

TRAINERS

Planning for

SUCCESS

Effective project planning and evaluation in biomedical research

STEP-BY-STEP GUIDE



World Health
Organization

Special Programme for Research & Training
in Tropical Diseases (TDR) sponsored by
UNICEF/UNDP/World Bank/WHO



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About the step-by-step guide

The skill-building course in *Effective project planning and evaluation in biomedical research* has been developed by the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR) for biomedical researchers in developing countries. Its aim is to strengthen their skills in the organization and management of research projects so as to achieve effective implementation and successful collaboration and this way increase competitiveness in accessing available funding.

During the four-day course participants work on their own project and go through the various steps of project management. They carefully define and analyse their project, and establish a complete project development plan. They understand how to use the plan first to implement the project on time, under a given budget and within agreed standards, and then to monitor, evaluate and report. The value of teamwork and its processes is highlighted and discussed.

The train-the-trainer course, developed in collaboration with the South African Medical Research Council, Cape Town, South Africa, ensures that competent trainers are available to facilitate the integration of the skill-building course in developing countries.

The support training material for these interactive courses includes the following five handbooks:

- › *Training manual for participants*
- › *Step-by-step guide for participants*
- › *Training manual for trainers*
- › *Step-by-step guide for trainers*
- › *Train-the-trainer manual*

The present handbook is the *Step-by-step guide for trainers*. It has the same content as the *Step-by-step guide for participants*, taking participants through each phase of the project planning and evaluation process (modules 3 to 5 of the course). In addition, practical tips for trainers are provided. These tips are presented chronologically, as the trainer guides the participants through the various steps described in modules 3, 4 and 5. Time management and general facilitation tips are provided at the beginning of this guide. These tips are only suggestions and should NOT, in any circumstances, limit the flexibility and creativity of trainers in reaching the course objectives.

Objectives and principles

Training objectives

The training programme aims to strengthen the skills of biomedical researchers in developing countries in the areas of organization and management of their projects so as to achieve successful implementation and collaboration as well as increased competitiveness in accessing funding.

The course helps participants to:

- consider and understand the value of project planning and evaluation
- strengthen their skills in project planning and evaluation
- apply these skills to everyday work.

Objectives of planning and evaluation activities

An effective plan gives a clear vision of the project including what needs to be done, the standards to which it should be carried out, who will do it, when, how much it will cost, and who pays for it.

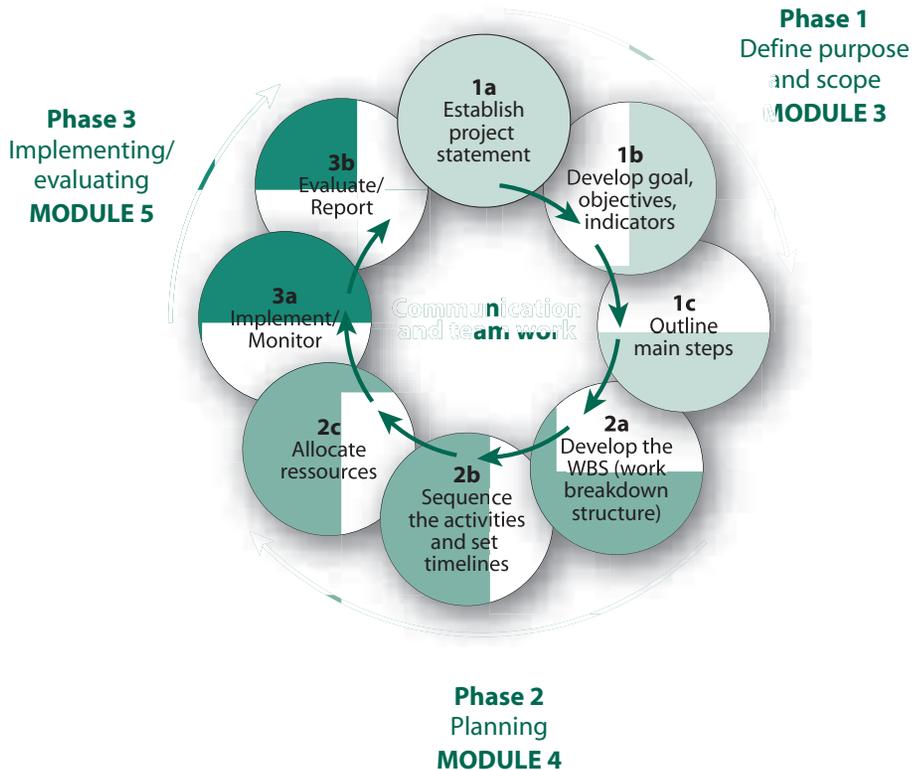
It aims to:

- ensure the project has common goal and objectives
- ensure a clear understanding of the development process
- facilitate the anticipation, identification and addressing of potential logistic issues
- enhance communication, coordination, teamwork and ownership
- facilitate systematic project monitoring and reporting
- facilitate clear project evaluation.

Key principles

- always use common sense
- stay flexible and adapt to the situation
- keep in mind the objectives of planning and evaluation
- remember that the plan is dynamic and needs to be revised regularly
- keep it simple.

The project planning and evaluation process





Time management for case study sessions

For the trainer's guidance, some timelines are suggested below. The case study activities are conducted in steps, and it is essential to complete one step before going on to the next. Stay flexible and try to adapt to the participants' pace, yet ensure that all steps will have been completed by the end of the course. You may give more help to the groups that work more slowly.

The suggested times below refer to *working group time + presentation and discussion time* for each case study session. Each period corresponds to four working hours (a.m. or p.m.).

Module 3 – case study

- PHASE 1 A: 45 min + 60 min (2nd period)
- PHASE 1 B: 60 min + 2 hours (2nd & 3rd periods)
- PHASE 1 C: 30 min + 45 min (3rd period)

Module 4 – case study

- PHASE 2 A, B & C: Gantt CHART – 7 hours (4th & 5th periods)
PERT CHART – 3 hours 30 min (6th period)
- Presentations and discussions in plenary session of Gantt **and** PERT charts:
1 hour 30 min (6th & 7th periods)

Module 5 – case study

- PHASE 3 A & B: 90 min + 90 min (7th period)

General tips for facilitating case study activities

Ensure participants understand how the case study sessions work

- › Case study activities make up ~ 80% of the course.
- › Participants work in groups of 2-3 persons. Four groups are formed, each of them working on a different project. Each group should have one computer with *Microsoft PowerPoint* and *Microsoft Project* software installed.
- › All case studies are completed in a stepwise fashion and it is essential to complete one step before moving on to the next.
- › Ask participants to follow the various steps described in the *Step-by-step guide* carefully.
- › Explain that each group will present its work to the others after each step or session.
- › Emphasize that the discussions that follow the presentations are essential. They allow participants to learn from their own experience of working on their project and also to learn from the other participants' experiences.
- › Groups should enter their work directly on the computer.

