Employing Sales and Marketing Strategies by Analyzing Healthcare Indicators in the Pharmaceutical Industry

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Abstract: This paper focuses on utilizing a systems approach to employ different sales and marketing strategies for pharmaceutical products across the United States. It is crucial to understand the ecosystem of the healthcare domain and the ever-changing incentive-based market that influences many of the decisions made by stakeholders. First, we analyzed the stakeholders that are interconnected throughout the ecosystem. Next, the team constructed three different levels of market score based on the different sales and marketing strategies researched, Low, Medium, and High Market Scores (LMS, MMS, and HMS, respectively). Afterward, the team assembled a model using outsourced health indicators data to analyze 500 cities across the United States to predict their respective market score. The model combines nine health variables with stakeholder analysis to calculate a predicted market score. Our proposed model should allow pharmaceutical companies to assign different marketing and sales strategies based on location in the complex healthcare ecosystem in the United States.

Keywords: Healthcare indicator, Obesity, Value modeling, Stakeholders, Ecosystem, Pharmaceutical industry, Push strategy, Pull strategy, High Market Score (HMS), Medium Market Score (MMS), Low Market Score (LMS).

1. Introduction

The healthcare system is, in many ways, the most consequential part of the United States economy, as it supports Americans' health and well-being. According to National Health Expenditure (NHE) data, Medicare spending grew 3.5% to $829.5 billion in 2020, while Medicaid spending grew 9.2% to $671.2 billion in 2020 (Rama, 2022). Worldwide prescription sales are forecast to grow at 6.9 percent annually from 2023 to 2028, with experts citing a growing aging population, increased life expectancy, and rising chronic disease prevalence as drivers of this projection (Nurhayati, 2023). As more people live over 65, the costs of Medicare and Medicaid will continue to rise. In other words, healthcare is becoming a more integrated industry with American people's lives.

Patients are direct beneficiaries of the healthcare system, with millions enrolled in Medicare and Medicaid services and private insurance coverage available. With the cost of healthcare services increasing at an average rate of 12-13% every year, Americans are having difficulty keeping up with the cost of healthcare (Glied, 2003). The healthcare ecosystem must continue to adjust and evolve while finding the optimal balance between service and managing business operations. Controlling price stability and adapting to economic fluctuations while maintaining routine services is one of the battles healthcare systems must tackle (Glied, 2003). Pharmaceutical companies must develop an effective sales and marketing strategy that reaches patients through all domains. Pharmaceutical companies that possess a sales force that focuses on the needs and wants of the market while simultaneously segmenting the market to reach their target audience result in a formula for success. The steps towards developing a holistically effective pharmaceutical sales and marketing strategy require understanding current marketplace shifts for optimal structure, technologies involved in sales force, and how technologies can affect the ability to reach patients or customers.

The primary purpose of this paper is to help optimize the market strategy for healthcare providers using healthcare indicators based on geographical location in the United States. This paper is sponsored and inspired by an undisclosed pharmaceutical company. The sponsored company tasked us to advise them on a Pareto efficient allocation of resources that maximizes the accomplishment of the company's strategic goals while staying aligned with the company's values. First, the

Proceedings of the Annual General Donald R. Keith Memorial Conference
West Point, New York, USA
May 4, 2023
A Regional Conference of the Society for Industrial and Systems Engineering

team conducted thorough research to comprehend the complex stakeholders involved in the healthcare system. All stakeholders are essential in the system, but the primary stakeholders in the healthcare system influence aspects of marketing strategy, impacting all stakeholders. Secondly, the team combined weighted stakeholder needs with publicly available data of critical healthcare indicators to locate major US cities that require further marketing focus. Lastly, the team developed market strategy recommendations based on the developed market score model.

