The Impact of Biosimilars on the Provision of Value-Based Healthcare

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Biosimilars and Value-Based Healthcare

Biosimilar drug products, often referred to as biosimilars, are biopharmaceutical drugs which have been manufactured to mimic the medical treatment effects of existing, patented drugs, but are chemically or structurally changed by a small degree (Sekhon & Saluja, 2011). The introduction of biosimilars into healthcare has transformed healthcare across the world and created a more positive environment for patients in a healthcare market that is typically provider-favored. Biosimilars have the potential to make positive impacts on healthcare in ways that policymakers and corporate industries have failed in thus far. This impact involves introducing the opportunity for medical treatment and care to become more affordable to those without the appropriate access and means.

Biosimilars are recognized as highly similar drug alternatives to existing patented and approved biopharmaceuticals. They require stringent clinical and regulatory approval processes and are sold on the market for a substantially reduced price when compared to their original existing drug counterparts. The key advantage of using a biosimilar is that the same medical effect or treatment is provided to patients but at a reduced cost, thus increasing the affordability of necessary and often life-saving treatments (Blackstone & Joseph, 2013). While affordability is one prominent healthcare issue which requires attention within U.S. healthcare, there are serious concerns about the quality of healthcare provided as well. Substantially higher healthcare costs are associated with treatment of higher quality in the U.S., however, healthcare systems manage to accomplish similar and higher quality care with lower costs globally (Simoens, 2009). This fact is often attributed to physicians practicing what is known as the volume-based model of

healthcare in the U.S. The volume-based model of healthcare is practiced by providing the maximum quantity of healthcare that is needed to absolutely ensure the comfort and safety of the patient. The provision of healthcare using the volume-based model has been identified as a detrimental factor to U.S. healthcare both with respect to quality of care and affordability of care (Patel, Arantes, Tang & Fung, 2018). This model is recognized by many in healthcare to be outdated and what is considered the more efficient model is known as the value-based model.

The value-based model dictates that physicians or healthcare providers factor in the cost of treatments and the affordability of provided care in developing a plan that optimizes both cost and overall quality of care to maximize patient outcomes. This model is the more efficient of the two models of healthcare provision in this binary and at first glance it would seem that physicians would prefer to utilize the value-based model, but this is not the case (Gray, 2017). Physicians in the U.S., for the most part, still abide by the volume-based model due to financial restrictions and limitations that arise as a result of insurance companies, high cost drug treatments, and extended medical stays for more treatments of more complex conditions. Further integration of biosimilars as potential drug treatments for high-risk conditions has been shown to allow physicians the opportunity to deviate away from volume-based healthcare and practice forms of value-based healthcare (Erstad, 2016). In practice, this creates a much more affordable network for healthcare for millions of Americans who currently lack the access and resources to receive such high levels of care.

To this end, considering the high level of interdependency between a variety of individuals and organizations in the healthcare network, Actor-Network Theory (ANT) was used to investigate the role and connections between biosimilars and value-based healthcare

(Cressman, 2018). Incorporating clinical, regulatory, professional, and personal data and experiences of the vast stakeholders in the healthcare network allowed for the development and identification of connections that drive the impact of biosimilars on a physician's ability to abide by the value-based model (Kenney, 2016). This research paper, more specifically, responded to the following question: *How can the use of biosimilars increase the affordability of healthcare and consequently shift the current healthcare provision model towards one that is value-based?*

Research Question and Methods

Research Question: How can the use of biosimilars increase the affordability of healthcare and facilitate the shifting of the healthcare provision model to a value-based model?

The research question is addressed through two separate but connected approaches towards interpretation of compiled research. The first approach involves establishing the connection between the biopharmaceutical market, and more specifically biosimilar drugs, and the affordability of healthcare from the patient and provider perspectives. This approach builds the base network upon which the argument of the paper is developed and actor-network theory is applied to. The second approach involves identifying possibilities for the aforementioned connection between biosimilars and affordability of healthcare in impacting the practical application of value-based healthcare in the United States. Both sets of research approaches utilize literature review of primary sources and review articles. Specifically, sources are found using searches that focus on the following keywords: biosimilars, biopharmaceuticals, affordable healthcare, and value-based healthcare. These keywords are used to locate sources across medical journals These sources reflect personal experiences, systematic structures, and data from

various healthcare systems and backgrounds. Resources which reflected healthcare experiences, predominantly focus on volume- and value-based healthcare provision model execution. Alternatively, review articles and healthcare reviews are used to hone in and identify underlying networks and relationships existing between biosimilars and affordable healthcare. Network analysis is used concurrently with actor-network theory (ANT) to interpret the connections found from the second research approach and expand their implications to the broader context of the U.S. healthcare system (Wang et. al, 2014).

