Overcoming Challenges in Registry Studies
Introduction

Registry studies are observational studies designed with specific aim of research question in a target population. Registry studies are gaining prominence in the clinical research industry to answer few of the scientific challenges and also to support a well designed clinical study (Randomized clinical trial). Registry studies also helps in generating disease / condition specific core data, comparative data, supporting data etc for randomized clinical trials.

In a registry study researcher has the freedom to treat with different procedures for a condition rather than a predefined procedure. This is quite in contrast with the clinical studies where the researcher works according to the predefined procedure for a condition.

Registry studies are usually designed with the aim of developing new data base, challenges in new and existing disease/patient information and also to answer research questions. The study designs are intended to collect or compare, update, determine and evaluate the data for a research question. A registry study not only provide the scope for collecting information on existing conditions but also helps in acquiring extra information for the product / condition simultaneously. In short, registry studies are useful in finding clinical effect, regulatory decision making, data resource, safety assessment, study forecast, core data value etc.

Types of Registry Studies:

Patients in a registry study are selected based on condition, risk and outcome or to a specific disease. There are many categories which further has subcategories for a registry studies for different combinations. In general patient registries can be studied under:

1. Patient exposed to a particular product.
2. Patient having a particular disease or condition
3. Various combinations (Either combination of disease or combination of products)

Registry studies are designed in such a way that they should provide high quality data for the existing condition with reasonable utilization of resources.

Data Challenges:

The selection of data elements in a registry study begins with identifying patient / product / disease reported outcomes which are segregated into primary and secondary outcomes. The data variables for an element should support the scientific objective with a core value. The design of data element should always be a “need to know” of importance than “nice to know”.

![Diagram of Data Challenges]

- Size
- Source
- Duration
- Quality of Clinical Data
- Geography
- Cost
Size: This reflects to the number data points selected for a registry. An optimum number of data points should be selected to support the scientific objective of the design. A registry few huge data points will sometimes hinder data analysis and burdensome to the investigators.

Source: This refers to the potential investigator, hospital, community where the data sets are collected for a registry. Duration: The duration of registry will have an impact on data collection. Registry design should be made in such a way that sufficient information is collected for successful analysis of data.

Geography: Management of a Global registry poses greater challenges when compared to a local registry. Constraints may vary from operation of study, data collection, regulatory challenges, language constrains etc.

Cost: The core value of the information obtained in a registry is of more important for the defined scope of the registry. This value should be of financial benefit. The cost incurred in gaining the information should be less than the value of information obtained in the registry.

Quality of Clinical Data: The data obtained should be an asset to the registry and further it should provide scope for new data and scientific rigor.

The quality of clinical data depends on important factors such as:

1) Data selection: The selection of data variables should have importance for the integrity of the registry and for the analysis of primary outcomes, their reliability, their contribution to the registry and the costs incurred with the data collection. Data variables are selected by considering established, validated clinical data tools and definitions. After selecting variables, data mapping should be done and data collection tools have to be pilot tested.

2) Data sources: A single registry may incorporate data from various sources. Data sources can be classified into:
   1. Primary data (Primary data is collected from the objective of the registry)
   2. Secondary data (secondary data is collected along with the primary data which is not uniform in structure and value)

3) Data collection: Monitoring, collecting, proofing and reviewing a registry data is a quite challenging because of huge variables for a data element. All the variables for an element should be properly trained at the resource center (Investigator, hospital, clinic etc.), accurately recorded with a well defined data tool. Developing an integrated system will help in assessing quality of data, handling of missing data, logically inconsistent data and additional data.

Analysis of registry data begins with quality of data collected for an element. Interpretation of data will be effective with completeness of data, procedures for handling missing and incomplete data. Registry data analysis should provide information on characteristics of patient population, the exposure of the element and the registry endpoints.

4) Data handling: Data handling should be defined simultaneously along with designing elements of data in a research. Investigative site is the key area in collecting the elements of data where the confidentiality of the study participant has to be guarded.

The challenges for data collection in a Registry study will be like but not be limited to:

1. Registries done with minimal resources at site level
2. Investigator not having sufficient time to data handling and recording
3. Ethics committee restrictions on third party data collection
4. Ineffective monitoring
5. Untimely quality checks
6. No specific law/regulation on Health Information collection
7. Lack of centralized registry data
8. Protecting privacy and confidentiality of research participant or group etc

5) Sponsor/Researcher: The confidentiality steps in handling data element should be defined in the registry design. The researcher has options in handling the data as:
   1. Key coded data (re-identifiable data)
   2. Partially de-identifiable data
   3. Anonymous data (Non-reidentifiable data)
   4. Identifiable data

6) Investigator: Investigator is made responsible for the safety of physical data and should provide minimal data for interpretation of the results. Anticipation and avoiding misinterpretation of elements at site level will provide quality data for evaluation. Investigator and site staff has to be trained on data handling and has to be supported at the site level as and when required. If the confidentiality must be breached on safety issues, investigator should make an attempt to inform the participants about the breach.

7) Monitoring: Effective monitoring not only in terms of quality of work but also in terms of cost-effective monitoring will decrease the financial burdens for a registry study. Observational studies do not require high frequency of onsite monitoring as of Randomized clinical trials. The frequency of onsite monitoring should be adjusted as the study duration will lost for years together in some registry studies. At the same time reducing the frequency of monitoring visits will hamper the quality of site performance, data collection and data entry.

8) Remote monitoring: Remote monitoring will best fit for a registry study where an experienced CRA will be in touch base via phone with the site for getting study updates. Remote monitoring along with adjusted onsite monitoring visits will keep the pace of project and reinforces timely enrollment, alerting risk issues, identifying potential safety issues, good site relationship and quick tracking of potential problems.

Quality assurance system will help in assuring collection of data elements in a predefined procedure for the registry and meet the required standards of a registry. Hence it is suggested quality assurance should be defined before inception and creation of registry

The data availed in a registry should be legalized for data analysis, exchange and data linking for future registry studies.

Conclusion:
Registry studies are ideal for obtaining effective uniform data (clinical and other) to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure and that serves predetermined scientific, clinical, or policy purpose. Registries allow wide patient selection criteria that include patients with multiple confounding complications, wide age ranges, various socioeconomic backgrounds, and differing healthcare attitude.

Studies derived from well-designed and well-performed patient registries can provide a real world view of clinical practice, patient outcomes, safety, and comparative effectiveness and cost effectiveness, and contributes to scientific credibility.

Registries provide valuable information to clinicians and important data for publications and designing future public health policies. With the growing importance of long term safety and effectiveness of new products lead to the evaluation of products which in turn increased the conduct of registries across the Globe.