2. Stakeholder Analysis

Our stakeholder analysis validated our understanding of the interactions in the pharmaceutical industry and explored our client's opportunities within this ecosystem. Our client aims to assist healthcare providers in providing care and treatment to patients. More specifically, the objective is to communicate to patients that a product is the right choice for them, given their medical indication. As seen in Figure 1, the complex relationships between the various stakeholders of the pharmaceutical ecosystem, notably patients, healthcare providers, pharmaceutical companies, and pharmacies, make the environment difficult to navigate. Understanding the nature of these interactions is quintessential in employing different sales and marketing approaches to maximize patient outreach. For example, healthcare providers are the main influencing factors driving patient behavior due to the trust between patients and their doctors. Advice given by a doctor to a patient depends on what the doctor thinks the patient can best adhere to and afford (Davari, Khorasani, & Tigabu, 2018). Generally, patients trust that doctors are educated on prescribing medicine and will make decisions that are in the best interest of their patients with regard to health and cost. While the decision on what route a patient takes is still in the hands of the patient, media and advertising also play a vital role in influencing patients' choices (Gellad & Lyles, 2007). As a result of the power dynamics in the system displayed in Figure 1, pharmaceutical companies must allocate their resources not just directly towards the end-consumer but also toward healthcare providers and larger organizations like hospitals.

Organizations need to be able to leverage their sales representatives to target the clients that maximize their growth potential. These clients are not always clear, with many factors influencing the growth margin, such as discounts and rebates, health insurance, 340B pricing, and many more. In this complex environment, it is worth observing factors that indicate growth. The 340B Pricing Program is a federal program requiring drug manufacturers to offer suitable healthcare facilities for reduced prices. Eligible entities are those mostly of underserved areas that meet a set of requirements (340B Drug Pricing Program, n.d.). Many of these factors are outside the control of decision-makers in pharmaceutical companies, but must be considered in the allocation of resources.

An aspect that influenced the marketing strategy for pharmaceutical companies is the COVID-19 pandemic. The pandemic affected the strategic and operational employment of pharmaceutical companies' resources. Our stakeholder analysis indicated that the COVID-19 pandemic exposed the urgent and consistent need for healthcare services, resulting in the need to adapt to an increasingly digital environment. This is consistent with industry research, which shows that 66 percent of survey respondents in the healthcare industry believe companies will move away from traditional sales rep models due to restricted access, increased virtual interactions, and low perceived return on investment (Balz, 2021). Instead, pharmaceutical companies learned that embracing a simplistic strategy while only employing high perceived value levers optimized the implementation of company imperatives.

3. Theory

Existing literature on the pharmaceutical industry's sales and marketing strategies focuses on physician-pharmaceutical sales representative interactions. Observational research shows that physicians have a positive attitude toward pharmaceutical sales representatives and find sales reps essential sources of education and funding (Fickweiler & Urbach, 2017). Furthermore, the study found that interactions come in personal communications, gifts, meals, sponsored travel, funding for research, and honoraria. These physician-pharmaceutical sales representative interactions are representative of "push" sales strategies which are strategies that push products through the marketing channel (Parker, R. S., & Pettijohn, C. E., 2005). Pharmaceutical companies have pivoted their sales and marketing strategy to include "pull" strategies in an increasingly digitalized and virtual environment. This method will help pharmaceutical companies utilize advertisements to inform consumers to be empowered and drive prescribing behavior for particular products.