Ensure participants are provided with the appropriate materials

- › As appropriate, provide the groups with computer diskettes, CDs, USB devices, flipchart and pens.

Encourage participants and make them feel confident

- › Praise them as appropriate.
- › Emphasize and repeat if necessary that this work is more difficult than it first appears.
- › Keep repeating that they should:
 - first understand before they follow the steps described
 - follow what makes sense to them
 - keep it simple
 - adapt methodology to their own situation
 - remember that there are **several** ways of doing things.

Facilitate the group work sessions

- › As participants work in their groups, **circulate and check on their progress** – this will allow you to:
 - manage the time better

- become familiar with what the participants will present and therefore prepare yourself for the discussion sessions
- guide the groups appropriately, i.e. not too much and not too little – give them some direction if required – do not do the exercise for them but you could challenge them by asking some key questions, forcing them to reflect on their work – however, for the benefit of the discussion, let participants also make some mistakes
- give additional support to groups that are working more slowly than the others
- it is important to give a minimum of feedback so that presentations are not completely wrong – participants will also feel better if they change their presentations to something more appropriate.

Facilitate the presentations and discussions

- › All members of a group must have a chance to present.
- › Ensure that the environment is always positive and that participants feel confident, especially during the feedback sessions. It is important that the feedback is constructive. Everybody is there to learn and there are various ways of achieving the same thing.
- › It is advisable for participants to give their comments first and the trainer to comment at the end. You may use the **SOCRATIC APPROACH**:¹
 - Know the answer you want
 - Open questioning
 - Paraphrase participants' answers
 - Summarize contributions
 - Add your own points.
- › As questions are raised, you may **reflect** on them and **deflect** them to the group, to a specific person or to the interlocutor.

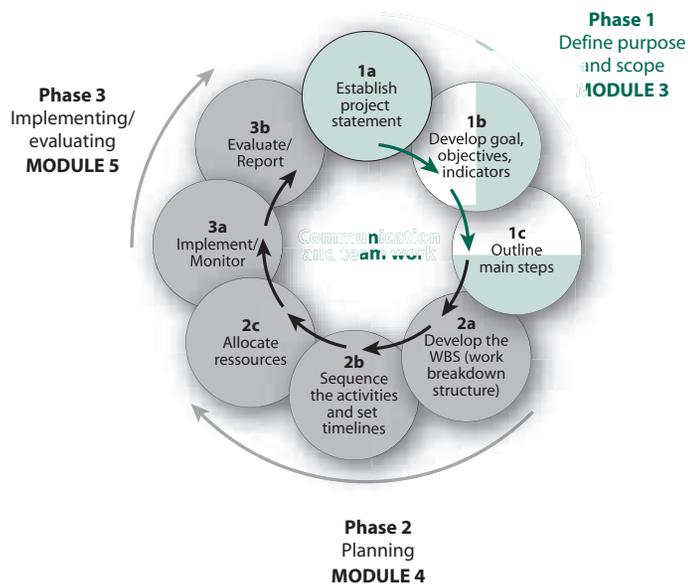
Manage the time carefully (see box "Time management" above)

- › When there is a need to make up time (when activities are delayed), it is advisable to (1) help the slowest groups during the working group sessions and (2) assign one participant to make comments or answer questions during the discussions, and follow on from there.

¹ Townsend J. *The trainer's pocketbook*, 8th ed. Alresford (UK): Management Pocketbooks; 1996.

PHASE 1

Defining the purpose and scope of the project (Module 3)



PHASE 1 A : ESTABLISH THE PROJECT STATEMENT

? Ask yourself:

- What needs to be done?
- Why does this need to be done?
- By what date must the work be finished?

- › Write a short paragraph of two to three sentences answering these questions and thereby giving boundaries to the project.

TRAINER'S NOTES



PHASE 1 A – Establish the project statement

Working group session: 30-45 min

Presentations and discussions in plenary session: 40-60 min (10-15 min for each group)

- › Participants break up into groups to work on their specific project.
- › Remind the groups to follow carefully the various steps described in their *Step-by-step guide*.
- › Allow 30-45 min for them to come up with a project statement.
- › Remember to circulate among groups, challenge them, solve their issues and give appropriate guidance to groups which are working slowly.
- › After the allotted time, each group must present its work to the rest of the participants using the data projector.
- › Encourage participants to give comments and suggestions and ask questions (see Socratic approach in “General tips” box above). You may ask questions such as:
 - are you happy with this statement?
 - does it answer the questions “what”, “why”, “by when”?
 - could we write it differently?
- › Make participants feel confident:
 - emphasize that there are several ways to write a statement
 - you may directly ask a specific participant to comment
 - reassure them that establishing a project statement is a **very** difficult task – they need to concentrate the whole project in 2-3 sentences – however, this is the whole basis for the project.
- › At the end, give your feedback.

PHASE 1 B : DEFINE THE PROJECT'S GOAL, OBJECTIVES AND INDICATORS

- **Define the goal**

- ? Ask yourself:

- Why is the project carried out?

- What will be the project's contribution, in a wider context?

- > Write a short and general sentence answering these questions and thereby describing the purpose of the project.

- **Define the objectives**

- ? Ask yourself:

- What will have been achieved by the end of the project?

- What requirements must be met?

- > Write a list of **objectives**, making sure that they are SMART:

- Specific

- Measurable

- Achievable

- Resourceable/ Realistic

- Time-specific

- **Define the indicators**

- ? Ask yourself:

- How will we know when we satisfy each objective?

- What can be measured to show that the objectives have been met?

- > For each objective, define one to three indicators that will be measured to indicate the achievement of the related objective. Make sure that the indicators are SMART.

PHASE 1 B – Define the goal of the project, its objectives and indicators

Working group session: 50-60 min

Presentations and discussions in plenary session: 80 min-2 hours
(20-30 min for each group)

- › Participants break up into groups once more to work on their specific project and come up with the goal, objectives and indicators for their project.
- › Indicators should be placed and presented together with the related objective.
- › Allow 50 to 60 min for them to come up with their goal, objectives and indicators.
- › Remind the groups to follow carefully the various steps described in their *Step-by-step guide*.
- › Remember to circulate among groups, challenge them, solve their issues and give appropriate guidance to groups which are working slowly.
- › After the allotted time, each group must present its work to the rest of the participants using the data projector.
- › Encourage participants to give comments and suggestions and ask questions (see Socratic approach).
- › Make participants feel confident.
- › At the end, give your feedback.
- › Remember:
 - a **goal** is broad, general and represents the big picture to which the project contributes – alone, the project is not sufficient to reach the goal
 - the **objective** should be SMART (Specific, Measurable, Achievable, Resourceable/ Realistic, Timely) – it is good to include timelines in the objective – however, if not in the objective, timelines should be defined in the indicator(s) corresponding to that objective
 - **indicators** will be measured at the end of the project to show whether or not the objectives were met – there may be several indicators for one objective – indicators should also be SMART – use specific, measurable terms.

