

Participatory Epidemiology: A Guide for Trainers

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African Union/Interafrican Bureau for Animal Resources

PO Box 30786

00100 Nairobi

Kenya

Participatory Epidemiology: A Guide for Trainers

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Chapter 1

Introduction

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Chapter 1 Introduction

What is Participatory Epidemiology?

Participatory epidemiology (PE) is an emerging branch of veterinary epidemiology which is based on the principles and methods of Participatory Rural Appraisal (PRA). In some contexts, PE is used in a very similar way to PRA but focuses on animal health issues rather than taking a broad view of problems in a given community (as is the case with PRA). At other times, PE is used to work with communities to study specific disease problems and identify best-bet solutions. In these cases, PE methods can be standardized and repeated to improve the reliability of information. Ideally, standardized methods still leave scope for the open-ended and flexible inquiry typical of PRA, while also allowing direct comparison of views obtained from different community members.

As a relatively new field in epidemiology, many issues concerning the use and development of PE methods have yet to be explored. Despite this, the use of PE in Africa and Asia has highlighted how it can assist veterinary workers at both field and central levels. Consequently, PE is attracting increasing interest from veterinary epidemiologists, veterinary investigation officers and researchers.

Approaches and Methods for Participatory Epidemiology

The successful use of PE requires attention to the attitude and communications skills of practitioners, plus the correct application of specific PE methods. Increasingly it is being recognised that when using PE, the way we interact with livestock-rearing communities is more important than our knowledge of methods. From an epidemiological perspective, the type and value of information contributed by informants is highly dependent on the relationship between them and the practitioner. Also, any action that arises from PE such as a community-based project, vaccination or further research, requires good understanding between veterinary workers and local people. For these reasons, a key aspect of PE training focuses on attitudes and communication.

A wide range of PE methods are available and these methods can be categorised into three main groups: informal interviews; visualisation methods; and ranking and scoring methods. Information derived from different methods is cross-checked or 'triangulated' in a similar way that a clinician combines information from different sources to reach a diagnosis. Indeed, the use of conventional veterinary diagnostic

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tools is an integral part of, and in some cases overlap with PE methods. These tools include direct observation, livestock carer interviews, and clinical and pathological examination.

Table 1.1 Some methods for participatory epidemiology

Information required	PE methods
Any information	Informal interviews
System boundary	Natural resource maps, social maps.
Social organisation	Social mapping, Venn diagram
Wealth groups	Wealth ranking
Relative livestock ownership	Proportional piling
Role of livestock in household economy	Livelihood analysis
Preferred types of livestock reared	Livestock species scoring
Income from livestock	Proportional piling
Marketing structure	Flow diagrams, service maps
Veterinary services	Service map, Venn diagrams, ranking and scoring
Animal husbandry	Seasonal calendars, mobility maps, transects
Resources available to rear livestock	Natural resource maps, transects.
History of livestock diseases	Timelines
Priority livestock diseases	Livestock disease scoring
Seasonal variations in livestock disease	Seasonal calendars
Relative mortality rates	Proportional piling
Livestock productivity	Progeny history

Uses of Participatory Epidemiology

Community-based animal health systems

Probably the most common use of PE has been during animal health surveys and problem analysis conducted during the early stage of community-based animal health worker (CAHW) projects. Typically, a rapid but appropriate approach has been

used with one-off use of methods and limited triangulation with other PE methods or conventional investigation. However, many programmes based on this use of PE have shown good success. Methods that are commonly used during the design of CAHW projects include disease ranking, mapping and seasonal calendars.



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Increasingly, PE methods are also being used in impact assessment of CAHW programmes. For example, before-and-after methods enable local perceptions of changing disease patterns to be understood and related to possible causes, such as the activities of CAHWs.

Participatory disease searching

A specific adaptation of PE for epizootic disease control is 'participatory disease searching'. This methodology evolved in the Pan African Rinderpest Campaign and used pastoralists' knowledge of rinderpest to locate disease outbreaks in remote areas. The approach was based on PE methods such as semi-structured interviews and in particular, the use of probing questions to delve deeply into local knowledge about rinderpest. Also, mapping and time-lines were used to build an historical picture of rinderpest outbreaks in a given area. These methods were used in combination with conventional veterinary investigation methods such as clinical and laboratory examination. When the searching team actually located a rinderpest outbreak, the involvement of livestock keepers during the disease search meant that discussion on the action required to control the outbreak was easily initiated. At the time of writing, PDS was becoming increasingly important within the Pan African Programme for the Control of Epizootics (PACE) as Horn of Africa countries tried to identify remaining foci of rinderpest in remote areas. FAO EMPRES was also supporting PDS activities for foot and mouth disease, peste des petits ruminants in Pakistan, and for classical swine fever in the Americas.



