

An Executive Summary

Big Data, Big Opportunity in Life Sciences



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The role of Big Data in assessing risk and market opportunities for biopharmaceuticals.

“Big Data” is now much more than a buzzword in the life sciences realm. It has become an opportunity to measurably improve the efficiency, effectiveness and financial results of consumer products in pharmaceuticals, biotechnology and medical devices industries as well as for clinical trials management.

Big Data and Life Sciences

Kelly Sborlini, Vertical Market Lead, Life Sciences, and Theresa Greco, VP, Life Sciences, recently discussed the core role of Big Data in assessing risk and market opportunities in the biopharmaceutical arena. They believe Big Data has the potential to eliminate hundreds of billions of dollars of annual costs in the U.S. biopharmaceuticals segment alone. The potential of Big Data in the life sciences market increases as more and more individual health care providers (HCPs) and provider organizations consolidate into even larger and more complex integrated delivery networks (IDNs).

This evolution from individual HCPs to IDNs is also spurring a change from the traditional rep-to-provider sales model to an account-based, business-to-business (B2B) selling model.

Indeed, Big Data is the key to understanding and leveraging the evolving complexities of the B2B world. For instance, some firms may need to identify precise provider and patient targets and market segments. Other organizations may require broader solutions that cross multiple claims areas and multiple therapeutic categories while remaining accessible across the entire enterprise. Big Data can turn needs into opportunities for massive growth and unprecedented success at all levels.

New Tools

LexisNexis®, perhaps best known for its deep data expertise in the legal field, is breaking new ground in the development of Big Data management tools and solutions in life sciences through LexisNexis Health Care. Sborlini and Greco say that LexisNexis Health Care uses the term Big Data to refer to the mushrooming volume of data pertaining to individuals, payers, providers, pharmacies, life sciences and government that is being collected at an ever-growing rate.

Some data types are familiar: medical claims, pharmacy claims, electronic health records, patient registries and the like.

Other data types have rarely or never before been incorporated into the health care decision-making calculus: patient and population lifestyle and socioeconomic factors, recreational activity participation, physical activity and vital signs collected by smart wearables and other



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personal sensors, social media discussions, location and other information from the Internet of Things and far more.

Most biopharmaceutical and health care recognize the significant commercial and intellectual benefits of Big Data. Fully 73% of organizations in the sector plan to expand or launch Big Data investments within the next five years, according to business intelligence firm GBI Research.

But the fundamental properties of Big Data, its volume, velocity, variability and veracity, make it complex to understand and apply. The opportunity is clear, but the new generation of tools that can turn opportunity into success may be unfamiliar to life sciences leaders.

The Big Data opportunity begins with data on a scale that many organizations have never even imagined. LexisNexis has one of the largest databases in life sciences, more than six petabytes with billions of public and proprietary records, all handled with rigorous controls to ensure regulatory and HIPAA compliance.

The reference Provider Data MasterFile™ includes 8.5 million HCPs, more than one million distinct organizations and tens of thousands of relationships among those entities that play an important role in life sciences decision making.

Identify Your Customer

A pervasive problem in health care data management and analytics is correctly identifying the customer who lies at the center of a vast web of data points, and if the customer is a patient, ensuring details de-identified to maintain privacy.

Is Jon Smith the same as John Smith? What about Jonathan Smith? Or Jon Smythe?

Business entities, including biopharmaceutical firms, often use deterministic matching to answer those questions, which requires a match that conforms to business rules. Jon Smith is not the same as John Smith, Jonathan Smith or Jon Smythe.

Another alternative, probabilistic matching allows for more flexibility: Jon Smith may be the same person as Jonathan Smith as other criteria and identifiers are considered.

Big Data offers the potential for stronger identification based on statistical power.

If Jon Smith, Jonathan Smith and Jon Smythe are all associated with the same physical addresses during the same time periods, the odds increase that they are the same person and a statistical confidence score will determine the linkage across records.

LexisNexis applies that kind of statistical power to the limited data sets involved in health care. The result is more clarity and efficiency in delivering the right health care solutions to the right consumer or practitioner at the right time.

Know Your Customer

This rich trove of data also helps users leverage various combinations of medical claims, pharmacy claims, social data, social listening scores, socioeconomic factors, personal activities and more to predict behaviors and outcomes. These

predictive analytics become increasingly important as the focus of life sciences sales and marketing shifts.

