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|  | **SOP Title:** General Operating Procedure for Data Management |
| **Study title**: *Give study title to which this SOP applies* |

1. Scope and application

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| Data Management (DM) is a key area within scientific research to ensure reliable and robust data. Its variety of processes and activities stretches from the initiation of a project/study up until analysis, publication and data sharing.However, the perspective towards DM might differ amongst the stakeholders of a project/study. Not all DM processes and activities are always considered or are even unknown and therefore might lead to underestimating of resources, non-adherence to timelines and quality issues. To ensure proper conduct of a project/study all aspects of DM should be clearly identified.This SOP applies to all key aspects involved in the successful planning, organizing, execution and completion of data management, in particular for a clinical research project/study. |

1. Responsibilities

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| **Function** | **Activities** |
| CoordinatingInvestigator orProject Lead | * Overall project management
* Supervision of the project
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| Project Lead delegate | * Day to day project management
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| Principal Investigator | * Project management at site
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| Data Manager (Central) | * Overall DM
* Responsible for designing DMP, CRF and other relevant DM documentation and tools
* Responsible representative for DM at the TMG meetings
* Informs the Coordinating Investigator or Project Lead and other study team members on timelines, deliverables and possible issues of DM
* Supervision of the site data manager(s)
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| Data Manager (Site) | * DM at site
* Interacts with the Principal Investigator (site) and with the central Data Manager
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1. Definitions

**Clinical trial/study:** Any investigation in human subjects intended to discover or verify the clinical, pharmacological and/or other pharmacodynamic effects of an investigational product(s), and/or to identify any adverse reactions to an investigational product(s), and/or to study absorption, distribution, metabolism, and excretion of an investigational product(s) with the object of ascertaining its safety and/or efficacy. In Good Clinical Practice, the terms clinical trial and clinical study are defined synonymous.

**Coordinating Investigator:** An investigator assigned the responsibility for the coordination of investigators at different centres participating in a multicentre trial.

**DB**: Database

**DM**: Data Management

**DMP**: Data Management Plan

**DMR**: Data Management Report

**EVD**: Ebola Virus Disease

**Gantt Chart**: is a project management tool, to visually view project tasks and deliverables over time.

**Good Clinical Practice (GCP):** A standard for the design, conduct, performance, monitoring, auditing, recording, analysis, and reporting of clinical trials that provides assurance that the data and reported results are credible and accurate, and that the rights, integrity, and confidentiality of trial subjects are protected.

**Medical Coder:** Aperson responsible for medical coding

**Medical Coding:**is the process of coding medical terms such as Adverse events and Medical history to a standardized format.

**Monitor:** A person overseeing the progress of a clinical trial, and of ensuring that it is conducted, recorded, and reported in accordance with the protocol, Standard Operating Procedures (SOPs), Good Clinical Practice (GCP), and the applicable regulatory requirement(s).

**Principal Investigator (PI)**: A person responsible for the conduct of the clinical trial at a trial site. If a trial is conducted by a team of individuals at a trial site, the investigator is the responsible leader of the team and may be called the principal investigator. See also Sub-investigator.

**Quality Assurance (QA):** All planned and systematic actions that are established to ensure that the trial is performed and the data are generated, documented (recorded), and reported in compliance with Good Clinical Practice (GCP) and the applicable regulatory requirement(s).

**SOP**: Standard Operating Procedure. Detailed, written instructions to achieve uniformity of the performance of a specific function.

**Source Data**: All information, in original records and certified copies of original records, of clinical findings, observations, or other activities in a clinical trial necessary for the reconstruction and evaluation of the trial. Source data are contained in source documents (original records or certified copies).

**Source Documents (SD):** Original documents, data, and records (e.g., hospital records, clinical and office charts, laboratory notes, memoranda, subjects' diaries or evaluation checklists, pharmacy dispensing records, recorded data from automated instruments, copies or transcriptions certified after verification as being accurate copies, microfiches, photographic negatives, microfilm or magnetic media, x-rays, subject files, and records kept at the pharmacy, at the laboratories and at medico-technical departments involved in the clinical trial).