Example

Objective: to isolate and elucidate one compound by Nov 2005.

Indicator 1: one compound isolated by Nov 2005.

Indicator 2: one compound structure elucidated by Nov 2005.

- Avoid general terms such as: “network established”, “functional system developed”. Instead, focus on how you can measure that:
 - the network has been established – X samples received by the reference centre, X number of teleconferences among the collaborative centre per semester, etc.
 - a functional system has been developed – standard operating procedures developed and used, culture maintained continuously, etc.

PHASE 1 C : OUTLINE THE MAIN STEPS REQUIRED TO ACHIEVE THE OBJECTIVES

? Ask yourself:

What are the main steps (blocks of activities) required in the project in order to reach the objectives?

- List the main steps that allow you to reach the objectives (about three to six main steps).

TRAINER'S NOTES

PHASE 1 C – Outline the main steps required to achieve the objectives

Working group session: 15-30 min

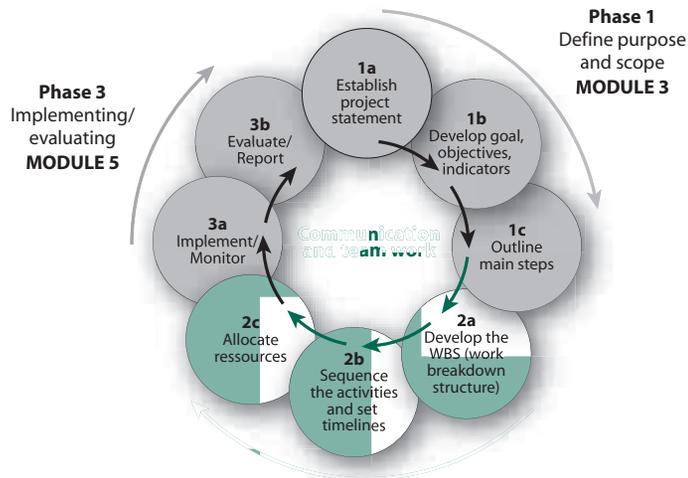
Presentations and discussions in plenary session: around 40-45 min (10 min for each group)

- Participants break up into groups to work on their specific project and come up with the main steps to allow them to reach the objectives.
- Allow 15-30 min for them to come up with the main steps of their project.
- Remind the groups to follow carefully the various steps described in their *Step-by-step guide*.
- Remember to circulate among groups, challenge them, solve their issues and give appropriate guidance to groups which are working slowly.
- After the allotted time, each group must present its work to the rest of the participants using the data projector.
- Encourage participants to give comments and suggestions and ask questions (see Socratic approach).

- › Make participants feel confident.
- › At the end, give your feedback.
- › Remember:
 - make clear that main steps are not a direct breakdown of objectives – they are the key blocks of activities identified in order to reach all objectives and a main step could contribute to reaching several objectives (e.g. “conduct a clinical trial” can contribute to reaching the following objectives: (1) assessment of drug X’s safety, (2) capacity-building, (3) good clinical practice implementation)
 - main steps should be seen as a single block of activities
 - 4-6 main steps can usually be identified per project
 - main steps are project-specific – groups should come up with their own main steps, which are specific to their project – the main steps presented in the KEP example should not be used as a template, they are just examples.

PHASE 2

Establishing the project development plan (Module 4)



You may choose to go through the various steps of phase 2 using *Microsoft Project* straightaway. Alternatively, you can first use simple tables and enter the data at the end in *Microsoft Project*.

Phase 2
Planning
MODULE 4



The sequence of this session depends on the group's pace of work.

- › First the trainer gives the *Microsoft Project* software demonstration.
- › Then groups are expected, during this case study session, to go through steps 2 a, 2 b and 2 c and develop a draft Gantt chart.
- › After the draft Gantt chart development, the trainer gives the *Microsoft PowerPoint* demonstration.
- › The groups are then expected to develop a draft PERT, following the instructions in the *Step-by-step guide*.
- › At the end, each group must present its Gantt and PERT charts to the rest of the participants.

Depending on the speed and pace of work of each group, the trainer may decide on the best time to give the *Microsoft PowerPoint* demonstration.

- › If all groups have their project Gantt chart ready at the same time (within the 7 hr allotted time), the trainer does the *Microsoft PowerPoint* demonstration, and groups start working together on the development of PERT charts.
- › However, if some groups are working faster than others and have their project Gantt chart ready earlier (before the 7 hours are up), the trainer may decide to interrupt the group work and give the *Microsoft PowerPoint* demonstration to all participants, allowing each group to continue working at its own speed afterwards – in this case some groups will continue working on their Gantt chart, while other groups may start working on their PERT chart – the trainer must monitor the groups and ensure that all have developed a draft Gantt chart after approximately 7 working hours, to allow enough time to work on the PERT chart – emphasize that, at this stage, they do not need to have a “perfect” Gantt chart – it is a draft that will be revised after the course.
- › Both Gantt and PERT charts should be presented and discussed, in plenary session, at the end of the module 4 case study.

PHASE 2 A : DEVELOP THE WORK BREAKDOWN STRUCTURE

Developing the work breakdown structure (WBS) involves “breaking down” each main step into more specific and detailed elements (activities) to be completed. Each of these activities is, in turn, further broken down into the various required tasks. Each of the tasks is then broken down into various sub-tasks, and so on. The level of breakdown depends on the required level of planning and monitoring. The last elements of the work breakdown structure are called “**terminal elements**”. The sum of all the terminal elements is equal to the whole project work.

- List the main steps of the project.
- For each main step, list the various activities required in order to complete it.
- For each activity, list the various tasks required in order to complete it.
- Break down the work until you reach the level of detail appropriate to (1) reach the level of monitoring required and (2) assign resources in a realistic way.
- Test the work breakdown structure: go through it and make sure it will accomplish the project objectives.

PHASE 2 B : SEQUENCE THE ACTIVITIES AND SET TIMELINES

- **Define the order of the various elements (main steps, activities, tasks) and their dependencies and links**
- ? Ask yourself:
 - Which elements start first?
 - Which elements need to be completed before moving to the next one?
 - Which elements can overlap?

