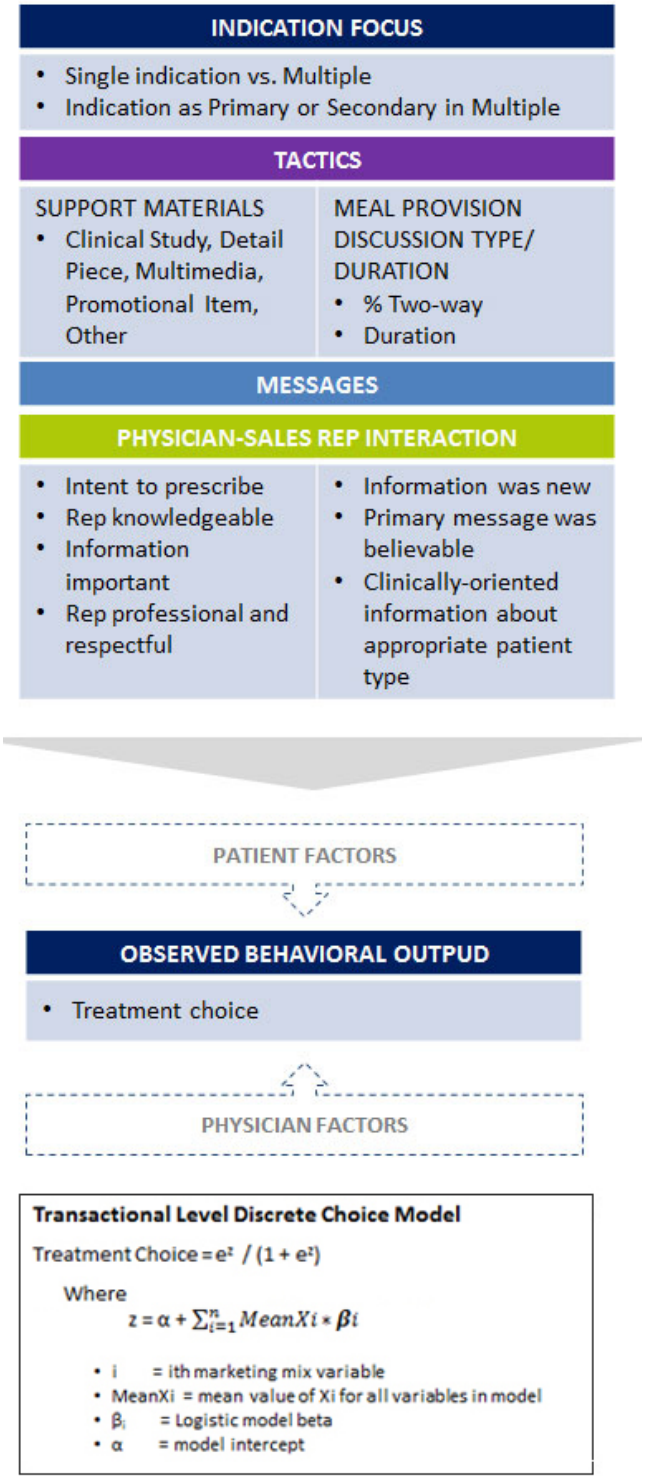
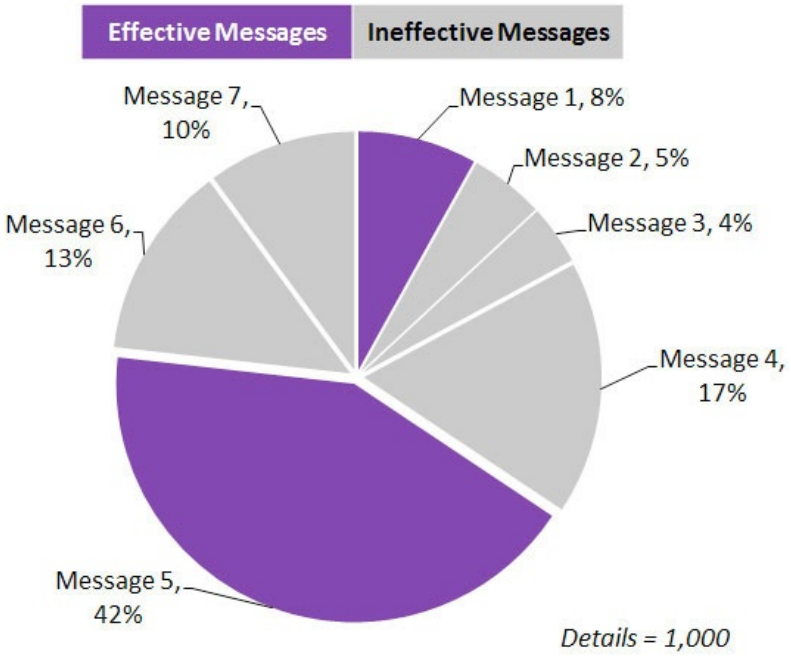


