**DS&AS**

**Overview**

Our **Data Science & Analytics Section (DS&AS)** has a much broader role than just data cleaning and analysis; it is a **strategic research enabler.**

**Here are the main roles of the section:**

* **Policy & strategy support** (analytics-related guidelines, standards, review).
* **Applied statistical and data science support** (design, analysis, reporting).
* **Data governance** (safeguarding, workflows, database management, compliance).
* **Monitoring & evaluation** (of projects, disease programs, interventions).
* **Specialized research** (epidemiology, bioinformatics, genomics, computational tools, machine learning, predictive modelling).
* **Capacity building** (training, mentorship, dissemination).

**Given these roles, the section SOPs need to ensure that:**

1. **Every role has an SOP backbone** to clear any ambiguity in how the section delivers.
2. **Every project has an SAP** (Statistical Analysis Plan) as part of its lifecycle, since analysis is central to most of section functions.
3. **Compliance and reproducibility** are embedded (so data handling, modelling, genomic analysis, and reporting are auditable).

**Core Domains for the SOPs**

1. **Policy & Strategy Support SOPs**
   * SOP on developing, reviewing, and updating data analytics policies/strategies.
   * SOP on aligning DS&AS processes with institutional/national regulations (Data Protection Act, ethical approvals, etc.).
2. **Research Study Support SOPs**
   * SOP on study design and statistical consultation.
   * SOP on **Statistical Analysis Plans (SAPs)** (pre-specified, version-controlled, and approved).
   * SOP on reporting research results (Word, Latex/Overleaf tables/PDF, figures, dashboards).
3. **Data Governance & Security SOPs**
   * Data access and authentication procedures.
   * Data storage, backup, encryption, and disaster recovery.
   * Database and workflow management.
   * SOP on data sharing, anonymisation, and compliance.
4. **Monitoring & Evaluation SOPs**
   * SOP on project performance monitoring (M&E framework, KPIs).
   * SOP on evaluating disease control programs (epidemiological and cost-effectiveness frameworks).
5. **Bioinformatics & Computational Biology SOPs**
   * SOP on genome and proteome data management.
   * SOP on bioinformatics pipelines (from raw sequence data to analysis).
   * SOP on development and validation of computational tools.
6. **Statistical Modelling & Machine Learning SOPs**
   * SOP on predictive modelling and ensemble modelling.
   * SOP on handling large datasets and trend detection.
   * SOP on reproducible coding practices (Git, R Markdown, Jupyter, etc.).
7. **Capacity Building & Dissemination SOPs**
   * SOP on training/mentorship delivery.
   * SOP on scientific dissemination (conferences, workshops, publications).
8. **Data Collection & Capture**
   * Covers survey instruments, field/lab measurements, electronic data capture, cameras, biometric tools, REDCap, ODK, CSPro, Excel, and other relevant tools.
9. **Data Cleaning & Preprocessing**
   * Standard procedures for cleaning, deduplicating, validating, and preparing datasets for analysis.
10. **Data Integration & Harmonization**
    * Guidelines for linking multiple datasets, reconciling formats, and ensuring consistent variable definitions.
11. **Ethics & Regulatory Compliance**
    * Covers ethical approvals, informed consent tracking, and regulatory reporting for all DS&AS research projects.
12. **Data Retention, Archival & Secure Disposal**
    * Procedures for long-term storage, archival policies, and secure deletion of datasets in line with institutional and regulatory standards.
13. **Automated Reporting & Dashboards**
    * SOP for generating real-time or periodic reports, dashboards, and visualizations for projects or institutional monitoring.