- Develop a table and list how each terminal element depends on others, describing logically how those links work, for example, “activity X starts at the same time as activity Y with an overlap of X days”, “activity X finishes at the same time as activity Y”.
- **Set estimated duration and timelines**
 - Set the start date of the project.
 - Estimate the duration of each terminal element. This will determine the duration of the other elements.
 - Estimate the start date and finish date of all elements: most of these will be directed by the elements’ dependencies and their duration time.
 - Include these estimations in the table.
- **Define the milestones**

A **milestone** is a key event/achievement/decision, chosen strategically, to provide a measure of the project’s progress.

- List the key events, achievements and decision points which reflect the various steps of the project.
- Include the milestones and their estimated timelines in the WBS at the appropriate place.
- Make sure you have identified enough (but not too many) milestones in order to map the whole development of the project and so facilitate the monitoring of the progress. You may want to have from one to three milestones for each main step (this is a guideline only; you should apply common sense to your choice).

PHASE 2 C : ALLOCATE RESOURCES

- **Assign responsibility**
 - ? Ask yourself:
 - Who is responsible for each activity?
 - Enter responsibilities in a table.
- **Estimate costs**
 - Estimate the cost of activities.
 - Enter costs in your table.
- **Define who pays for what and include it in the table/plan**
 - In order to keep the plan as clear as possible, it might be most convenient to establish, in addition to the Gantt chart and to the PERT chart (see below), a table summarizing the budget, including financial contributors and responsibilities.

PRESENT THE PLAN AS A GANTT CHART (USING *MICROSOFT PROJECT*)

A **Gantt chart** is a graphic image of the project in which activities are represented by bars on a calendar.

It shows the duration and sequence of activities and the related milestones (in a diamond shape). A Gantt chart can also include resources.

Various planning software are available. *Microsoft Project* is a sophisticated software program providing an extensive tool for project management. This guide does not describe all the features provided by the software. It goes through how to use the basic features of *Microsoft Project* so that you can establish and design a Gantt chart representing the project development plan.



Software demonstration – general tips

- › Throughout the demonstrations, show the participants the steps described in the relevant sections of the *Step-by-step guide*: “Present the plan as a Gantt chart” and “Present the plan as a PERT chart”.
- › Ask participants to **watch and listen** without touching their computers – it is very difficult to listen while completing the steps at the same time – it will also be a good exercise for participants to go through the steps outlined in the *Step-by-step guide* on their own after the demonstration.
- › Make sure you go **slowly** and that all participants follow you.



Software demonstration – Microsoft Project – 20 min

- › Use a short (max. 15 tasks) and simple (max. three levels of indentation) example (as shown below) and go, very slowly through the 18 steps described in this section to develop a Gantt chart.



- › When making the *Microsoft Project* software demonstration, remember to add the **milestones** (item 7 in the example Gantt chart above) and the summary task (item 0 in the example Gantt chart above) only **after** all tasks are listed and linked, as presented in section “Present the plan as a Gantt chart”. **Once you have inserted the milestone, be aware that it will have an impact on the task numbers.**
- › Slowly go through the steps described in the *Step-by-step guide* until you reach: “Insert the ‘project summary task” (step 15). This and the following steps will be

shown after all participants have developed a first draft. They should first focus on the basic steps and feel confident with them before learning additional features.

- › Emphasize that performing the steps in **this order** is essential for “friendly use” of the *Microsoft Project* application.

To enter the plan in *Microsoft Project*, carefully follow the steps described below:

- 1) **Open a *Microsoft Project* file.**
- 2) **Close** the “getting started” window on the left of the screen and then the “tasks” window on the left of the screen.
- 3) **Format the calendar:** double click on the timescale and choose the appropriate unit for the “middle tier” timescale and for the “bottom tier” timescale (year, quarter of a year, month, week). Use the middle tier as the major scale of the calendar and the bottom tier as the most detailed scale of the calendar.
- 4) **Save** the file.
- 5) **Enter the project starting date:** go to “project”/“project information”.
- 6) **Enter the elements of the WBS** in the “task name” column (one element per row): follow the steps described in the “Phase 2 a” section.

 The main steps, activities, tasks and subtasks must be written in a comprehensive way, i.e. they need to reflect an **action**. For example, “Study protocol” would not be appropriate and would need to be replaced by “Study protocol development”, “Study protocol approval”, etc.

- 7) **Indent the elements** according to your WBS by using the “indent” icons in the tool bar (arrows).
- 8) **Enter the estimated duration time** in the “duration” column: use “ed” for days use “ew” for weeks.

 Make sure that participants understand the difference between “*elapsed days*” and “*days*”. Remember that in *Microsoft Project* “*elapsed days*” counts all days in a week (includes weekends), while “*days*” counts only Monday to Friday. Therefore 7 “*elapsed days*” correspond to a normal week and 7 “*days*” correspond to 7 working days i.e. more than a week. Ask participants to use elapsed days (ed) in their Gantt chart.

- 9) **Enter the links** in the “predecessors” column for each terminal element: see section “phase 2 b”.
- Enter the number of the task to which the selected element is linked.
 - Then next to it, without inserting a space, enter the dependencies (see examples in the box below):
 - “SS” (a task Starts when another one Starts)
 - “FF” (a task Finishes when another Finishes)
 - “FS” (a task Finishes when another Starts)
 - “SF” (a task Starts when another Finishes).
 - If needed, next to the dependence enter delay or overlap (add or subtract an amount of time (“ed” for day and “ew” for weeks) to the date e.g. “+6ew” for “6 weeks later”, “-30ed” for 30 days earlier).
 - It is possible to enter several links for one element (separate the various links with comas).



Remind participants that **terminal elements** are the last and most detailed elements of the work breakdown structure of a project. Terminal elements depend on the level of detail of the plan.

Some examples of links and dependencies

Taking task 5 as an example, here are some options for how links can be entered:

“4FS” means that when task 4 finishes task 5 starts

“3SS” means that when task 3 starts task 5 starts

“1SS+3ew” means that task 5 starts when task 1 starts but with a delay of three weeks

“1SS-3ew” means that task 5 starts three weeks before task 1 starts

- 10) **Enter the “start date” or “finish date”** of tasks in the relevant columns **only when absolutely required** i.e. certain activities must be accomplished by or on a defined date. These are constraint dates.

Many of the “start” and “finish” dates will be set automatically according to the links, the project start date and the task duration previously entered. These links allow you, as you revise the plan and want to enter a delay for a task, to simply enter the delay in the “duration” column and to have the impact of the delay on the whole project schedule shown automatically.

- 11) **Adapt the time schedule scale:** look at the whole Gantt chart and adapt the format of the time schedule to the timelines of your project.
- 12) **Insert the milestones** defined in the “phase 2 b” section: select the task which will follow a milestone, go to “insert/new task”, enter the milestone name in the task column and enter “0” in the “duration” column. Ensure that milestones reflect the various steps of the project development and in this way provide a tool for the project monitoring.