Figure 2: Current Message Mix & Effectiveness for ONCOLOGY Brand X



Results

Oncology Case Study

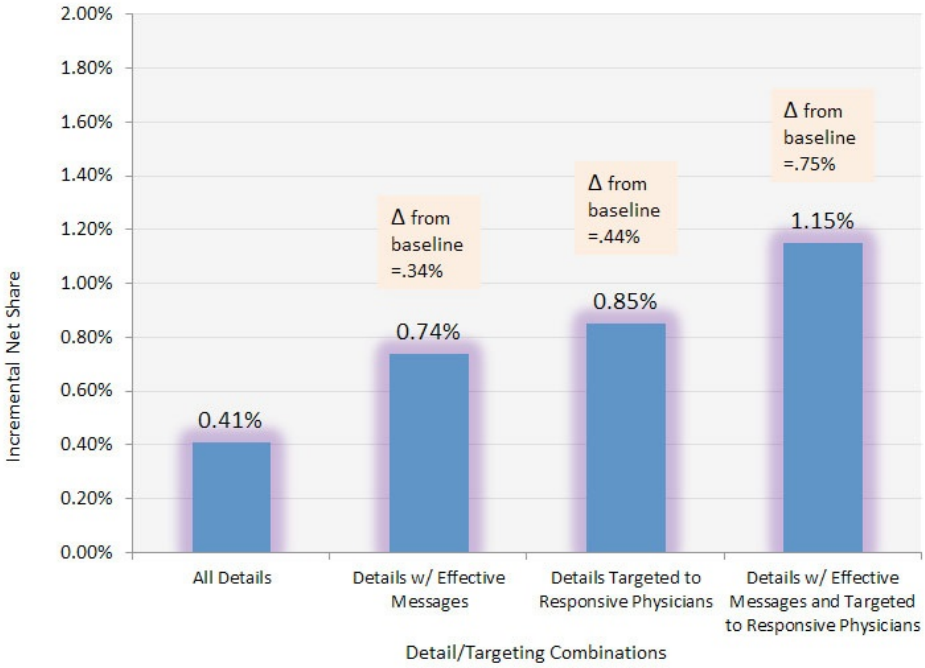
Message emphasis was highly concentrated for the Oncology case study brand with the most frequent primary messages delivered in approximately 40% of the details. Of the six primary messages, two messages (messages 1 and 5) were identified as significant positive drivers of 1st line treatment choice for the case study brand among the relevant patients per chart below. Approximately 50% of the details were delivered with the two messages that were effective for the study brand in this market. (Figure 2)

Using a latent class approach, ten percent of the physicians were identified as non-responders to details by the case study Oncology brand. When those physicians were removed and the model was re-estimated the two original messages (1 and 5) as well as one other message (4) emerged as significant drivers of treatment choice.