Research

Participatory epidemiology has been used in various ways in veterinary research. A few examples are provided below and more information can be found in the references in the Further Reading section.

Diagnostic studies and characterisation of diseases

Participatory epidemiology has been used to investigate disease syndromes of unknown or mixed aetiology. For example, in southern Sudan PE was used to study a chronic wasting syndrome in cattle and revealed mixed infections with liver fluke, trypanosomes, gastrointestinal helminths and schistosomes.



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Basic research on the epidemiology of endemic and epizootic diseases, and local preferences for control

Estimates of disease incidence and mortality can be derived from PE, leading to improved understanding of local disease priorities. The description and analysis of a number of diseases simultaneously helps to avoid exaggeration and can lead to comparison of different disease control options. This approach has been used with Orma communities in Tana River District, Kenya.



Exploring association

One of the most recent adaptations of PE has been the assessment of association between acute and chronic disease. In Tanzania, a chronic syndrome in cattle causing heat intolerance and overgrowth of hair was thought to be associated with previous, acute foot and mouth disease. Methods such as proportional piling can be used to test this hypothesis.



Disease modelling generates computer simulations of disease which can assist epidemiologists to develop or improve disease control strategies. By understanding the way a disease moves between animals in a population, appropriate methods to interrupt disease transmission can be identified. By using participatory approaches and methods in combination with disease models, researchers can avoid a common problem of disease models – the isolation of modellers from realities on the ground.

Links between PE, PDS and Community-based Animal Health Workers

A common point of misunderstanding is the definitions and links between PE, PDS and Community-based Animal Health Workers (CAHWs). Community-based animal health workers (CAHWs) are community members who are selected by the community for basic training in disease prevention and control. They can also contribute to disease reporting by providing regular activity reports to their supervisors (veterinarians or animal health assistants), plus reports of disease outbreaks to their supervisors. Therefore, CAHWs can complement conventional disease reporting systems and this activity is termed community-based disease reporting, not PE or PDS.

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Community-based animal health workers do not usually conduct PE – this is a role for veterinarians (see below), but can assist veterinarians who are using PE. A key feature of PE is triangulation or crosschecking information derived from different sources and methods. These different sources and methods include conventional veterinary investigation methods such as clinical and pathological examination, and laboratory diagnosis. Therefore PE should be conducted by veterinarians who have been trained in the approach and not CAHWs.

Participatory disease searching (PDS) is one branch of PE. In PDS the objective is often to find cases of suspected rinderpest and then use laboratory tests to confirm the diagnosis. As PDS requires interpretation of information provided by livestock keepers and other informants, it is an activity that is best conducted by veterinarians trained in the approach.

Community-based animal health workers can assist veterinarians who are using PE or PDS by:

- acting as a link between veterinarians and communities. CAHWs are trusted members of a community and can help to establish good rapport and understanding between the vets and community members;
- acting as key informants e.g. by advising vets about other key informants in the community and providing information on the local disease situation;
- helping to organize community meetings, visits to herds, sampling and so on;
- if trained and supervised, CAHWs can also be very useful for sample collection;
- assisting with feedback of results to the community.

Although CAHWs do not conduct PE or PDS, they can greatly assist veterinarians who are undertaking these activities in marginalized areas.

The Need for Training and Field Experience in Participatory Epidemiology

In November 2001, the African Union/Interafrican Bureau for Animal Resources (AU/IBAR) organised a regional workshop *Participatory Epidemiology: Lessons Learned and Future Directions* in Addis Ababa, Ethiopia. Participants included senior veterinary epidemiologists, and deans of veterinary schools and academics from seven countries. International epidemiologists from universities in Berlin, Edinburgh and Reading, and the International Livestock Research Institute also participated. A key recommendation of the workshop was for AU/IBAR to support training in PE for national epidemiology units, veterinary schools and research centres in the region. As a result of the Addis Ababa

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workshop, AU/IBAR organised a regional training course in PE for veterinarians and epidemiologists from the Horn of Africa region in Arusha, Tanzania in April 2002. Experiences from this course form the basis for the general PE training sections of this guide.