**Sponsor**: An individual, company, institution, or organization which takes responsibility for the initiation, management, and/or financing of a clinical trial

**Sub-investigator:** Any individual member of the clinical trial team designated and supervised by the investigator at a trial site to perform critical trial-related procedures and/or to make important trial-related decisions

1. Procedures
	1. Pre-Study Phase

#### **4.1.1. Project Initiation: defining of the research proposal and its DM aspects**

#### **4.1.1.1 Assigning DM roles**

* Identify all stakeholders within the project/study and their roles and responsibilities. Assess this for DM and for all areas related to DM (Project Management; IT; Statistics; Laboratory; QA).
* Assign (a) study data manager(s). Differentiate, if applicable, between a central data manager (e.g. at the DM coordinating centre or at the sponsor) and site data manager(s). (see example for a possible Data Manager profile description in Attachment 01)
* Assign other study DM roles such as Data Entry Clerk(s), Data Reviewer(s), DB programmer(s); Monitor(s), Medical Coder etc.
* Integrate **DM role(s)** within an established project management structure (see example in Attachment 02).
* Identify all DM aspects as early as possible in the pre-study phase, before finalizing the study protocol.
* Look at DM of the project/study in a broad sense. Essentially 4 areas should be considered:

1. Clinical Research Data Management: concepts and processes

2. Regulations, guidelines, standards and funder requirements

3. Information Technology

4. Project Management: in particular for DM

#### **4.1.1.2 Pre-study DM Checklist**

* Make a **checklist for DM aspects**, which should be approved by the Coordinating Investigator or Project Lead and/or Project Lead delegate in agreement with the Data Manager (see example in Attachment 03).
* Ensure sufficient resources, personnel and budget.

#### **4.1.2 Project planning & organization: project/study setup and its DM aspects**

#### **4.1.2.1 Preparing of the DM Gantt chart**

The Data Manager will :

* Plan all tasks, deliverables and timelines with reference to DM. Proceed best with the following 2 tools:
* Create a ‘**work breakdown structure’** for the DM of the project/study, by refining the total scope of the work into smaller manageable components, tasks and deliverables (e.g. the task ‘Prepare a study database’ might be broken down in various (sub) tasks and deliverables such as 1. Study database design, 2. Study database development, 3. Programming, 4. System validation, 5. Training)**.** This way of thinking will help better to define all work that needs to be done, in particular with reference to costs (resources), timelines and by assigning responsibilities (see example in Attachment 04).
* Develop a **Gantt chart** in particular on DM, which visualizes the DM tasks and deliverables on a timescale, (see example in Attachment 05).

#### **4.1.2.2 Preparing of the DMP**

The Data Manager will (with approval by Coordinating Investigator, Project Lead or Lead delegate):

* Prepare the DMP, with help of the checklist for DM aspects, DM work breakdown structure and/or Gantt chart. The DMP will be in accordance with the SOP-WP3-04-DMP and the template attached to that SOP, unless it is requested otherwise (e.g. funders might require to use their DMP template).
* Make sure that the following 4 areas are well considered for the project/study DM and the DMP:

4.1.2.2.1 Clinical Research Data Management: concepts and processes

* Define the measures for data integrity, quality, confidentiality and security
* Define which processes and procedures should be included:



4.1.2.2.2 Regulations, guidelines, standards

Adhere to the following (if applicable):

