VERISTAT

Delivering Data That Matters:

An Integrated Approach to Biostatistics, Data Management & Statistical Programming in Clinical Trials

Biometrics—biostatistics, data management, and statistical programming—is at the core of every clinical trial. Data-driven decisions and the ability to make modifications throughout a trial have become must-haves rather than nice-to-haves due in large part to the growth of innovative trial designs and novel statistical analysis approaches, such as adaptive trials that allow for pre-planned interim adjustments to optimize trial outcomes. Veristat's integrated biometrics specialists, in collaboration with other key clinical and regulatory experts, have been a driving force in applying statistical and data analytics innovations to clinical trials.

In this e-book, you will learn

1. **Key aspects** of the roles that data managers, biostatisticians, and statistical programmers bring to your clinical trial.
2. **The value gained** by partnering with a CRO with integrated expertise in all 3 areas.
3. **How 3 sponsors solved** statistical and data complexities to advance their clinical programs.

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Team Roles

Collecting, Managing, and Interpreting Data to Advance Milestones

Veristat's integrated team members in Biostatistics, Data Management, and Statistical Programming are highly specialized experts who ensure that your clinical trial benefits from high-quality, reliable data. Their work directly impacts the ability to demonstrate or prove the efficacy and safety of your therapy and ultimately regulatory approval.

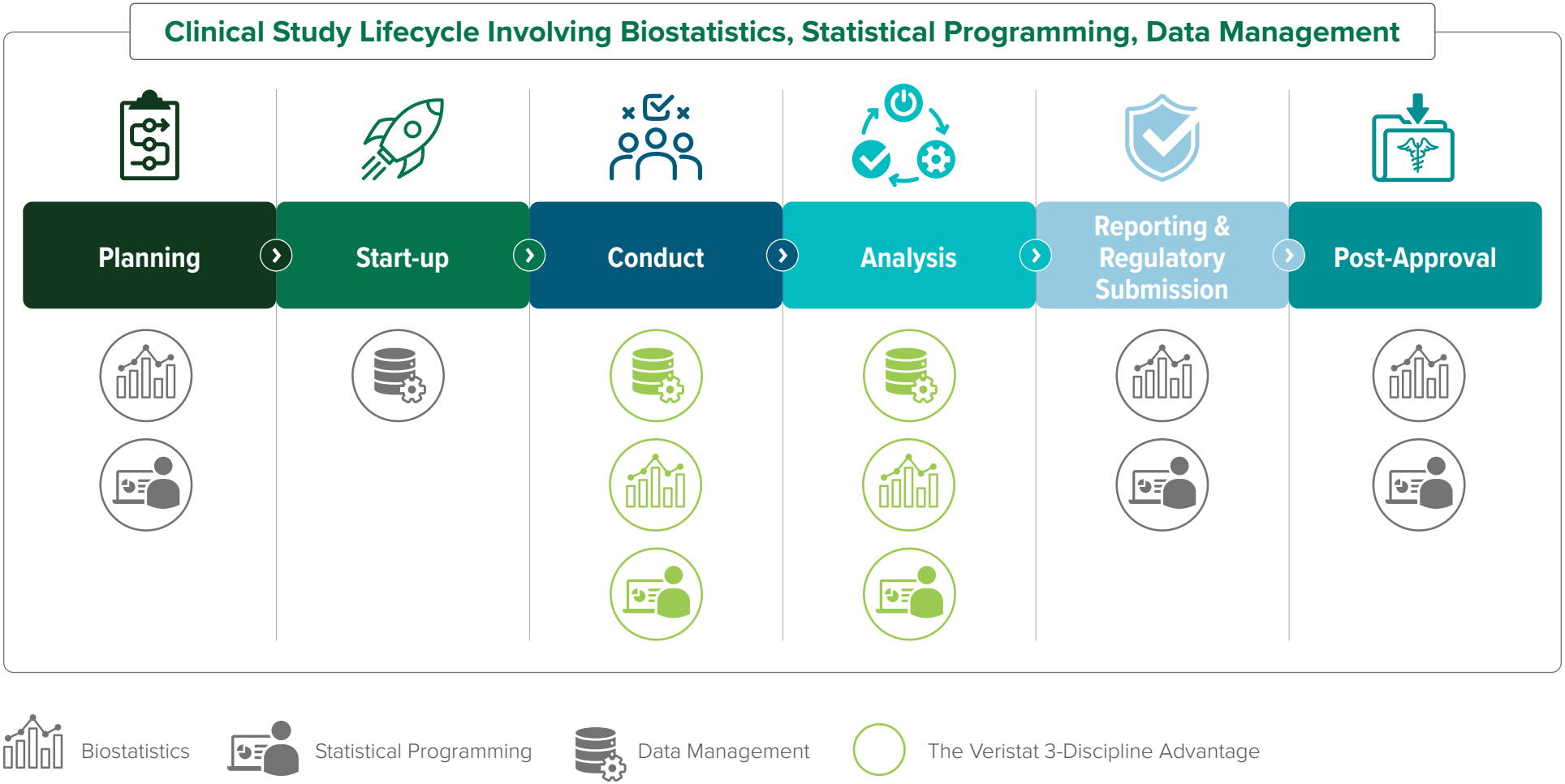
Biostatisticians are experts in statistical methodologies who design and analyze clinical trials to ensure scientifically sound conclusions. They take the lead in providing Data Monitoring Committees (DMCs) with data reports and associated insights to facilitate making key study decisions.