Comparative Detail Effectiveness Results

Further analysis shows that detail effectiveness for the Oncology case study brand could be enhanced by simultaneously changing message mix and targeting away from non-responsive physicians with projected incremental lift in detailing from .41% to 1.15% from those changes. A slightly greater proportion of the projected increase in detail effectiveness could be achieved through modifications to targeting than changes in message emphasis. There are notable synergies for simultaneously changing targeting away from non-responders and modifying message mix. (Figure 3)

Figure 3: ONCOLOGY Brand X Effectiveness Results



Primary Care Case Study

Message emphasis was relatively evenly distributed for the primary care case study brand among eight primary messages. Two of the primary messages were identified as significant positive drivers of the study brand NWRx treatment choice across all targets per below. Approximately 25% of the details were delivered with messages that were effective for driving treatment choice for the case study primary care product (Messages 2 and 8). (Figure 4)

Using a latent class modeling approach, fifteen percent of the physicians were

Figure 4: Current Message Mix & Effectiveness for PRIMARY CARE Brand X

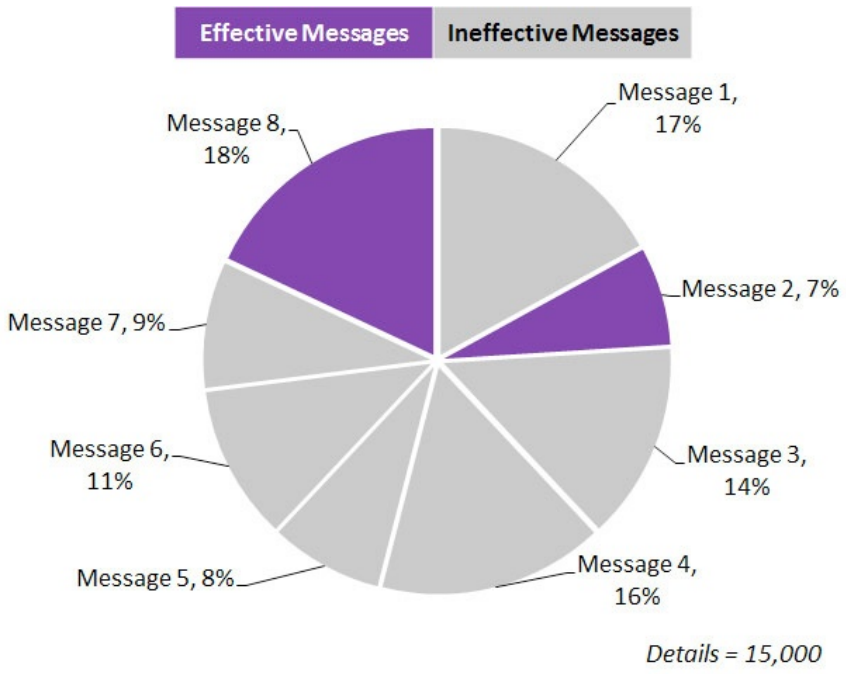
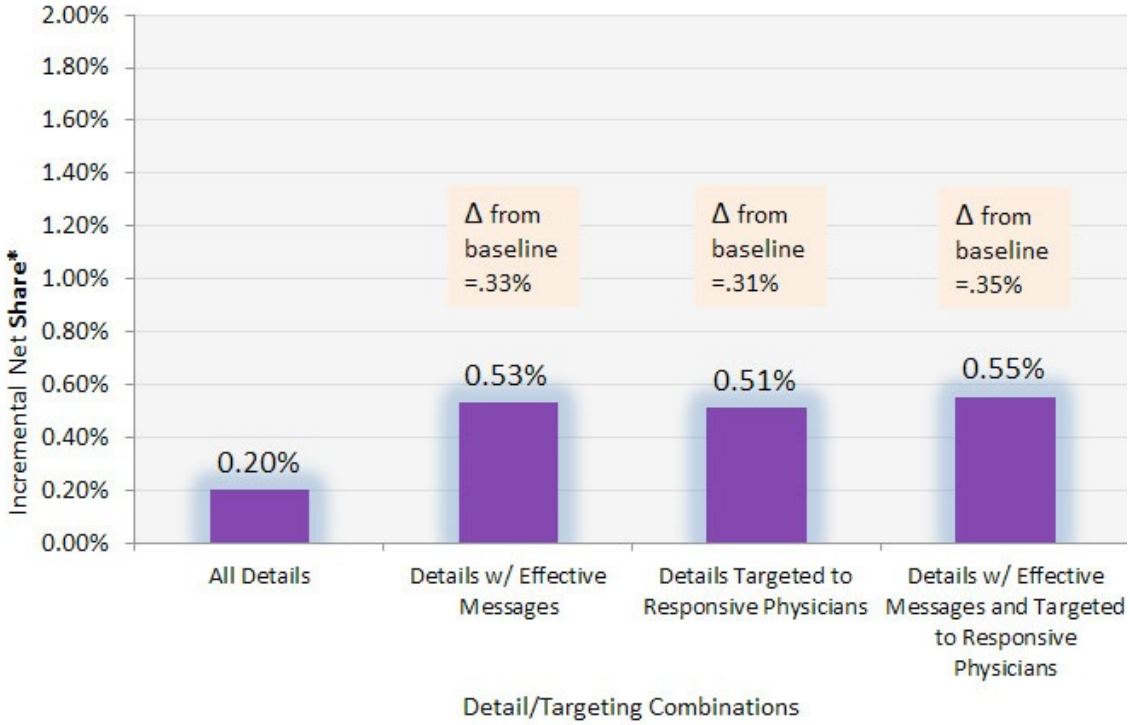