The traditional focus has been the individual HCP as the key prescriber, decision maker and customer. Those roles are now increasingly toward IDNs and by patients themselves.

IDNs are focused on improving the effectiveness and efficiency of operations. As IDNs grow by consolidating independent practices and smaller provider organizations, they concentrate buying power with new internal structures and new touchpoints.

Treatment choices and approvals may be based on third-party guidelines or critical pathways designed elsewhere in the organization, by third-party payers, by government regulation or by some combination of players. The opportunity is clear, but decision makers are too often obscured by evolving commercial, decision-making and regulatory structures.

Life sciences organizations are looking for new ways to identify the true decision makers as well as new vehicles to drive partnerships with ever-changing constellations of decision makers. The familiar rep-to-provider sales model is evolving into an account-based, business-to-business model.

Understand Patient Influences

Today's patient is an active, informed participant in the care process. The patient may not decide which medication will be prescribed, but he or she ultimately decides if that medication will actually be taken.

In an era when half of all prescriptions are never filled and barely half of all chronic prescriptions are refilled beyond 12 months, patient adherence and care management have become major areas of focus that may impact health outcomes as well as financial results.

Biopharma manufacturers must be able to predict which patient profiles are more likely to let treatment lapse. In clinical practice, identifying such patient profiles is an opportunity for intervention to improve outcomes. In clinical trials, improving adherence may be the difference between regulatory approval and a failed study.

Big Data allows biopharma manufacturers and clinical research organizations to maximize their knowledge of individual patients and improve projections of adherence.

LexisNexis has identified more than 250 socioeconomic attributes that play a role in eight specific health care targets: total cost, hospitalization, emergency visits, pharmacy costs, medication adherence, stress index severity and percentile and motivation.

Elements such as an individual's FICO score, a license to own a firearm, a license to drive a motorcycle, residence location, vehicle ownership and similar factors are all predictive of particular attitudes or behaviors that can influence adherence and other health-related activities.

The more a biopharma company knows about its patient types and the more powerful the analytics deployed around that data, the more accurately the firm can predict which

patients might benefit from adherence programs and which specific adherence strategies might be most effective.

A patient who needs weekly infusions but does not own a car and lives in an area poorly served by public transportation is less likely to be able to make appointments. Simply providing transportation to appointments could make the difference between adherence and nonadherence, treatment failure and a good clinical outcome.

Big Data forms the core of these predictive analyses. The more the enterprise knows about the patient and the more robust the analysis, the richer the opportunity to intervene to produce a positive outcome.

Reduce Risk

The same data-driven approach eases other concerns such as the risk of violating sunshine provisions. A variety of state and federal regulations require manufacturers to report transfers of value with significant penalties for even inadvertent omissions.

Robust analysis of Big Data helps manufacturers manage and mitigate the risk inherent in transfers that are a routine part of educational and other professional activities.

Transfers of value have two components, the profile of the entity receiving the transfer and the transaction that is the transfer itself. Robust analytics can help ensure that the entity proposed to receive the transfer has the appropriate credentials, licenses, National Provider Identifier, and other qualifications.

Similarly, the ability to authenticate electronic user credentials in real time is growing in importance as cloud-based data repositories with global access become more common. Predictive analytics can significantly improve the rigor of

security protocols that are too often based on passwords that can be less than ideally secure.

Leverage Partnerships

Biopharma has matured in its use of technology and data assets over recent decades. An important element in that maturation is the growing appetite for developing new partnerships.

Just as biopharma has recognized the utility of partnering with contract research organizations to leverage clinical trials expertise, companies are recognizing the advantages of partnering with data specialists to leverage data management and analytics expertise.

In life sciences, LexisNexis Health Care is a strong partner.

Outside partners free up internal resources, allowing the enterprise to focus more fully on its own core business of developing and marketing medically meaningful new treatments.

Outside partners also bring outside perspective, a unique value-add as the pace of evolution and change in life sciences accelerates.

As IDNs continue to drive efficiency and effectiveness through ever-larger organizations, Big Data and predictive analytics will drive the powerful insights that open opportunities for massive growth and unprecedented success in the biopharmaceutical world.

Organizations that ignore the potential of Big Data risk falling behind their peers in an increasingly data-driven and data-intensive world. LexisNexis Health Care provides the tools and the expertise to help you turn the opportunity of Big Data into unprecedented success for your organization.