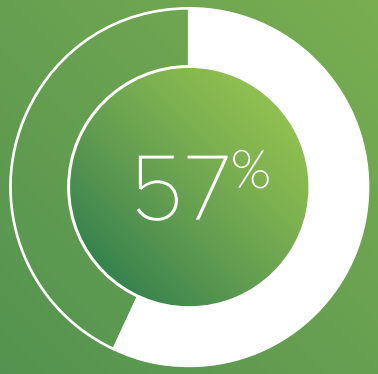
Data Managers oversee the collection, validation, and maintenance of trial data, ensuring accuracy, consistency, and compliance with regulatory standards. They play a critical role in database design, query resolution, and data cleaning, facilitating analysis and study outcomes.

Statistical Programmers implement the analyses outlined in the Statistical Analysis Plan (SAP). They generate tables, listings, and figures that summarize trial data. Their work ensures that data is accurately processed and presented, supporting the biostatisticians in interpreting results and preparing reports for regulatory submissions.

Integrated Biostatistics, Programming & Data Management Across the Clinical Study Lifecycle

Veristat's experienced biostatisticians are involved across the entire clinical development lifecycle—from shaping the Clinical Development Plan and engaging with regulatory authorities to designing studies, participating in Data Monitoring Committees (DMCs), analyzing individual study results, and conducting integrated analyses for regulatory submissions. Partnering closely with statistical programming and data management teams, they ensure each step is scientifically sound and regulatory aligned, driving successful trial outcomes.





Did You Know?

A survey commissioned by Oracle Health Sciences found that **57% of clinical researchers believe their clinical data issues result in trial delays**. The top data challenges identified were duplicate or inconsistent data, data quality, and data integrity/traceability.

Source: Oracle News

Managing Variability in Clinical Trials

"Variability in patient responses is one of the biggest challenges in clinical research. Excessive variability can obscure true treatment effects, making it harder to draw definitive conclusions."

Mark McBride, VP of Global Biostatistics and Programming at Veristat, regularly confronts challenges associated with managing variability and enhancing efficacy signals in clinical trials. In a recent blog, Mark explores some of the key statistical considerations that can impact a trial's outcome, offering insights into strategies that enhance data quality and improve study outcomes.

Read Mark's blog.

Selecting the Right EDC for Your Study

When choosing the right Electronic Data Capture (EDC) system, sponsors must evaluate both short-term and long-term study needs, taking the entire clinical program into consideration rather than just a single study. The selection process requires balancing functionality for clinical users, data output for biometrics teams, cost considerations, and integration capabilities—making early planning essential to maximizing efficiency and cost-effectiveness.

Discover the key factors when selecting your EDC in our blog.

DMC or Not?