Background

Biosimilars exist to offer drug treatment alternatives to existing FDA-approved and patented drugs or therapies in scenarios where the existing biopharmaceutical treatment may not be effective in certain patients or may be unaffordable to a certain population (DiMasi, Grabowski & Hansen, 2016). Biosimilars often require a stringent and extensive regulatory approval process by the FDA to ensure that the product is physiologically comparable to its existing original drug counterpart (Reinisch & Smolen, 2015). Additionally, biosimilar patents cannot be approved and the manufacturing phase cannot begin until the patent for the existing counterpart drug has expired (Muller et. al, 2014). The key advantage to use of biosimilars as opposed to their counterparts is that they are often offered at a substantially reduced price on the drug market (Blackstone & Fuhr, 2007). As a result, the healthcare market becomes competitive with respect to particular drug products needed for specific conditions and disease states (Nabhan & Feinberg, 2017). The outcome is that patients now have multiple medically feasible

options for the same drug benefit, but have the added benefit of price selectivity amongst their options.

Biopharmaceuticals, on the other hand, are also recognized to be one of the primary contributors to high healthcare costs in the nation (Cohen, Faden, Predaris & Young, 2007). Introducing competition in drug pricing and product availability to both healthcare providers and patients allows for the opportunity to weigh both the quality and costs of care. Given the ability to factor in the cost of care into their treatment plans, physicians can now make decisions concerning treatment that are not solely prioritized towards ensuring the patient's health outcome, but also the patient's financial situation before and after treatment (Gray, 2017). Utilizing the freedom to factor in patient finance in their treatment planning, physicians can provide a different model for care. This model for care is described as the "value-based" model of healthcare and is defined as a system where healthcare providers are compensated for positive overall health outcomes of their patients rather than the overall quantity of care and treatments provided (Gray, 2017). The idea behind using the value-based model in practice is to reward, both institutionally and financially, physicians who provide the highest quality care for the lowest dollar cost to the patient rather than physicians who may utilize overtreatment as an assured method despite the egregiously high costs to the patient.

The value-based healthcare model, while not predominantly practiced throughout the United States, has been tested and utilized by some health systems nationally (Kenney, 2016). The results have shown the value-based model to be more effective and resourceful when patient final health outcome is used as a comparative metric against the volume-based model (Kenney, 2016). As a result of the value-based healthcare model, patients have the opportunity to receive a

more affordable treatment plan and there is currently potential to enable this healthcare model across health systems nationally with the proper political or legislative regulatory guidelines enacted.

Actor Network Theory and Healthcare

The complex series of links and networks that connect the biopharmaceutical industry with the healthcare industry require careful examination. The sheer number of stakeholders and entities directly involved with both of these institutions warrants a careful and detailed analysis to identify the pieces of the network that remain relevant to the research question at hand. Actor-network theory (ANT) is a social theory approach that involves examining aspects of the social and natural worlds solely through the existence of constantly shifting networks of relationships between aspects of these worlds. ANT posits that these networks are isolated and that nothing exists beyond these networks in an attempt to isolate the focus of relevant analyses (Latour, 1996). More specifically within the scope of this research, ANT is utilized to understand the ways in which these stakeholders interact with the entities and in turn how these interactions influence the movement of U.S healthcare towards a value-based model. A few of the relevant key stakeholders include patients, healthcare providers and biopharmaceutical companies. These stakeholders interact with institutions and entities such the U.S. government, insurance companies, and private healthcare systems to create the interactions that have an impact on how biosimilars are introduced and integrated into the healthcare system. These interactions also build the basis for how the value-based model of healthcare can be integrated into the U.S. healthcare system and how it could be received if there is a legislative agenda or regulation that

enforces the model (Simoens, 2009). In turn, the achieved degree of affordability of drug treatments and healthcare overall becomes a consequence of the interactions of the key players in these networks (Hirsch & Lyman, 2014).