TRAINER'S NOTES



Remind participants:

- Milestones are key events, achievements, decisions in the project development.
- The purpose of milestones is to map the progress of the study.
- Milestones have 0 day duration and they must be linked to the corresponding tasks.
- There is a difference in wording between an activity and a milestone. Activities are usually written as actions, while milestones are written as “something accomplished/done”, start/end of an activity or an event at a point in time. For example:
 - activity: identification of X compounds
 - milestone: X compounds identified.
- Other examples of milestones:
 - ethical clearance obtained
 - collection of samples started.

- “Progress report submission” is not a good milestone. Although it can be seen as an event in time, it does not give any idea of the progress of the project, since the progress report will have to be submitted whether or not the project development has progressed or not.
- It is advisable to have at least two milestones per year in a project plan.

- 13) Insert the name of the responsible person (optional)** in the “resource names” column.
- 14) Insert activity costs (optional)** in a “cost” column that you can insert by first selecting the whole “resource names” column and then going to the “insert” / column; in “field name”, choose “cost”.
- 15) Insert the “project summary task”**: go to “tool/options” and click the “show summary tasks” option (at the bottom of the window). By default the summary task shows the file name. Choose the appropriate wording and add the **version date** next to it.



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Break at this point and ask participants to prepare a draft Gantt Chart for their project following steps 1 to 15 described above. Steps 16 to 18 can be demonstrated later on when participants have become familiar with the basic features of *Microsoft Project*.

- 16) Format the Gantt chart** using the Wizard: go to “format” / Gantt chart wizard and follow the directions (you may not want to choose to see the link lines between dependent tasks as this may look confusing).



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You may suggest the format “standard style 2” because it makes the reading of the graphic easier.

- 17) Review the plan and ensure that it is coherent** and allows the team to meet the project objectives.
- 18) Save the plan as a picture in a Microsoft Word or PowerPoint document** in order to be able to circulate it to all relevant parties who might not have access to *Microsoft Project*.

- a) Open a *Microsoft Word* (or *PowerPoint*) document, set the paper size as “landscape” and open several blank pages in the document (one page will usually be sufficient for 30 to 45 tasks in *Microsoft Project*).
- b) In your *Microsoft Project* file, select the 30 to 45 first tasks starting from the top, including the task number column.
- c) Go to “edit” and select “copy picture”.
- d) In the “copy picture” window select the “for printer” and “selected rows” options and select the timescale inserting a date one or two months earlier than the “start date” of your project and a second date corresponding to one or two months after the “finish date” of your project (this give the complete picture of the project).
- e) Go back to the *Microsoft Word* (or *PowerPoint*) document and paste what you just copied by right clicking and choosing the “paste” option.
- f) Adjust the position of the inserted picture by first selecting it (clicking on it), right clicking, (at this stage in *Microsoft Word* choose “format picture/layout/in front of text/ok”) and then selecting it and dragging it.
- g) Adjust the size of the inserted picture by first selecting it, then position the cursor on the small square at the top left of the picture until it becomes a double arrow shape cursor and finally drag the picture diagonally in the opposite corner direction until the required size is reached.
- h) Repeat the above steps, but copying the next 30 to 45 tasks of the project, and paste the picture in the following page of the *Microsoft Word* (or *PowerPoint*) document.
- i) Continue until the whole project is copied, format the document (title, date, pages, etc.) and save it.



PHASE 2 A, 2 B, 2 C – Develop the work breakdown structure, sequence the activities, set the timelines and allocate resources – develop a Gantt chart

Working group session: 7 hours

- Participants break up into groups to work on their specific project.
- Allow 7 hours (two periods) for them to develop a draft Gantt chart going through the three steps of phase 2.

- › Remind the groups to follow carefully the various steps described in their *Step-by-step guide*.
- › If participants feel confident, they may develop their work breakdown structure directly in *Microsoft Project*. Indeed, this can be more practical and will save time.
- › Participants should develop a draft Gantt chart **following carefully the various steps** described in the *Step-by-step guide*, pages 13-16.
- › Mention that you will be circulating from group to group and that participants may ask you for advice and assistance.
- › As you circulate among groups, challenge them, solve their issues and give appropriate guidance to groups which are working slowly.
- › Once early drafts are available, print copies for each group so they can analyse their work and revise their drafts.
- › Then print all revised drafts for all participants.

If groups are working at the same pace, when they have all developed a draft Gantt chart, the trainer moves to the next step, the *Microsoft PowerPoint* demonstration (see next section). This must be within the allotted time.

If groups are not working at the same pace, and 1-2 groups are ready with their Gantt chart before the allotted time is up, you may interrupt the case study and give the *Microsoft PowerPoint* demonstration, to allow these groups to start drafting a PERT chart for their project.

The other groups continue to work on their Gantt chart before starting the PERT.

In this case, the trainer must make sure that after the allotted time, all groups have their draft Gantt chart developed and start working on the PERT chart.

PRESENT THE PLAN AS A PERT CHART (USING *MICROSOFT POWERPOINT*)

A **PERT chart** is a graphic image of the project in which activities are represented by boxes linked to each other by lines or arrows. Decision points are represented by diamond shapes. A PERT chart describes the various activities to be completed, their relationships and the logical links between them. It shows the flow of the various activities, starting from the left side and finishing at the right side. It also reflects the plan's timelines and possibly also its resources.



Software demonstration – *Microsoft PowerPoint* – 15 min

Go, **very slowly**, through the steps described in the *Step-by-step guide*. You may use the same example as for the Gantt chart. However, you do not need to draw the whole PERT chart. Your objective is to ensure that participants know the basic drawing features of *Microsoft PowerPoint* and how to draw their chart.

- 1) You may first make a draft diagram on paper.
- 2) **Open a *Microsoft PowerPoint* file** (blank presentation).
- 3) **Make the drawing toolbar available** on the screen: go to “view / toolbars / drawing toolbar”.
- 4) **Adjust the font size to 10 or 12** (formatting toolbar).
- 5) **Represent the main steps, activities and tasks** by boxes:
 - a) Insert a box on the sheet: click on the rectangle icon (drawing toolbar) once, then click on the sheet.
 - b) Change the size and shape of the box by first selecting it (clicking on it) and then clicking on the small square at the low right end of the box and dragging it.
 - c) Format the box by first selecting it (click on it) and then using the different icons on the drawing tool bar (to know what each icon is, place the cursor on it, to select it, click on it, to have access to various choices, click on the little arrow next to it).
 - d) Insert text in the box by selecting the box and typing in the text.



Remind participants to provide the exact meaning of the activity when entering it in a box. Example: use “Purchase of equipment” instead of “Equipment”.

- e) Format the text by first selecting the box and then using the formatting tool bar and the drawing tool bar for the colour.
- f) To copy the box, press “Ctrl” while clicking on the box and dragging it on the side (make sure you do not release “Ctrl” before releasing the mouse).