The Arusha PE Training course was followed up with a field studies programme, also supported by AU/IBAR. This programme was intended to give trainees experience of using PE in a real disease study in the field. Therefore, the Arusha trainees were given an opportunity to apply and adapt the skills and knowledge acquired during the training.

About the Guide

This guide aims to provide trainers with ideas and materials for PE training courses aimed primarily at veterinarians. Effective training in PE is best achieved through the use of participative training techniques (PTT). Therefore, this guide is intended for use by trainers who have already completed a separate course in Participative Training Techniques (sometimes called a 'Training of Trainers' course).

In addition to experience of participative training techniques, PE trainers also need personal experience of using PE in the field. Ideally, trainers should have used PE in their work, be aware of the various methodological issues and have experience in handling data derived from participatory inquiry. This experience is necessary because a participative training approach requires trainers to encourage questions from participants and demonstrate methods. The trainer also needs to be confident and able to support trainees when they practice PE methods during the fieldwork. Trainers with limited experience of PE will struggle to meet these requirements.

The guide does not aim to provide a rigid and very detailed training programme that should be followed step-by-step or word-for-word, because PE training needs will vary according to location and organisational objectives. An experienced trainer should be able to adapt the guide accordingly.

The guide describes a **general, introductory training course in PE**. It provides training notes and ideas for trainers to help them to design and run a course. The notes assume

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that course participants are veterinarians. The introductory course includes sections on the principles of participatory inquiry, and attitudinal and communication issues.

An important initial stage when using PE is for researchers and practitioners to understand the relationship between community characterisation and naming of animal diseases, and western or English disease names. Without this understanding, the use of other methods such as seasonal calendars is problematic because these methods use local disease names - these names need to be interpreted with some confidence. The course uses matrix scoring as the key method for the initial characterisation of diseases, and this can be supported by semi-structured interviews.

The course then proposes the use of participatory mapping to investigate spatial factors, seasonal calendars to investigate temporal variations in diseases and disease vectors, and proportional piling to estimate disease incidence and mortality. Furthermore, information from each of these methods can also be used to cross-check (triangulate) information derived from earlier matrix scorings.

This is but one approach to using PE and there is considerable scope to adapt and re-sequence PE methods according to specific contexts and needs.

The guide includes a set of handouts to assist PE training (Annex 1) and a list of publications and resource materials (Annex 2).



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Chapter 2

Course Preparation

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00100 Nairobi

Kenya

Chapter 2 Course Preparation

This chapter outlines the general issues to consider when designing and planning a training course in PE.

The design and planning of a PE training course follows the basic principles and ideas of any participative training event. As mentioned in Chapter 1 PE Trainers should be familiar with participative training techniques. The book *Participatory Learning and Action: A Trainer's Guide* (Pretty et al. 1995) published by the International Institute for Environment and Development (<http://www.iied.org>) provides more detailed information and ideas on many of the issues described below.

Designing the Training Course

Course objectives

A crucial stage in any training course is to set clear and achievable course objectives. Also, at the end of the course it should be easy for both the trainer and trainees to determine whether the training objectives have been met.

One way to think about the course objectives is to first of all, list the topics that the PE course can cover. For example:

- Origins of participatory approaches and methods
- Key principles of PE
- Attitudes and behaviour for PE
- Indigenous knowledge on livestock health and production
- Triangulation in PE
- Methodological adaptation and flexibility
- Methods for PE:
 - Interviewing methods
 - Visualisation methods
 - Ranking and scoring methods
- Options for quantification and standardisation in PE
- How to present and feedback the information; when and how to apply statistical analysis
- Participatory disease searching
- Future training and practise needs of the trainees

This list of topics ensures that adequate attention is given to attitudinal and behavioural features of PE.

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This list of topics can be converted to course objectives that are written in an active form. An example is shown in Box 2.1.