ANT has proven to be a powerful tool when analyzing a system as complex as U.S. healthcare. It has even been shown to effectively discover hidden networks of importance that may exist between stakeholders or key players who may have not been linked with any prior significance (Cressman, 2018). However, ANT has also been shown to be highly dependent on the experiences, backgrounds, and desired outcomes of the user due to its subjective nature. Furthermore, ANT is limited in its use due to its focus on case studies and empirical observations. This limitation often comes to fruition via the identification of multiple networks and relationships in a given system, but little evidence or intangible discoveries to support those networks and their influence on the given scope of the problem at hand (Latour, 1996). One key benefit to using ANT is the ability to hone in on a portion of a system by "black-boxing" that portion. This would mean placing a restriction on the scope of a system being analyzed to limit the irrelevant deviations in the network that may spur from attempting to connect a large number of stakeholders and entities.

Recognizing the institutions and forces at play in the U.S. healthcare system and in the biopharmaceutical industry allows for a clearer understanding of how a product such as a biosimilar can have a vast ripple effect as to impact the thousands of physicians' usage of the value-based healthcare model. In particular, it has been established that ANT, above all else, is a useful tool for breaking down and piecing together complex situations such as the relationship that exists between institutions as large as the entirety of U.S. healthcare and the

biopharmaceutical industry (Cressman, 2018). As an STS framework, ANT is an effective tool at isolating the exact mechanisms behind which biosimilars and biopharmaceuticals can influence how healthcare providers treat their patients (Erstad, 2016).

Results and Discussion

The research project investigates how biosimilars may plan an impact on creating a more affordable health care system or treatment process for patients. Subsequently, this increased affordability would catalyze and encourage healthcare providers to practice the value-based healthcare model in their treatment of patients. This section observes and critiques various key stakeholders in the U.S. healthcare system and analyzes how their individual interactions may support or refute this potential relationship between biosimilars and value-based healthcare. Literature review and network analysis is performed on isolated and focused networks identified using ANT. Corresponding interactions between stakeholders are identified to be detrimental to the use of biosimilars as catalysts for value-based healthcare implementation. Consequently, it is established that the U.S. healthcare system currently possesses a variety of complications and obstacles towards the successful integration of biosimilars into the healthcare system for the purpose of stimulating the implementation of value-based healthcare approaches. While there exist benefits to fostering the integration of biosimilars into the healthcare system, their corresponding ability to assist in the integration of value-based healthcare approaches in medicine is compromised by bureaucratic and privatized interference. In the future, utilizing a more systematic approach for regulation of the interference by these organizations will allow biosimilars to play an active role in integrating value-based healthcare approaches in medicine.

Approach 1: Biosimilars and healthcare economics from the patient and provider perspectives

While the affordability of healthcare and the biopharmaceutical market seem many degrees removed from one another, in reality, they are substantially linked in U.S. healthcare. To understand how the biopharmaceutical market can impact healthcare affordability so significantly, one must first recognize the current timeline for the market. The biopharmaceutical market is currently experiencing a drastic turnover in approved patents for drugs, as the original wave of novel drug patents have expired or are near expiration (Schellekens, 2009). This fact paves the path for biosimilar drug patents to be submitted and approved and the consequent introduction of biosimilar drug products to the open healthcare market. The key difference between this new wave of biosimilars and the original wave of biopharmaceuticals is the drastically reduced pricing offered to the patient, considering comparable original and biosimilar drugs are typically equal in efficacy. Biosimilars are being widely viewed by the medical community as an economic disruptor in the marketplace (Blackstone and Joseph, 2013). This recognized disruption is increasing access to and affordability of treatments for high-risk conditions such as rheumatoid arthritis (RA), chronic skin and bowel diseases, and various forms of cancer (Simoens, 2009). Prior to biosimilar integration into the healthcare market, terminal conditions such as RA were often untreatable for lower socioeconomic class patients due to unaffordability over an extended period of treatment. Biosimilars contribute to a drastic positive shift in healthcare affordability.

Assessing this impact from the patient perspective provides a unique look into how drug affordability is truly influenced by biosimilars. In healthcare systems across the globe that have

been successful in providing affordable and accessible care to its constituents, it is estimated that biosimilar spending comprises 20-60% of total biopharmaceutical spending (Muller et. al, 2014). The U.S., on the other hand, has less than 10% of its total expenditure on biopharmaceuticals attributed to biosimilars (Mulcahy et. al 2017). This difference is also due in part to the less stringent regulation of biosimilar development and market dynamics that govern healthcare economies in developing nations and the European Union, however, significant room for growth and improvement exists in the U.S. market (Muller et. al, 2014). As a result of biosimilar integration into their healthcare marketplace, national healthcare economies have flourished around the globe. While the potential for broader gains to healthcare economies exists due to biosimilar entry into the marketplace, the real potential and lasting effects are exhibited at the bottom of the healthcare hierarchy with the patient and provider. The basis for the development and introduction of biosimilars into the U.S. healthcare market is partially attributed to the economic opportunity of cost-sharing between the patient and provider that can be facilitated with cheaper alternatives to existing reference biologics (Mulcahy et. al 2017).

