Analyzing Real-World Data

Generate faster insights to support improved patient health with more effective products and personalized medicines

Business Impact

"Elevating the rigor of trial designs through transparency and sharing of methods and data will become more important. Accommodate diverse evidence needs across stakeholders, define smaller studies based on simple questions and sound research design, and reconsider the delineation between pre- and post-approval process."

A senior executive of an integrated health care plan
February 2018

Challenges

- **Managing and storing complex real-world data.** Vast amounts of data change continuously, are not structured according to a standard data model, and come from different health care systems and contexts.
- **Collaboration among different stakeholders.** Managing and analyzing real-world data requires different skill sets and reports from data managers, statisticians, data scientists, epidemiologists, clinicians and other users from clinical development, health economics and outcomes research, epidemiology and commercial brand teams.
- **Analyzing big data sets.** Real-world data is typically very large, and not in a structure ready for creating and analyzing patient cohorts. Large amounts of new data arrivals make updating analytical and reporting techniques and cohorts difficult.

Pharmaceutical companies, payers, providers and regulatory agencies want to have a more comprehensive view of their patients. But clinical trial data, electronic health records, claims data and adverse event reports are only snapshots of patients at random points in time. To provide real value, a true patient profile is necessary to have the greatest effect on patient health. Today, a primary objective is to better measure a value that the medical product (device, medicine or vaccine) brings to the patient in a real-world setting that is often different than patients participating in randomized clinical trials.

Life sciences organizations are finding real-world data from – and many times partnering with – different providers and sources such as commercial data providers that repackage clinical and financial health care information, disease registries, safety and complaints data, hospital and lab information, wearables device data, physician notes, social media and more. The challenge for pharmaceutical companies is to respond in a timely manner to questions from commercial and brand teams, research and development, regulatory authorities and reimbursement agencies.

The process requires finding the right data source, getting the data in a format that can be queried, and preparing the analytical environment to analyze the large amounts of divergent patient-related data. The scientific and reproducible evidence can be generated – and questions answered based on real-world evidence.

Our Approach

SAS provides a scalable analytics platform that gives statisticians, data scientists, methodologists and quantitatively trained scientists an environment they can trust and easily use. We provide a framework that helps you:

- **Manage data.** Cleanse, standardize, load and integrate real-world data prior to using it.
- **Integrate data stores.** Profile, integrate, cleanse and move data stored in Hadoop or other stores with an intuitive interface that doesn't require coding.
- **Provide access to any user.** Directly interact with complete patient populations, quickly determine feasibility of studies based on the number of patients meeting criteria, and reduce time and resources extracting patient populations interactively using a programming interface (for tech users) or an intuitive "point-and-click" user interface (for business type users).
- **Visualize and analyze cohort data.** Easily explore and gain insight to cohort characteristics and evidence obtained in data and make that accessible for in-memory analysis and visualization in SAS® or other technologies of choice (R, Python third-party visualization tools).

SAS delivers best-in-class data integration and high-performance analytical and visualization capabilities so that users can gain insights across your life sciences organization. Achieve faster time to insight from real-world data to real-world evidence and gain competitive advantage for product development, marketing, market access and commercialization decisions.

The SAS® Difference

SAS gives organizations a means to tap the potential of real-world evidence, aligning the most advanced analytic technologies to collect and derive intelligence using their existing SAS investment.

Data-agnostic. Data optimized for querying reduces the time to build a cohort and speeds time to insight. Collect internal or external data from point-of-care systems, electronic health records, insurance claims, patient-reported outcomes, trusted third-party data providers and others. Develop process automation to map data to a common data model and refresh cohorts and outputs as new data arrives.

Interactive complex cohort discovery. The ability to build and share cohorts, projects and data fosters greater collaboration between users who have programming skills and those who prefer not to program. Identify research cohorts without coding; complex queries can go beyond simple subsetting to selecting criteria with multiple temporal relationships and Boolean logic. Quickly see the effect each inclusion/exclusion criterion has on the patient population to determine study feasibility. Reuse and modify criteria against other real-world data assets to compare across populations, reducing time and improving efficiency.

Advanced analytics. Users can use built-in, transparent analytical models for analysis or incorporate their own SAS (and R) macro libraries to increase access to data, analyses and insights across the organization. Access an analytics library of methodologies that includes simple descriptive statistics, predictive analytics and machine learning methods. Third-party analytics (and visualization tools) work on the defined cohorts.

Visualization. Explore, visualize and report on real-world data sources to generate insights to support decisions.

Speed and agility. Instant response elastic search methodology. Navigate and explore massive data sources with little or no lag time from a point-and-click interface, calculations on millions of rows of data can happen in seconds, rather than minutes, hours or days – all on a single platform.

Case Study

Situation

A pharmaceutical company's marketed product will be losing patent protection in a few years, putting the company at risk of losing its major revenue source. The brand team wants to know how the market value of this product could be extended by identifying new indications and providing more precise care to target patient populations. Therefore, they want to explore claims, laboratory, patient-reported outcomes and social media data to better understand the product's utilization, performance, adherence and preference in addition to studying outcomes in new patient populations.

Solution

Data from numerous sources – including proprietary, commercial and unstructured – was extracted, transformed and loaded into the SAS common data model. Cohorts were generated to identify the right patient subsets to explore, analyze, visualize and report results on the extended SAS platform supporting the entire product's life cycle.

Results

- Marketing teams learn how the product is used by patients and physicians so that it is better positioned before the patent is lost.
- Development teams gain insights about drug effects by looking into the laboratory data and identifying potential new indications or design next-generation clinical trials on follower product categories.
- Statisticians use existing macro libraries with integrated industry-specific analyses to maximize the impact of their scientific and regulatory reports.
- Clinical and scientific teams utilize visual reports that harness the analytic complexity of observational studies for practical clinical insights.

What if you could ...

Improve safety:

Identify sub-populations demonstrating unique risks.

Obtain real-world product insights:

Understand broad population clinical effectiveness, adherence, comparative effectiveness and overall patient outcomes over time.

Improve marketing:

Improve brand planning and position new medicines.

Establish economic value:

Analyze preference and performance data to quantify product/service market value and improve price negotiations.

You can. SAS gives you THE POWER TO KNOW®.

SAS Facts

- SAS solutions are the industry standard for data analysis and reporting in clinical trials.
- For 40 years, life sciences companies have used SAS to derive greater insight from information.
- Our software is installed at more than 83,000 business, government and university sites.

Learn more about SAS software and services for life sciences at sas.com/lifesciences.

To contact your local SAS office, please visit: sas.com/offices