Figure 5: PRIMARY CARE Brand X Effectiveness Results



identified as non-responders to details for the case study primary care brand. When those physicians were removed and the model was re-estimated the two original messages (1 and 5) as well as four other messages emerged as significant drivers of case study product treatment choice.

Detail Effectiveness for the case study primary care product could be enhanced by modifying message mix and shifting targeting away from non-responsive physicians with a projected incremental lift in effectiveness from .20% to .55% from those efforts. A relatively greater proportion of the projected increase in detail effectiveness could be achieved through modifications to targeting than changes in message emphasis. There are no notable synergies for simultaneously changing targeting away from non-responders and modifying message mix. (Figure 5)

Key Conclusions and Take-Aways for Marketers and Marketing Scientists

- **Enhanced Detail Effectiveness through Changing Message Emphasis:** There appears to be notable incremental benefits from assessing message effectiveness and shifting sales rep emphasis to effective messages and/or modifying ineffective messages. For the products in this study the incremental share benefits from using effective messages was ~75% greater than using current message mix.

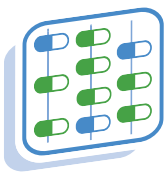
- **Enhanced Detail Effectiveness through Targeting Away from non-responsive Physicians:** There appear to be notable incremental benefits from shifting personal

detailing away from *non-responsive* physicians. The benefits of this re-targeting are may exceed those from changing message mix and emphasis

- **Improved Message Effectiveness Evaluation through a 'Responsive' Physician Lens:** For both case study products a greater number of messages emerged as significant drivers when messages were assessed using *responsive* physicians (rather than all physicians). These results suggest that heterogeneity to detail responsiveness may be masking significant message impacts, and resulting in potentially misleading message insights.

About the Author

Dr. Brian Gibbs is Vice President, Consulting Analytics, at ImpactRx, a Symphony Health Company. He has extensive experience in statistical modeling and consulting for healthcare clients having led more than 150 studies across a wide range of brand lifecycle issues. He was previously a Principal in the Management Consulting Practice at PriceWaterhouseCoopers, Vice President and Director of Advanced Analytics at GfK V2, and an Associate Partner at Rosetta Marketing. His academic experience includes seven years in applied social science research and teaching at the University of Michigan and Princeton University. Brian holds a B.A. in Mathematics and Political Science from Rutgers College, and a M.A. and Ph.D. in International Political Economy from the University of Michigan.



PMSA

PHARMACEUTICAL MANAGEMENT
SCIENCE ASSOCIATION

www.pmsa.net