

Biostatistician Competency Matrix

Competency Area	Competency	Entry Level	Mid Level	Advanced Level
Statistical Theory & Methods	Understanding and applying statistical concepts in life sciences and clinical research.	Understands basic statistical concepts and can perform standard tests.	Applies advanced statistical methods and interprets complex data.	Develops new statistical methodologies and advises on experimental design.
Data Management	Handling biological, clinical, and agricultural datasets.	Performs basic data entry and ensures accuracy.	Cleans, organizes, and validates large datasets for analysis.	Designs data management systems and ensures data integrity across studies.
Clinical & Experimental Design	Designing trials, experiments, and studies.	Understands basics of study design and sample size calculations.	Designs experiments and clinical trials independently, applies randomization methods.	Advises on multi-site, multinational trials and advanced adaptive designs.
Software & Programming	Using statistical software and programming for analysis.	Uses software like Excel, R, or SAS for basic analyses.	Writes scripts and programs in R, Python, SAS for advanced statistical modeling.	Develops custom algorithms and statistical tools for specialized applications.
Biostatistical Analysis	Analyzing data from biological and clinical studies.	Conducts standard statistical tests (t-tests, chi-square, ANOVA).	Performs regression, survival analysis, mixed models, and Bayesian analysis.	Leads analysis of complex datasets, develops novel models and simulations.
Regulatory & Compliance Knowledge	Understanding requirements for statistical reporting in regulated industries.	Understands basic statistical reporting standards (GCP, ICH).	Prepares statistical sections for regulatory submissions (FDA, EMA).	Advises on regulatory strategy, leads statistical interactions with regulators.
Communication & Collaboration	Working with cross-functional teams to interpret and share results.	Prepares simple reports and presents results under supervision.	Communicates statistical findings clearly to non-statistical audiences.	Leads cross-functional collaborations, presents to executives and regulators.
Research & Innovation	Contributing to scientific discovery and publication.	Supports research projects with basic statistical input.	Publishes results, co-authors scientific papers, applies advanced models.	Leads statistical research, develops innovative approaches, publishes in high-impact journals.