Evaluating the Need for Independent Oversight

One of the most common challenges sponsors face is determining whether a DMC is necessary. This decision isn't always straightforward. Sponsors must consider whether they need independent data oversight, what is the level of risk in their study, and whether a DMC would improve the credibility and regulatory acceptance of their trial. Kyle McBride, VP of Biostatistics Consulting at Veristat, discusses the role DMCs play in clinical trials.

Read Kyle's blog.

The Benefits of Working with a CRO That Integrates All Three Disciplines

Veristat's Biostatistics, Data Management, and Statistical Programming team members seamlessly work together, resulting in greater efficiency, accuracy, and compliance for Sponsors:

1 Consistent Data Flow & Quality Control

- With Biostatistics defining the statistical strategy, Veristat's integrated biometrics team ensures that clean, standardized data is collected, validated, and aligned with analysis needs—forming the foundation of a robust clinical evidence package.
- Statistical programming processes and structures the data for analysis ensuring it is submission ready.
- Biostatistics applies rigorous statistical methods to extract meaningful insights and collaborate with Medical Writers on the presentation of the results in the Clinical Study Report.

2 Improved Trial Efficiency

- Early collaboration ensures trial designs are optimized for statistical validity.
- Real-time data cleaning and validation reduce delays in interim review of data by DMC as well as the final analysis.
- Accelerated workflows streamline regulatory submission timelines.

3 Regulatory Compliance & Submission Readiness

- Biostatistics ensures compliance with FDA, EMA, PMDA, and ICH guidelines.
- Data Management maintains audit-ready databases that meet regulatory expectations.
- Statistical Programming generates submission-ready datasets in required formats (e.g., CDISC ADaM and SDTM).

4 Risk Reduction & Data Integrity

- Errors are caught early through integrated data validation and statistical checks.
- Cross-functional communication from the beginning of the study and throughout the entire development lifecycle minimizes inconsistencies and improves trial outcomes.

5 Enhanced Decision-Making & Trial Success

- With accurate data and robust statistical analysis, Veristat's sponsors can make faster, more confident decisions about drug efficacy and safety.
- A well-integrated approach leads to fewer protocol amendments, lower costs, and faster regulatory approval.
- **In a recent video**, Cindy Henderson, Chief Strategy Officer at Veristat, invited members of our Biostatistics and Data Management teams to shed light on the value their integrated work processes bring to delivering reliable, high-quality data to support successful regulatory submissions.

Key Regulations for Clinical Trial Data

Essential FDA, EMA, and PMDA Compliance Requirements

Veristat's biometrics leaders overseeing clinical trials under the U.S. Food and Drug Administration (FDA), the European Medicines Agency (EMA), and Japan's Pharmaceuticals and Medical Devices Agency (PMDA) must ensure compliance with several critical regulations and guidelines to maintain data integrity and ensure the reliability of trial outcomes for our sponsors. Key regulations of note include:

1 Good Clinical Practice (GCP) Guidelines

- **FDA:** The FDA adheres to the International Council for Harmonization's (ICH) E6 guidelines, which outline standards for designing, conducting, recording, and reporting clinical trials.
- **EMA:** The EMA also follows the ICH E6 guidelines, ensuring that clinical trials within the European Union meet consistent quality and ethical standards.
- **PMDA:** Japan's PMDA aligns with ICH guidelines, emphasizing the importance of GCP in clinical trials to protect participants and ensure data credibility.

2 Electronic Records and Signatures

- **FDA's 21 CFR Part 11:** This regulation establishes criteria under which electronic records and signatures are considered trustworthy and equivalent to paper records and handwritten signatures. Compliance ensures the integrity and reliability of electronic data.
- **EMA and PMDA:** Both agencies emphasize data integrity in electronic records, requiring systems that ensure accuracy, reliability, and consistent intended performance.

3 Statistical Principles for Clinical Trials

- **ICH E9 Guidelines:** These guidelines provide a framework for the design, conduct, analysis, and evaluation of clinical trials, focusing on statistical principles to ensure credible and reliable results. Both the FDA and EMA have adopted these guidelines.

4 Data Standards for Regulatory Submissions

- **CDISC Standards:** The Clinical Data Interchange Standards Consortium (CDISC) provides standardized data formats, such as the Study Data Tabulation Model (SDTM), to streamline data submissions. The FDA and PMDA require the use of CDISC standards for electronic submissions to facilitate efficient regulatory review.