- 6) **Represent decision points** by a diamond shape. Remember, milestones do not need to appear in the chart. In the drawing tool bar go to “auto-shape” / “flow chart” / select the desired shape and click on the sheet. Format it as for the boxes.
- 7) **Organize** the position of the various boxes and the decision points so that the sequence of the elements is described.
 - a) The starting point is placed on the left of the diagram and the finishing point on the right.
 - b) To move a box, click on it and drag it to the selected place.
- 8) **Link the boxes** using lines or arrows thereby describing the sequence and interdependence of the elements.
 - a) Click on the “line” or “arrow” icon of the drawing tool bar.
 - b) Click on the place where the line or arrow should start and drag until the point where the line or arrow stops.
 - c) To format the line or arrow, do as described for the box formatting (size, style, colour).
- 9) When the network diagram is laid out, **insert under each box the start-finish dates using the “text box” icon** (click on it, click on the sheet and type the text then format).
- 10) You may also **insert information on responsible persons and costs (optional)** under each box.
- 11) **Insert the title, the version date and the legend of decision points.**



Remind participants to :

**T
N
Z**

- › make the chart as simple as possible – the project must be clear, straightforward and easy to understand
- › ensure that each colour, shape, line and arrow has a SPECIFIC meaning – the chart is a tool, not a piece of art and too many different colours and formatting styles can be confusing.

- 12) **Ensure the diagram is coherent and as simple as possible. Use colours and different shapes only when they have a specific meaning.**
- 13) **Ensure that the plan is feasible and allows the team to meet the project objectives.**



TN

Remind participants to include timelines: it is advisable to **write** months as text, not numbers (Jan 04, Apr 07, etc.), **since this** is easier to understand and read.



TN

Explain at the end how to present a PERT chart (step by step in chronological order).

1. Point out where we want to go: the goal.
2. Present the title and the version date.
3. Point out where we start: starting point.
4. Go through all main steps to be completed.
5. Show all activities needed in order to complete each main step.



TN

Development of a PERT chart using Microsoft PowerPoint

Working group session: 3 hours 30 min

- Participants break up into groups to work on their specific project.
- Allow 3 hours 30 min for them to develop a draft PERT chart for their project.
- Remind the groups to follow carefully the various steps described in their *Step-by-step guide*.
- Remember to circulate among groups, challenge them, solve their issues and give appropriate guidance to groups which are working slowly.



TRAINER'S NOTES

Presentation and discussion of Gantt and PERT charts: 90 min (20-25 min per group)

- Allow some time for participants to read the draft plans before the presentations. If appropriate, you may wish to distribute the chart copies (early versions, final draft version) to participants at the end of the day for them to look at overnight.
- After the allotted time, each group must present its work to the rest of the participants using the data projector (**make sure version date is included**).
- Make sure they present their PERT chart in a clear and logical way:
 1. Point out where we want to go: the goal.
 2. Present the title and the version date.
 3. Point out where we start: starting point.

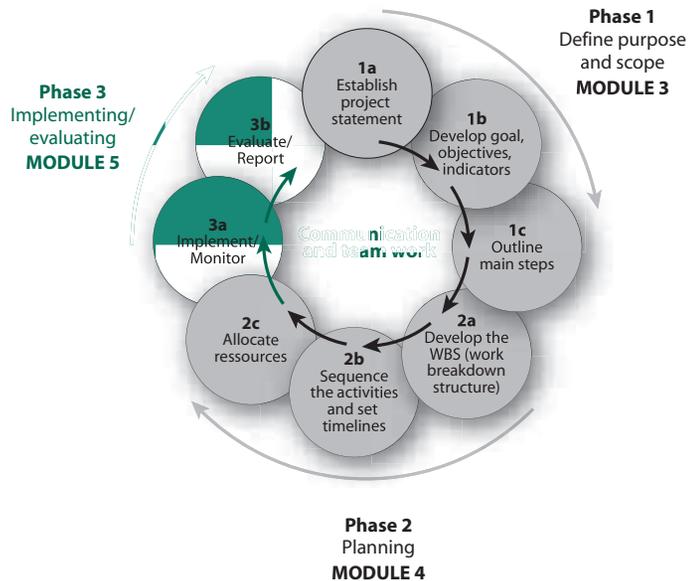
4. Go through all main steps to be completed.
5. Show all activities needed in order to complete each main step.

Encourage participants to give comments and suggestions and ask questions (see Socratic approach).

- › Make participants feel confident.
- › At the end, give your feedback. Summarize the main comments made in a constructive way and emphasize that this is a draft.
- › Emphasize that the Gantt chart and PERT chart provide complementary information and facilitate discussion within the team.

PHASE 3

Implementing, monitoring, evaluating and reporting (Module 5)



-  During this case study session, participants cannot go through Phase 3 a and
-  Phase 3 b, since these steps are related to project implementation and monitoring.
-  However, in order to prepare for these steps properly, participants are expected to (1) define their team and draft the modus operandi for efficient teamwork within the project development team and (2) draft the project reporting process. They will present their drafts (followed by discussion) once they have accomplished both assignments.

PHASE 3 A : IMPLEMENT AND MONITOR THE PROJECT

- Once the development plan is completed, agreed and approved by the project team and all relevant parties, the project's implementation can start.
- The start of the implementation might be **officially** given after the project team has met to review the complete plan and to discuss potential issues.
- The project manager should carefully and regularly monitor the project, reviewing the achievement of the milestones and checking if all activities are completed on time, and are within the agreed quality standards and budget.
- The project team should meet and discuss the progress of the project and any potential issues on a regular basis.
- As deviations from the initial plan are identified, an analysis of the situation should be made and the decision on how to proceed should be taken by the project team. The project development plan should be updated accordingly and circulated to the implementing team and the relevant parties.

PHASE 3 B : REPORT AND EVALUATE THE PROJECT

- The project manager reports regularly on the progress of the project to all project team members and to relevant management groups.
- Progress reports describe the evolution of the project and its status at the time of the report. They also include a revised plan including any updates and changes. They report on the quality, timelines and finances aspects of the project activities and on the achievement of the milestones.

- Once the project is completed it is formally closed and evaluated.
- The evaluation focuses on the quality, timelines and finances aspects of the project and confirms whether the objectives were met by measuring the indicators. It is described in the final report.
- During the course, as part of the case study exercise, participants are asked to prepare the following draft documents which will be reviewed and endorsed by the project team after the course:
 - **Draft the modus operandi for an efficient team work within your project development team:**
 - Define the project development team members: names and expertise
 - List respective responsibilities of each member in this project
 - Define the means of communication to be used (type and frequency)
 - Define the main items to be included in the agenda of project development team meetings/ teleconferences for discussion.
 - **Draft the project reporting process:**
 - Types of reports
 - Frequency
 - Content.