The ability of biosimilar entry in the marketplace to impact the current cost-sharing dynamic in U.S. healthcare is critical to understanding the economic side of the system. Cost-sharing is the principle that defines how healthcare providers and insurance companies contract with one another to partially cover the cost of treatment, diagnoses, and drugs for patients that are "in-network" (Nabhan and Feinberg, 2017). The concept of being in-network simply means that a patient's healthcare provider or insurer has agreed in the patient-provider contract to cost-share a certain healthcare service or product. Healthcare economists have predicted that biosimilar entry into the U.S. healthcare market will eliminate significant

percentages of the margin that currently exists between patient payments and healthcare provider "in-network" coverage of medical expenses (Blackstone and Fuhr, 2007). This outcome will be the result of a general reduction in research and development costs for biosimilars as opposed to reference biologic products (DiMasi et. al, 2016). Additionally, the pressure put on healthcare providers to maintain high drug prescription administration will be significantly reduced as more and more patients will now be able to afford the life-saving biologic drugs they need and will more willingly enter the marketplace to purchase prescriptions at lower costs than before (Simoens, 2009). In effect, biosimilars will reduce the cost of treatment for patients by compensating their savings through decreasing provider profits.

While biosimilars provide direct advantages to patients, the resulting cost-sharing dynamic does not seem to benefit healthcare providers to the same degree (Mulcahy et. al, 2017). Healthcare providers must purchase biologic drugs at a certain "average sales price" (ASP) that reflects a blend of prices from all biosimilar and reference biologic drugs that are similar in function in their treatment towards a specific condition (Hirsch and Lyman, 2014). They are retroactively reimbursed for these purchases through insurance organizations and patient premiums (Mulcahy et. al, 2017). As a result, providers may experience losses as they could be reimbursed at lower rates than which they purchased the biosimilars at depending on geographical variations in insurance coverage and constantly fluctuating biologic prices (Blackstone and Joseph, 2013). Furthermore, the reduction of the margin differential of cost-sharing on the provider side is directly dependent on how a biosimilar manufacturer chooses to market and price their product to providers and their institutions (Mulcahy et. al, 2017). There exists a clear incentive for manufacturers to offer advantageous prices to healthcare providers to

expand their market share over a biosimilar category for a single reference biologic (Simoens, 2009). However, the overall incentives and advantages of integrating biosimilars into the marketplace seem to favor the patient more than the provider (Cohen et. al, 2007).

Approach 2: Healthcare economics and the value-based model

Establishing economic advantages for patients by introducing biosimilars into the healthcare market can be observed as a success, however, providers are key contributors to the healthcare process and there must exist some incentive or driver for their involvement as well (Simoens, 2009). While providers may not experience direct benefits from the introduction of biosimilars into the healthcare market, there is potential for a mutually advantageous relationship to form between providers and the application of the value-based model of healthcare (Erstad, 2016). In particular, value-based healthcare has the potential to act as a self-regulator for healthcare providers as it increases efficiency of provided care and cuts out the need for excessive healthcare administration and monitoring (Kenney, 2016). The value-based model has been thoroughly tested and incentivized throughout the European Union and the results have shown it to exhibit a profound improvement across a variety of metrics in the healthcare systems of EU nations (Gray, 2017). At its base, regardless of structure and regulation, the value-based model is supported and most effective in a healthcare system where human behavior on the part of providers and regulators is dynamic and where the patient's best interests in every aspect are prioritized. More specifically, for the value-based model to be successfully practiced, providers and regulatory institutions must be willing to alter their approach towards providing care (Mulcahy et. al, 2017). They must adjust their goals and regulations to allow providers to focus

on delivering efficient and cost-effective care and if possible offer incentives, financial or recognition-based, for adhering to these expectations. In practice, the value-based model is encouraged and constrained by a variety of supportive and restrictive elements, respectively (Erstad, 2016). These elements come in the form of patients, healthcare regulators, and governmental institutions.