5 Software Validation and Compliance

- **FDA Guidance on Statistical Software:** The FDA does not mandate specific software for statistical analyses but expects that the software used is validated and documented appropriately to ensure the accuracy and reliability of analyses.

Adherence to these—and all applicable regulations and guidelines—is essential for the ethical conduct of clinical trials and the credibility of the data collected.

Non-compliance can lead to regulatory actions, including the rejection of trial data or denial of marketing authorization.

Case Studies

How Veristat's Biometrics Experts Overcame Trial Challenges and Helped Secure Regulatory Approvals

1 Supporting a Sponsor from SPA Rejection to BLA Submission

Veristat guided a biopharmaceutical company from FDA rejection of their Special Protocol Assessment (SPA) through revision of their trial design and statistical analysis to SPA approval, enabling the Phase III pivotal trial followed by a successful regulatory approval. Prior to Veristat's involvement, the SPA was missing clearly defined endpoints and had a 'missing data problem' that could skew the study results. Our solution? Modify the study protocol and statistical analysis plan to clearly define the endpoints and analysis methods, and to plan a trimmed means approach to reduce bias and strengthen statistical accuracy. Our collaboration with the sponsor expanded, leading to the preparation of an Integrated Summary of Safety (ISS) for the sponsor's Biologics License Application (BLA). **Learn more ›**

2 Gaining Regulatory Approval Following a Single-Arm Phase I/II Study

Veristat helped our biotech sponsor secure FDA and EMA approval for a novel biologic treating an ultra-rare hematologic malignancy. Veristat recommended a meeting with the FDA, and together with our sponsor, we presented the study results and discussed the submission strategy. Following that meeting, the FDA recommended adding a prospectively designed confirmatory cohort. Veristat led the design and analysis of this cohort, aligning with regulatory expectations. With our integrated support across biostatistics, programming, and medical writing, the submission was successful—resulting in approval and further development in new indications. **Learn more ›**

3 Understanding and Operationalizing a Complex Adaptive Design

Veristat helped our biopharmaceutical sponsor navigate the complexities of an adaptive Phase II trial for a promising cancer vaccine. Due to the efforts of our biostatistics team and their ability to explain the study to the FDA, EMA and Japan PMDA, the study received approval to start across 65 sites in 14 countries, enrolling 300+ patients throughout North America, Europe, and Japan. Our project teams implemented the design, and the study ran smoothly until the first interim analysis. The adaptive design quickly led to a go/no-go decision, allowing the sponsor to reallocate resources toward developing the vaccine for other cancers. **Learn more ›**

3 Key Considerations for Study Success

1 Study Design

Carefully design the study protocol, including the primary and secondary endpoints, randomization procedures, and the statistical analysis plan, to ensure the trial effectively answers the research question.

2 Sample Size Calculation

Conduct a power analysis to determine the appropriate sample size needed to detect a clinically meaningful difference between treatment groups, maximizing the chance of obtaining statistically significant results.

3 Data Collection and Validation

Involve all stakeholders in the design of the study database in EDC and the corresponding validation rules, ensuring alignment with objectives. Develop robust data management processes to collect, clean and validate all data necessary for analysis.

Learn how Veristat Biometrics Experts Think Ahead to Navigate Clinical Complexity

Veristat's Biometrics teams leverage industry-leading technology and expertise across all trial phases to ensure your data is properly collected, standardized, analyzed, overseen, and reported.

Explore our Biostatistics Services

Explore our Data Management Services

Explore our Statistical Programming Services

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Additional Resources

The Right Track for Data Management Success
Database Design Considerations
Migration of Data Between EDCs
Biostatisticians: Ensuring the validity, reliability, and interpretability of clinical trial data
Adaptive Design Fact Sheet
Navigating Clinical Trials with Precision: Enhancing DMC Services Through Veristat's Expert Biostatistics
Understanding Data Monitoring Committees

Meet Veristat

The Global CRO and Consultancy that Accelerates Success

Contact us to learn how our biometrics expertise can help you make informed clinical development decisions and achieve regulatory success.

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