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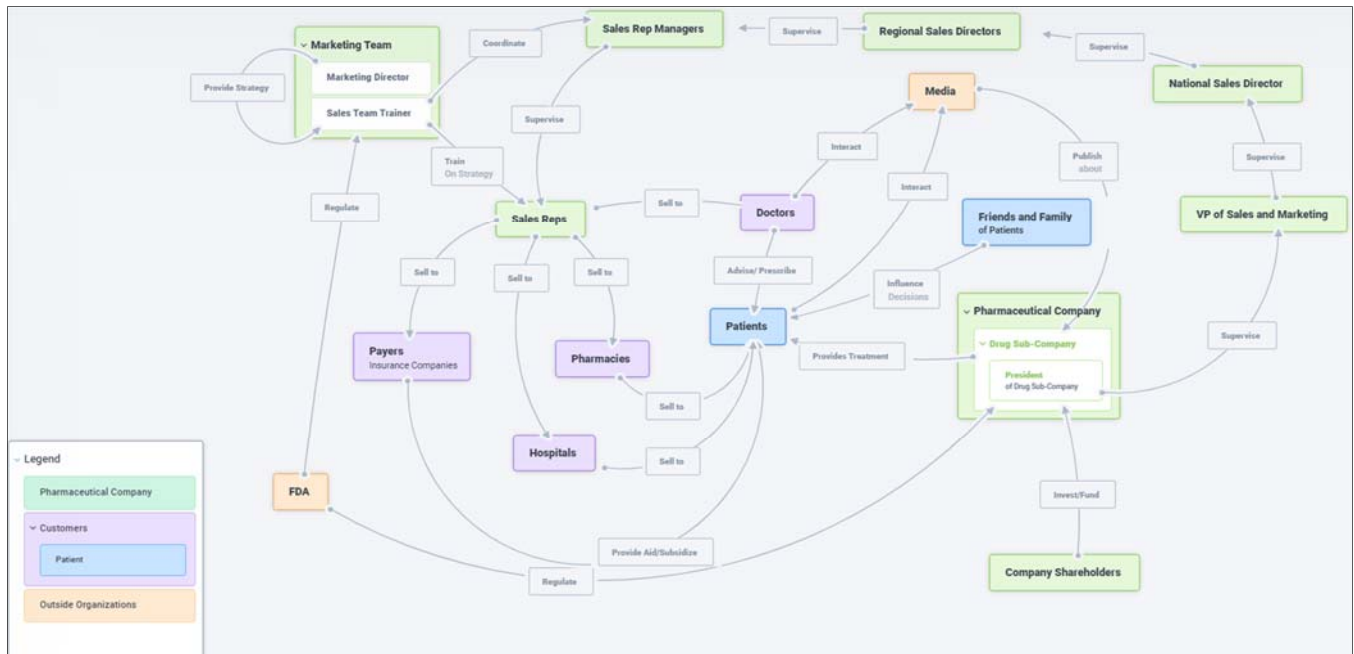*A Regional Conference of the Society for Industrial and Systems Engineering*

Figure 1. Mapping the Healthcare System Stakeholders and Interactions

In this area, the literature did not address the location of several health indicators in the United States region. To address the shortcomings of existing literature, we created a quantitative model by analyzing locations in the United States and assigning their potential growth in sales and marketing based on input from our client. We created a value model using stakeholder analysis and data analytics on the health status of individuals in large American cities. Based on stakeholder analysis and data collected through interviews, nine health variables were identified as critical factors driving the overall health of a city: access to healthcare, obesity, sleep, high blood pressure, coronary heart disease, pulmonary disease, diabetes, stroke, and high cholesterol. Our stakeholders then ranked each variable and weighted them in importance relating to the healthcare industry, specifically to products and services the parent company can provide. The output of our value model is a market score, ranked Low Market Score (LMS), Medium Market Score (MMS), and High Market Score (HMS), indicating a need for better healthcare presence in each location.

The model's theoretical application involves optimizing three different levels of sales and marketing strategies corresponding to a market score. The first level of marketing score is HMS, which requires an upscaled investment of resources yet yields the highest effectiveness toward customer influence. The first level requires investments towards research funding, many sales representative interactions with healthcare providers, and offering sponsored medical education events (Fickweiler, 2017). An investment towards research funding involves sponsoring higher-level education to conduct research in the pharmaceutical industry. The second level of market score is MMS, which requires a moderate investment of resources. The second level requires contributing free drug samples to healthcare providers, a moderate number of sales representative interactions with healthcare providers, and providing industry sponsored lunches (Fickweiler, 2017). The third level of market score is LMS, which requires a nominal investment of resources to maintain influence. The third level involves mass advertisements through different media avenues (social, television, brochures) and a modest number of sales representative interactions with healthcare providers (Fickweiler, 2017). The first two levels embrace the "push" strategy of sales and marketing, while the third embraces the "pull" strategy to diversify influence.

Our literature review shows that pharmaceutical companies understand the effectiveness of their resources but cannot efficiently leverage them given the ever-changing market. Applying a systems approach in the breakdown of such problem pharmaceutical companies face can aid these companies in optimizing their outreach to patients.

4. Model

The data from our model comes from The 500 Cities Project, a project by the CDC that measures 27 health metrics across health outcomes, health risk behaviors, prevention, and health status (CDC, 2022). This information reflects the estimates for generating a healthy population and enables the retrieval and exploration of the largest 500 cities that impact population health. The information provided allows individuals to identify impending health problems, enact and observe health objectives, and educate citizens regarding developing and implementing prevention methods. Below are the data variables describing each of the nine variables and how heavy each is weighted in the model's output based on our stakeholder values. Each variable was then ranked and weighted in importance related to growth in the pharmaceutical industry, specifically to products and services the parent company can provide. In this paper, we propose a new metric called Market Score, calculated by the sum-product for each variable's raw score and corresponding stakeholder weight for each of the 500 cities' as shown in the equation below.