PHASE 3 A – Implement and monitor the project

PHASE 3 B – Report and evaluate the project

Working group session: 60-90 min

Presentations and discussions in plenary session : around 60-90 min (15-25 min for each group)

- › Participants break up into groups to (1) define the project team and draft the modus operandi for efficient teamwork within the project development team and (2) draft the project reporting process.
- › It is important that participants define their team and draw up a table including:
 - the names of team members
 - their area(s) of expertise
 - their responsibilities in this project
 - the mode of team communication – meeting, telecommunication, email briefing, spontaneous emails – their frequency – who will initiate them – etc.
- › Allow 60-90 min for participants to establish this table and draft a project reporting process.
- › Remind the groups to follow carefully the various steps described in their *Step-by-step guide*.
- › Remember to circulate among groups, challenge them, solve their issues and give appropriate guidance to groups which are working slowly.
- › After the allotted time, each group must present its work to the rest of the participants.
- › Encourage participants to give comments, suggestions and ask questions (see Socratic approach).
- › Make participants feel confident.
- › Ultimately, give your feedback.

Integrated example used through the course

KEP example – KEP antibodies levels in humans naturally exposed to malaria (*Plasmodium falciparum*)

The 'Key Example Protein' (KEP) of *Plasmodium falciparum* is a prime candidate for inclusion in a vaccine against malaria. Presence of KEP antibodies is associated with naturally acquired protection against malaria attacks in humans. In animal models, vaccination with KEP induces the production of antibodies that provides protection against experimental *Plasmodium falciparum* infection.

In this project (2002-2005) the prevalence of KEP antibodies within populations in malaria-endemic areas will be determined through:

1. a study looking at the levels of KEP antibodies in subjects of different age (cross-sectional study)
2. a study looking at the levels of KEP antibodies in pregnant women and at the transfer of these antibodies to their infants and their dynamics during the first year of life (longitudinal study).

It is expected that the results of these studies will provide critical information for the development of an effective vaccine against malaria.

This project is based on the collaboration of several partners:

- Department of Molecular Immunology in Gabon (home institution/project management)
- Institute of Child Health in Gabon (management of child health care/field work)
- Department of Community Medicine and Primary Care in Gabon (field study site)
- Medical Research Institution in Europe (training in KEP, immunity in malaria vaccine development, research material).

The project also aims at enhancing malaria research capacity in the involved African institutions: PhD and MSc students, and achieve technology transfer from European partner to Gabon etc.

KEP example – Project statement

In order to provide critical information for the development of an effective vaccine against malaria, the project aims to determine, by the year 2005, the levels of KEP antibodies in humans naturally exposed to malaria (in relation to age, pregnancy, transfer to newborn infants).

KEP example – Project goal

To provide critical information on KEP antibodies levels for the development of a vaccine against malaria for children in Africa.

KEP example – Objectives

By June 2005:

1. to assess the correlation of the levels of KEP antibodies with age and parasitemia
2. to determine if KEP antibodies are transferred from pregnant mothers to their infants, and to evaluate KEP antibody production from birth through the first year of life
3. to develop human resources and infrastructure to enhance malaria research in Gabon.

KEP example – Indicators for each objective

By June 2005:

Objective 1

To assess the correlation of the levels of KEP antibodies with age and parasitemia

Indicator:

Distribution of KEP antibodies according to age and parasitemia described

Objective 2

To determine if KEP antibodies are transferred from pregnant mothers to their infants, and to evaluate KEP antibody production from birth through the first year of life

Indicators:

- A. Frequency of KEP antibody transferred to the infants identified at birth*
- B. Levels of KEP antibodies produced in the first year of life described*

Objective 3

To develop human resources and infrastructure to enhance malaria research in Gabon

Indicators:

- A. 2 PhD students trained*
- B. 6 MSc students trained*
- C. 1 post doctoral scientist trained in special skills/techniques*
- D. transfer of technology to Gabon laboratory by European partner (malaria vaccine development)*

KEP example – Main steps

- | | |
|---------------------------|----------------------|
| 1. Seeking approval | 5. Data management |
| 2. Study site preparation | 6. Reporting |
| 3. Field studies | 7. Capacity-building |
| 4. Laboratory analysis | |

KEP example – Work breakdown structure outline

Each main step (approval, study site preparation, field studies etc.) has been further broken down into various activities and tasks.

1. SEEKING APPROVAL

1.1. Protocol, case report form, informed consent development

1.2. Protocol, case report form, informed consent finalization

1.3. Ethical approval

1.3.1. Local

1.3.2. WHO

1.4. Transfer of funds

2. STUDY SITE PREPARATION

2.1. Arrangement of transport

2.2. Recruitment and training of field staff

2.3. Provision of required equipment / material

3. FIELD STUDIES

3.1. Cross-sectional study

3.1.1. Recruitment of volunteers

3.1.2. Blood collection

3.1.3. Axillary temperature measurement

3.2. Longitudinal study

3.2.1. Recruitment of pregnant women

3.2.2. Etc...

KEP example – The sequence and dependencies of each terminal element of the work breakdown structure

1. SEEKING APPROVAL

- 1.1. Protocol, case report form, informed consent development start as soon as possible
- 1.2. Protocol, case report form, informed consent finalization starts after 1.1 is finished
- 1.3. Ethical approval
 - 1.3.1. Local starts after 1.2 is finished
 - 1.3.2. WHO starts after 1.3.1 is finished
- 1.4. Transfer of funds starts after 1.3.2 is finished with 3 weeks of delay

2. STUDY SITE PREPARATION

- 2.1. Arrangement of transport starts after 1.2 is finished
- 2.2. Recruitment and training of field staff starts after 2.1 is finished
- 2.3. Provision of required equipment / material starts after 1.4 is finished

3. FIELD STUDIES

3.1. Cross-sectional study

- 3.1.1. Recruitment of volunteers starts after 2 is finished
- 3.1.2. Blood collection starts at the same time as 3.1.1
- 3.1.3. Axillary temperature measurement starts at the same time as 3.1.1