Box 2.1 **Training Objectives from the Arusha PE Training**

At the end of the training course, the participants will be able to:

1. Describe the origins of participatory approaches and methods
2. Demonstrate the main attitudinal and behavioural aspects of participatory inquiry
3. Incorporate indigenous knowledge into animal disease investigation, research and surveillance systems
4. Use a range of PE methods correctly
5. Summarise, analyse and present data derived from PE
6. Describe the strengths and weaknesses of PE and community participation in animal disease control
7. Outline future PE training events for their own countries and institutions

Participative training approach and methods

A participative training course differs from a conventional training event. Participative courses recognize the limitations of lecture-based learning and therefore very few, if any, lectures are given. Instead, participative learning uses methods such as:

- group discussion (in large and small groups)
- practical demonstration followed by question and answer sessions
- practical sessions in the classroom followed by question and answer sessions
- group and individual exercises
- plays followed by discussion and questions
- practice sessions – in the field

The justification for using these methods is that participants can learn from each other. Examples of these methods are provided later in the guide, drawing on the Arusha PE Training.

A participative training course also tries to create a relaxed and open working environment in which participants feel confident to share their experiences without being criticized. Methods such as energizers and icebreakers are used to create a

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friendly and enjoyable atmosphere during the training. Again, examples are provided later in this chapter.

Session plans

A well-organised trainer makes a detailed session plan for each session. An example of a session plan from the Arusha PE Training is shown below.

Example of a session plan

Session objective: At the end of the session the trainees will be able to demonstrate how to use the matrix scoring method

Aim	Method	Timing	Materials
To introduce matrix scoring	Presentation	10 minutes	PowerPoint
To show trainees how to do matrix scoring	Demonstration	40 minutes	Cards, pens, counters
To enable trainees to practise matrix scoring	Practical work in groups	80 minutes	Cards, pens, counters, flip chart
To enable trainees to reflect on the practise session and critically analyse other groups	Group feedback with questions and answers	45 minutes	Flip charts and pens
To summarise and emphasise the key learning points	Summary presentation	5 minutes	Flip chart and pens

Total time required: 3 hours

From a combination of the overall course objectives and the session plans for each training session, the trainer can work out the total time needed for the course. The course outline for the Arusha PE Training is shown below.

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Table 2.1 Outline timing of the Arusha PE Training

Topic	Number of days
Course opening, welcome and introductions; expectations, fears and ground rules	0.5
Meaning of community participation - review participants' experiences	0.5
Introduction to participatory inquiry; attitudes and behaviour	0.5
Communications skills – verbal and non verbal communication	0.5
PE methods – managing groups, triangulation and other issues	0.5
PE methods – interviewing	0.5
PE methods – participatory mapping	0.5
PE methods – matrix scoring	0.5
PE methods – seasonal calendars	0.5
PE methods – proportional piling	0.5
Field work – planning	0.5
Field work – implementation	2.5
Field work – review	0.5
Handling data derived from PE	1.0
Participatory disease searching	0.5
Review of course objectives, course evaluation and official closing	0.5
Total	10

**Give yourself
enough time**

A single PE method requires half a day to teach. The teaching for each method involves a short, introductory presentation (around 10 minutes), followed by demonstration, practical sessions and feedback/group discussion.

Although participative training courses are widely recognised as being more effective than formal training methods, they also require more time. In particular, in a PE training course it is essential to allocate enough time to the general principles of participatory inquiry and community participation. Also, issues of verbal and non-verbal communication need to be included.

Most trainees in a PE course will be veterinarians. Some may initially feel that the general topics are a waste of time, and they will want to focus only on the methods of PE. However, PE methods cannot be used properly unless users are aware of and

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practise appropriate attitudes and behaviour. In other words, the right attitude and good communication skills are an integral part of PE methods.

Organising the Training

How many trainers and how many trainees?

In a participative training approach, the ideal number of participants is 15 to 20 people. A single trainer can manage this number of participants and provide the necessary support to practice sessions and fieldwork. Also, during group discussions, the group should not be so large that some people are reluctant to contribute. A group size of greater than 20 people is likely to limit the effectiveness of the training.