Table 1. Established Variables Weights Based on the Stakeholder's Value Analysis

Variable	*Weight*	*Variable*	*Weight*
Access to Healthcare	6	Pulmonary Disease	14
Obesity	14	Diabetes	10
Sleep	4	Stroke	16
High Blood Pressure	12	High Cholesterol	4
Coronary Heart Disease	2		

$$Marketing\ Score = \sum_{i=1}^{n} w_i \times x_i \qquad (1)$$

5. Results

The resulting output of our value model is an individual Market Score given to each city in the United States. As presented above, we then sectioned these scores into LMS, MMS, and HMS rankings. This model helps us provide a visualization that allows decision-makers to see trends in healthcare needs and adjust their allocation of resources accordingly. It also shows the impacts of pharmaceutical market components discussed above, including discounts and rebates, health insurance, and the 340B Pricing Program. In fact, the direct impact of the 340B pricing program aligns with the outputs seen in the map results. The total discounted purchases from 340B increased from $12 billion in 2015 to $38 billion in 2020. However, due to the lack of transparency and oversight, hospitals tap into most of these profits while patients seldom benefit from this pricing program (Mulligan, 2021).

Additionally, Figure 2 indicates a general trend of LMS on the West Coast, indicating that these cities tend to be healthier than others and have less potential for healthcare improvement. Issues stemming from the 340B pricing program, and the growth score trends, as indicated in Table 1, suggest that potential growth on the West Coast is limited. At the same time, places such as South Florida have significant room for healthcare improvement.

Sectoring the Market Score into three buckets allows for a strategic recommendation on the use of company resources that best optimizes patient outreach in a city based on its Market Score. We recommend pharmaceutical companies employ economic and high outreach resources in cities receiving LMS, such as mass advertising via social media. These strategies result in increased brand awareness and a nominal allocation of resources. Cities earning an MMS can most optimally be reached by utilizing a mix of moderate physician sales representative interactions and moderate cost resources like free drug samples and free sponsored luncheons. We recommend pharmaceutical companies to use their most effective resources in cities with HMS, even if the cost to the company is high. These resources are allocated mostly toward healthcare providers and have the strategic impact of driving prescriber behavior by leveraging healthcare providers' influence.

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Figure 2. Map of 500 cities in the United States and their respective Market Score

6. Conclusion

In conclusion, the model provided analyzes where the sales and marketing team should allocate their resources for a more significant impact on communities. The model also shows the selected variables as key factors driving potential growth in the pharmaceutical industry. Doctors, pharmacies, hospitals, and payers could use the data to focus on areas of interest and apply their skills and knowledge to provide better services. Our model is limited due to our data selection methods and the model's overreliance on stakeholder input. Data selected for the model does not account for age or population density and aggregates data to a city level rather than at an individual healthcare provider or consumer level.

Additionally, the model's overreliance on stakeholder input potentially limits the accuracy of the model's output depending on the accuracy of our stakeholders' understanding and foresight of the healthcare industry and tailored to their products and potential market. Although the model provides solutions to optimize resources for the current market, there are many unanswered questions for the future of healthcare. For one, many people still lack access to basic healthcare services. Second, the rising healthcare costs strain families and the government, making it difficult to provide affordable healthcare for all Americans. Finally, as technology continues to evolve, so does the aging population. Creating a healthcare system that provides adequate care for senior citizens will continue to be a challenge for healthcare communities.

The next step in this process is to employ agile methodology to look at supply chain issues in the pharmaceutical industry. The pharmaceutical supply chain faces several challenges, including supply chain visibility, drug counterfeiting, cold-chain shipping, and rising prescription drug prices, which can significantly increase out-of-pocket patient costs (Kaylor, 2023). Agile methodology is a project management framework that breaks projects down into six dynamic phases: plan, design, develop, test, deploy and review. Using the agile methodology allows us to satisfy customers through early, continuous improvement and delivery, welcome changing requirements, and respond to change that allows the team to be flexible. The agile methodology allows teams to shift strategies and workflows quickly without derailing the entire project (Laoyan, 2022).

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