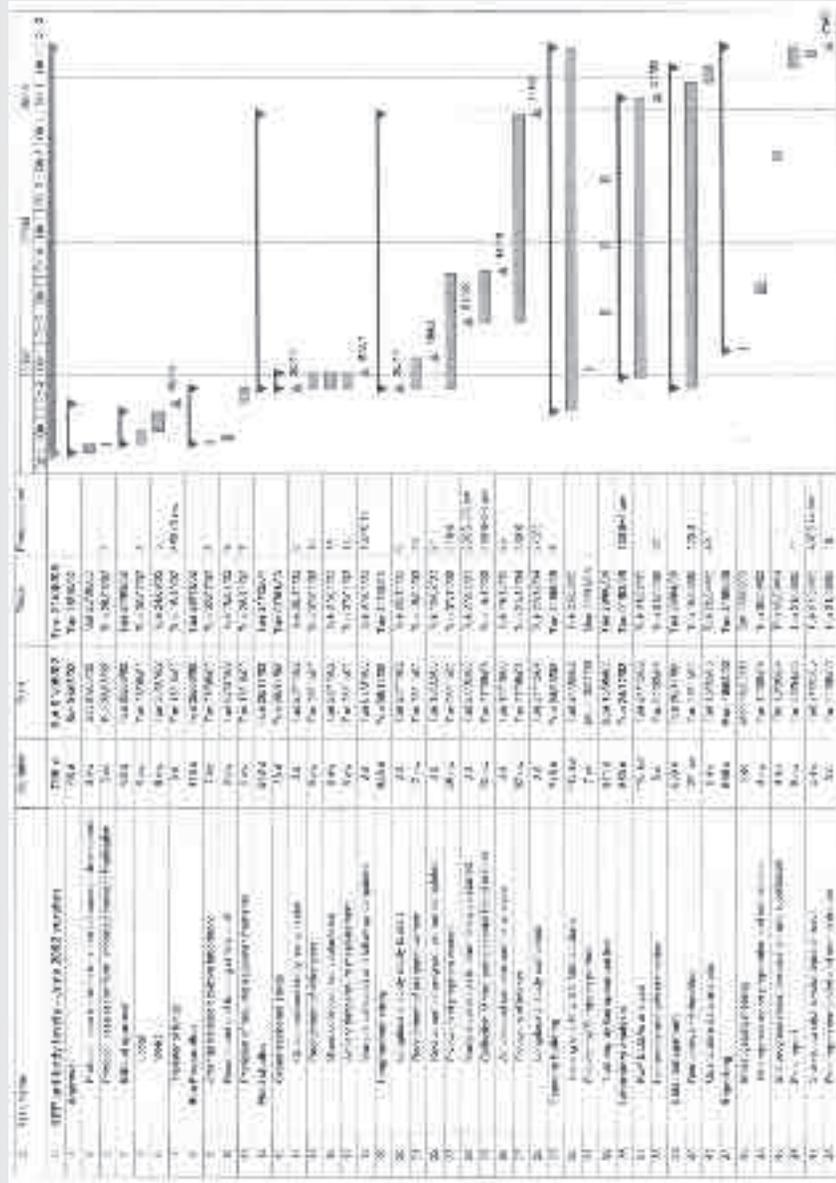
3.2. Longitudinal study

- 3.2.1. Recruitment of pregnant women starts after 2 is finished
- 3.2.2. Etc...

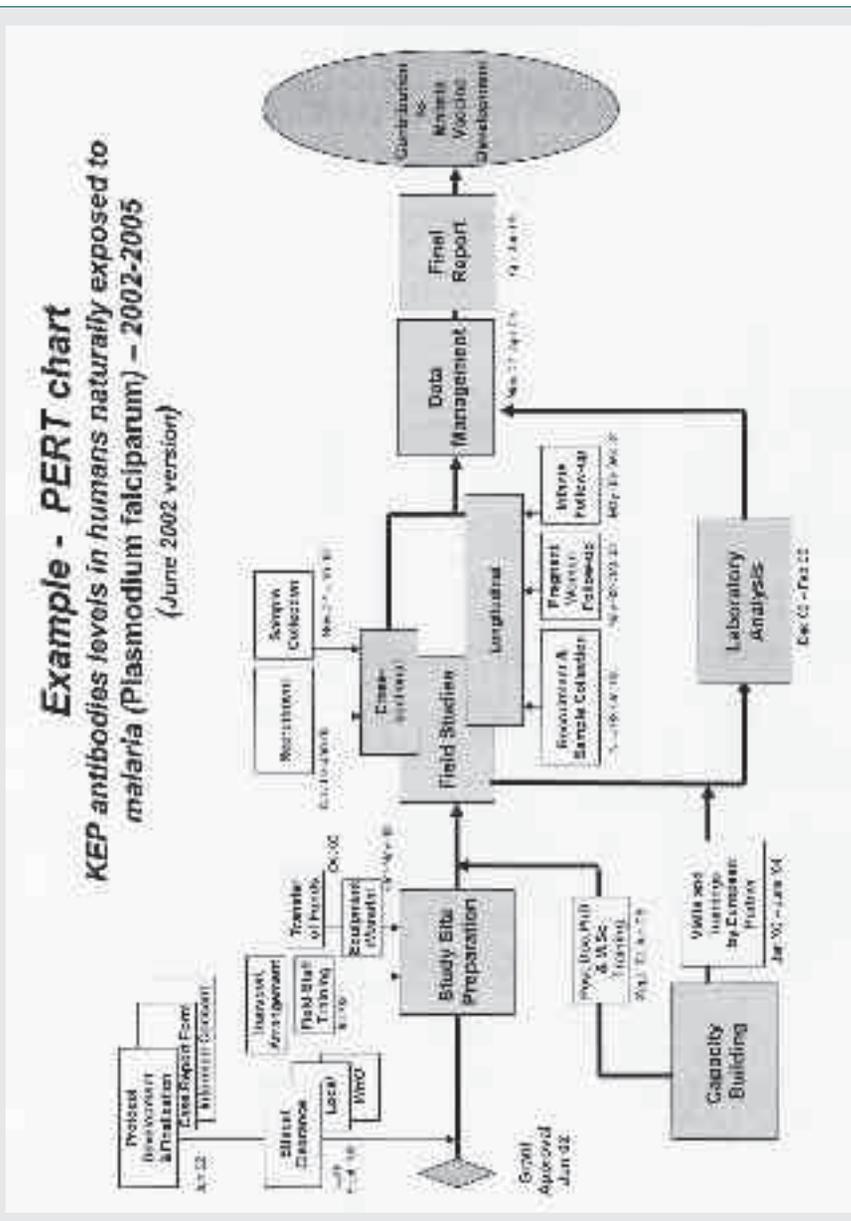
KEP example – Milestones

1. Ethical approval obtained and transfer of funds made by October '02
2. Cross-sectional study ready to start by November '02
3. Sample collection and follow-up of cross-sectional study completed by January '03
4. Longitudinal study ready to start by November '02
5. Recruitment of pregnant women completed by February '03
6. Sample collection and infant follow-up in longitudinal study started by May '03
7. All collected samples sent for analysis by October '03
8. Longitudinal study completed by December '04
9. Laboratory analysis completed by February '05
10. Final report sent to donors by June '05

KEP Example – Gantt Chart – KEP antibodies levels in humans naturally exposed to malaria (*Plasmodium falciparum*)



KEP Example – PERT chart



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Skill building

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