Actor-network theory (ANT) is specifically employed to identify the impactful elements relevant to the argument that biosimilars can play a significant role in helping transition the predominantly practiced healthcare model from volume-based to value-based. The first step in this process was to identify the appropriate elements possessing the greatest influence on the network between biosimilars and the value-based model. These appropriate elements are deemed to be the following: the patient, healthcare providers, health insurance companies, and biosimilar manufacturers all in the context of the U.S. healthcare system. The rationale for determining which relevant stakeholders to include as a part of the application of ANT was based on which stakeholders had the most significant impact on the economic determinants of biosimilar market entry and the provision of value-based healthcare (Cressman, 2018). These stakeholders were identified to play key supportive or detrimental roles towards the notion that biosimilars can promote the practice of value-based healthcare provision. Using ANT, the network between biosimilars and value-based healthcare will be isolated and constrained to a network involving the aforementioned stakeholders (Cressman, 2018). The three primary connections that are investigated in this paper are the following: the influence of insurance companies and biosimilar manufacturers, the relationship between patients and healthcare providers, and the influence placed upon healthcare providers by both insurance companies and biosimilar manufacturers.

Network analysis is used to assess the interactions between these stakeholders and describe how the interactions impact the effect biosimilars may have on a healthcare provider's ability to abide by the value-based model (Wang et. al).

The first of the investigated connections in this network involves assessing how insurance companies wield their power to influence the business and research decisions of biosimilar manufacturers. Due to the fact that insurance companies have dominion over the processes of biosimilar purchase and provider reimbursements administered drugs, the savings on drug costs are held hostage (Brezis, 2008). Biosimilar manufacturers offer discounts to healthcare providers under certain insurance networks in order to grow their market share and gain favor with insurance companies (Mulcahy et. al, 2017). This process allows insurance companies to directly control the settled prices for biosimilars that consumers pay. Insurance companies are not passing down the savings to the consumer that directly accumulate from the substitution of biosimilar drug administration for original reference biologic administration. Instead, they transfer these savings back to healthcare providers who administer treatments in the form of pharmaceutical rebates (Brezis, 2008). Biopharmaceutical companies have no choice but to remain indifferent to this form of cost-sharing as insurance companies also have control over drug availability and administration by providers. Thus, this portion of the network that webs together the relevant key stakeholders serves as a direct barrier to biosimilars achieving the effect of increasing affordability of healthcare.

A similar barrier to progress is also observed when using network analysis to investigate the relationship between healthcare providers and their patients. This relationship builds the foundation for implementing value-based healthcare as successful patient-provider interaction

has been identified as a key necessity for value-based healthcare administration (Frapaise, 2019). In this relationship, literature review showed that most medical care experts hold the provider directly accountable and responsible for implementing value-based healthcare (Gray, 2017). Currently, healthcare organizations and insurance companies shoulder the majority of the blame from the media and experts in healthcare for the failure of the U.S. system to implement a value-based approach. Through investigating the importance of the patient-provider relationship, it was observed that the dynamic aspect of human behavior and the ability of a healthcare system to provide reimbursements for efficient health outcomes can contribute greatly to a provider's incentive and ability to abide by the value-based model (Frapaise, 2019). Healthcare experts have predicted that a significant resistance to implementing the value-based model is an observed static trend in provider behavior and an unwillingness on the behalf of provider's to embrace a new model for healthcare delivery (Nabhan and Feinberg, 2017). The current model already provides more than adequate compensation for providers and the implementation of the value-based model adds a factor of risk towards compensatory practices as providers may not be able meet efficiency standards set by their overarching healthcare organization (Erstad, 2016). Through network analysis, this relationship was identified as a resistive connection rather than one that may have benefitted the overarching goal of utilizing biosimilars to facilitate implementation of the value-based model (Patel et. al, 2018).

The final link, in the isolated network of healthcare that was identified, focused on the mechanisms by which health insurance companies and biopharmaceutical companies exert influence on healthcare providers. Insurance companies engage in the purchase and consolidation of healthcare groups and institutions for the purpose of increasing coverage access to more plan

members, however, this also provides a mechanism for insurance companies to increase control over drug pricing. Through acquisition of independent practices and removal of physician autonomy, a subsequent observation of increased physician burnout has been seen across health insurance companies that participate in this consolidation practice (Beveridge et. al, 2016). Furthermore, to add onto the influence exhibited over healthcare providers, biopharmaceutical companies currently have free reign to communicate and engage with healthcare providers across thousands of healthcare institutions across the United States. This engagement involves the use of corporate funds to provide research funding, gifts, and drug samples without limit to healthcare providers (Fickweiler et. al, 2017). Healthcare economists have investigated and shown providers to react positively to this corporate engagement and soften their stances on corporate influence and mandates over drug prescription requirements (Fickweiler et. al, 2017). Research has also shown that physicians believe their peers are susceptible to influence from engagement with biopharmaceutical companies but that they do not believe these companies have influenced themselves in any way (Brezis, 2008). While benevolent in nature, these influences exerted over healthcare providers prove malignant. The increase in affordability of healthcare established by the use of biosimilars is nullified as patients remain at the mercy of their healthcare providers and those providers remain at the mercy of insurance companies and drug manufacturers (Fickweiler et. al, 2017).