* Regulations:
	+ EU Regulation EU No 536/2014 for clinical trials
	+ EU General Data Protection Regulation (GDPR) on data protection and privacy of individuals
	+ FDA 21 CFR part 11 on electronic records and electronic signatures
	+ Any relevant local legislation
* Clinical Research related guidelines and standards:
	+ ICH - Good Clinical Practice (GCP)
	+ WHO - Good Clinical Laboratory Practice (GCLP)
	+ Clinical Data Interchange Standards Consortium (CDISC) standards such as CDASH, SDTM and Operational Data Model (ODM)-XML.
	+ Medical Dictionary for Regulatory Activities (MedDRA) for standardizing medical adverse events
	+ WHO drug dictionary for classification of medicines
* Project related regulations and guidelines:
	+ EDCTP2 policy on clinical trials registration, publication and data sharing (promoted by EDCTP)
	+ PANDORA – ALERRT data sharing principles (produced as a deliverable on March 2019) (promoted by ALERRT)
	+ FAIR guiding principles for scientific data management and stewardship  (promoted by Horizon 2020 and EDCTP)
	+ Etc.

4.1.2.2.3 IT

Choose the appropriate software and hardware for collecting, managing and handling your product/study data. Amongst others, your choice could depend on:

* User Friendliness at data collection/entry level
* User Friendliness at design level
* Compliance to regulations and standards (see 4.1.2.2.2)
* Mobile data capture
* Possible offline data capture
* System Management features
* Security features
* Import/export features
* Special features: medical coding/integrated query resolution/archiving etc.)
* Licence (commercial vs open source)
* Price (cost vs free)
* Technical support (vendor vs community vs none)

4.1.2.3.4 Project Management

* Create awareness on the central role DM has in research
* Ensure compliance to the DMP (see 4.1.2.2) and all relevant DM & IT SOPs (see Attachment 06)
* Assess possible risks with reference to DM and anticipate with appropriate measures. These might include offline data entry, use of portable servers, local wireless network, reliable power supply and standby generators.
* Assign appropriate DM role(s) (see also 4.1.2.1) at central level (sponsor) and at site(s).
* Assign an IT helpdesk
* Implement appropriate communication by
	+ Appointing focal point(s) for DM and IT at central level (sponsor) and at site(s)
	+ Regular meetings at TMG or DM level
	+ Inclusion of the Data Manager at the TMG
	+ Meeting Minutes
* Prepare TMF (paper/electronic) at central level (sponsor) and at site(s) in particular prepare the DM documentation needed for the Pre-study, Study and Post study (see list of possible DM documentation in Attachment 07)
* Prepare a DM Contact Log file with name, function/role, email, phone number.
* Prepare DM policies (if applicable)
	1. Study Phase

#### **4.2.1 Project execution:**

The Data Manager will:

* Ensure compliance to the DMP and all relevant Study phase DM SOPs
* Communicate the project/study progress at the regular TMG or DM meetings
* See to it that possible DM issues or risks are communicated towards the Coordinating Investigator or Project Lead? Project Lead delegate and other stakeholders where applicable (IT, Monitor(s), Laboratory, QA, Statistician, Sites Management)
* Document any relevant changes in DM on the study/project in meeting minutes or in an updated DMP.

	1. Post-Study Phase

#### **4.3.1 Project closure:**

The Data Manager will:

* Ensure compliance to the DMP and all relevant Post-Study phase DM SOPs.
* Make a Data Management Report (DMR): this document will list the information from the DMP, with deviations and possible additional information. See also SOP-WP3-14-Data Management Report.
* Communicate deviations which have impact on the analysis of the study/project to the Coordinating Investigator or Project Lead, Project Lead delegate and Statistician before analysis.
	1. Public Health Emergencies & Outbreak Research

#### **4.4.1 Rapid Response**

**Background**: Patient-based research during outbreaks and epidemics is challenging, with time as a main constraint.

The Coordinating Investigator or Project Lead and/or Project Lead delegate will:

* Consider the information and instructions mentioned in 4.1, 4.2 and 4.3 and:
* Mobilize a multidisciplinary team
* Use qualified staff and experts
* Organize training/re-training in the specific study areas where needed
* Make use of a readily available pre-filled study protocol and other study templates
* Closely follow up on study progress
* Aim for a rapid response

The Data Manager will:

* Consider the information and instructions mentioned in 4.1, 4.2 and 4.3
* Focus on a timely approach, ensuring the highest data quality level feasible and comply to applicable regulations and guidelines (e.g. GCP; FDA 21 CFR Part 11)
* Make use of a prepared and readily available pre-filled DMP (see Attachment 08)
* Enhance the use of a library of existing CRFs, templates and DM documents
* Advocate to limit data points and keep number of study participants to a strict minimum
* Ensure that database development and system validation is done before study start (= first visit from first patient)
* Raise awareness on the **need for a timely database lock**, preferably to be accomplished within days, after the study end (= last visit from last patient).
* Provide data for sharing as soon as possible, but without jeopardizing the scientific integrity and value of the research
* Ensure anonymizing of study data before sharing

#### **4.4.2 Type of disease**

**Background**: The type of disease of the outbreak or emergency might influence on how a project/study, in particular DM, is handled. Although specific information and instructions for the various diseases are out of scope here, this SOP would like to consider the Viral Hemorrhagic Fever (VHF) diseases and some of its particularities on DM handling.

**Viral Hemorrhagic Fever diseases**

Background: Research on VHF diseases, such as Ebola and Marburg virus disease pose specific challenges on data collection and data handling at the treatment center. These might include:

* Personal protective equipment (PPE) used by the staff involved in care and/or research, such as the heavy-duty hand gloves pose a challenge to collect or enter data.
* Time constraints to perform research. Medical staff are allowed in the high-risk zone of the treatment center for a limited time. As time is prioritized for giving care to patients and for obligatory procedures such as using the PPE and cleaning specific equipment, time left over for research is restricted.
* Paper and electronic tools are potentially infected and not allowed to be handed over from the high-risk zone to the low risk zone.
* Disinfectants used for cleaning regularly patient rooms, surfaces and equipment might have a corrosive effect on data collection and management devices and hardware.

The Data Manager will:

* Consider the information and instructions mentioned in 4.1, 4.2 and 4.3 and also:
* Assess and adapt the best DM strategy and IT for data collection and further data handling:
	+ When using paper data collection, then adequate data transfer to the low risk zone has to be organized for data entry and further data handling. Data transfer methods by organizations have been varying from ‘over the fence shouting or prescriptions’, ‘radio transmission’, faxing, sending scanned or photographed source documents through a local network.
	+ When using electronic data collection, then the above feasibilities have to be considered, such as collecting data when wearing PPE and using heavy duty hand gloves and the possible damage of disinfection to DM equipment.
	+ Take well into account the possible risks and compromises on data integrity, quality, confidentiality and security.
1. Attachments

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| **Attachments** |
| **Number** | **Title** |
| 01 | Example for a possible Data Manager profile description |
| 02 | Example of DM Roles |
| 03 | Example of DM Requirements Checklist |
| 04 | Example of Work Breakdown Structure |
| 05 | Example of DM Gantt Chart |
| 06 | List of relevant DM & IT SOPs |
| 07 | List of possible DM & IT documentation |
| 08 | Sample DMP |
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6. Document History and References

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| **Revision**  |
| **Version number** | **Author** | **Date** | **Description/reason for modification** |
| 1.0 | Harry van Loen | 03/10/2019 | Initial versionReview by Fatoumatta Cole, Hanne Landuyt and Yusupha Njie.Approval by Bai Lamin Dondeh. |
| 2.0 | Harry van Loen | 20/06/2022 | Review to ensure that the SOP is appropriate within ALERRT and with current clinical research best pratices. |

7. Approval

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| --- | --- | --- |
| **Name and function** | **Date (dd/mm/yyyy)** | **Signature** |
| ***Author*** |
| *Indicate who wrote the SOP* |  |  |
| ***Review*** |
| *Indicate WP team members who reviewed (if applicable)* | *Date of review* |  |
| ***Approval*** |
| *Indicate WP Lead/Co-lead(s) who approved* | *Date of approval* |  |