Overall, ANT proved effective in identifying and isolating the complex sphere of U.S. healthcare in that it offers the approach of focusing the scope of network analysis to a few stakeholders. Network analysis,when coupled with literature review, offered more insight into how the major stakeholders interact and how experts on healthcare have demonstrated these

interactions impact U.S. healthcare. Low research and development costs, as well as expedited regulatory approval processes, allow biosimilars to make a quick and cost-efficient entry into the biopharmaceutical market (Choy and Jacobs, 2014). The issue remains that the economic benefits afforded by the use of biosimilars are not being passed down to the patient and are rather being consumed by elements with more power and control over the healthcare delivery process. These institutions include but are not limited to the following: health insurance companies, biopharmaceutical companies, and healthcare providers. The interactions of these higher elements act as economic and behavioral barriers to the implementation of value-based healthcare. As a result, the benefits of biosimilar market entry being utilized as a reinforcement to implementing the value-based model may not be possible with the current standing of the healthcare system in the United States.

While this research project opened doors into further understanding the atmosphere of U.S. healthcare and healthcare provision in general, there is significant room for improvement and expansion of the scope for this project. In order to properly assess the relationships and networks that link the major stakeholders and contributors in the U.S. healthcare system, more concrete statistical data is necessary. The lack of analytic data concerning the connections that were investigated contributed to a partial and incomplete understanding of the network as a whole. The novelty of the research question and broad bridge to be gapped between biosimilars and the value-based model of healthcare also contributed to difficulties in identifying relevant research resources. In addition, biosimilars are a relatively new addition to the U.S. healthcare market with roughly between 5 and 10 years of exposure which resulted in a shortage of longitudinal clinical studies and reports covering their use in the United States. Furthermore, the

market for biopharmaceuticals is constantly changing which creates issues when attempting to analyze the market at one given moment when the experiences of the market are dynamic in nature. The federal and state governments also play pivotal roles for the market in the form of regulatory standards and healthcare policy and with biosimilars being a relatively new concept in the eyes of the U.S., there is a limited number of primary sources assessing governmental roles.

Given these investigative difficulties and shortcomings, there is room for the research project to expand in its scope and address more facets of the U.S. healthcare network. In the future this project could progress in a direction where more resources are analyzed and a larger number of stakeholders are considered through ANT. An increase in the number of stakeholders would assist in developing a more accurate and complete profile on the U.S. healthcare system. Integrating more stakeholders also increases the potential to discover unknown mitigators or exacerbators of the economic and behavioral barriers to the research question. Allowing more time for biosimilars to become a norm in U.S. healthcare may also be a necessity. A longer length of exposure for the U.S. healthcare market to biosimilars will allow for longitudinal studies tracking market dynamics and response to be carried out (Reinisch and Smolen, 2015). Alternatively, further research could also incorporate more statistics and analytical data as they become available over time. While the attempt at bridging two unrelated and novel components of U.S. healthcare in biosimilars and the value-based model is daunting, healthcare systems in other nations have shown us the degree of efficiency and progress that is possible when these two components are utilized cohesively.

Conclusion

Ultimately, the research project provides a look into some of the internal mechanisms driving the U.S. healthcare system. Through fixation upon a few of the key drivers in this system, barriers to integrating biosimilars and value-based model implementation are identified and have shown why the U.S. system has not observed the success that can be found globally. Biosimilars have the potential to integrate efficiently into the U.S. healthcare market and drive a movement towards affordable healthcare but, at the moment, they do not possess the market forces or institutional support to drive U.S. healthcare providers towards implementing the value-based healthcare approach. This research sought to establish that there exists a symbiotic relationship between these two elements of healthcare and that this relationship could contribute to efficient and cost-effective healthcare delivery in the United States. While the investigation performed in this research has deemed this relationship as unsuccessful, the future holds many possibilities for the U.S. healthcare system to grow and learn from the successes of its peers around the world.

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