For a two-week training course, it can also be useful to use more than one trainer. Two trainers, particularly if they have different training styles, can help to keep the training lively. Also, if you are new to training, running a two-week training course on your own can be a daunting task. Working with another trainer helps to share the workload

Selecting the trainees

Participatory epidemiology is a field-based activity, often in more remote locations and requiring much interaction with livestock keepers. The participative training techniques used in PE training are designed to build on the existing knowledge and experience of the trainees. It follows that trainees with field experience and who enjoy communicating with others, tend to benefit most from PE training. Also, participative training techniques require trainees to take responsibility for their own learning, and invest time and effort in the training. Such commitment is more likely to occur if trainees feel that PE may be useful in their work, and that they will have the opportunity to apply what they have learnt. The selection of people for training in PE is usually the responsibility of managers within a particular organisation. Managers may not be fully aware of these issues and it is often useful for PE trainers to work with managers to select trainees.

Training materials

A PE training course does not require sophisticated training materials. The basic requirements are:

- Pre-prepared handouts (for example, see Annex 1) plus the course timetable
- Flipcharts and plenty of flip chart paper and marker pens
- Pieces of card
- Counters (e.g. stones, beans)
- Notebook, files and pens for participants

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Depending on the venue and equipment available, it is also useful though not essential to have an overhead projector or LCD projector (though both need a reliable electricity supply).

Creating a Learning Environment

People learn best when they're relaxed, but attentive. In other words, people don't learn well when they're apprehensive, bored or tired. A trainer can do various things to create a good learning environment.

The training venue

For the Arusha PE Training, the MS-TCDC was selected as a training venue because it was a purpose built training centre focussing on participatory approaches to development. The centre was well equipped with training equipment and able to offer specialised trainers to assist with the training course design and implementation. The centre was also able to organize fieldwork. On-site accommodation at the MS-TCDC also enables participants to concentrate on the training.

Ideally, training venues for PE training should be locations with relatively easy access to livestock keepers for practising PE approaches and methods. The greater the time dedicated to this practise, the more successful the course will be.

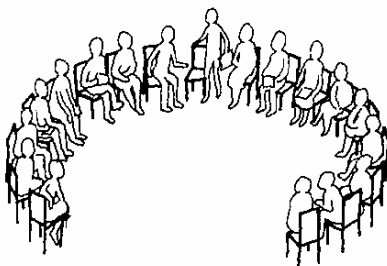
The training room

Trainees will spend a lot of time in the training room. This room needs to be large and 'flexible', so that desks and chairs can easily be moved around to cater for presentations and working group sessions. The room will need the usual visual aids and equipment such as blackboards or whiteboards, flipcharts and overhead projectors plus plenty of wall space to display various maps, matrix scorings and other methods and results as they emerge during the training.

Seating plans

The seating arrangement will also greatly affect the atmosphere and communication during the training. During the Arusha PE Training, most of the class work and group discussions took place in a meeting room at the MS-TCDC. This was a circular room and the seats were organized in a circle around a flip chart, marker boards and

projector screen at the front of the room. A circular arrangement places everyone at the same distance from each other and makes communication easy between the participants. Also, there is no table or lectern between the trainer, and therefore no barrier between the trainer and the participants.



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Opening the course

The opening of a training course can be conducted in a formal or informal manner. If officials are invited to open a training course, government protocol is usually appropriate. Typically, this involves formal seating arrangements and a speech by one or more senior officials or invited guests. After an official opening, it may be necessary to reorganize the meeting room into a more informal arrangement that is better suited to a participative training environment. For example, seating patterns should be organized to maximize communication between participants.

Icebreakers

In addition to creating a good physical environment for training, an important role for a PE trainer is to help people feel mentally relaxed and comfortable with the training. Important initial steps include exercises to make sure everyone knows each other, to get people interacting and used to talking in the group; these methods are sometimes called 'icebreakers'.

Box 2.2

Example of an icebreaker: Getting to know you

In this icebreaker, a blank piece of card is given to each participant. The trainer asks the participants to write three things about themselves on the card *but not their names*. The three things should not immediately give away the participant's identity, so that to someone reading the card it would not be obvious who had written it.

The trainer collects all the cards and places them on a table at the front of the room. Then, everyone is asked to come and choose any card other than their own and then using the card, find the person who wrote it.

Once everyone has found the owner of the card, the group is asked to take their seats again. Everyone is then asked to introduce the owner of the card they selected, using the information on the card.

There are many other icebreakers and trainers can get ideas and methods from *Participatory Learning and Action: A Trainer's Guide* (Pretty et al. 1995).

Expectations and fears

In a PE training course, it is useful for the trainer to understand the expectations of participants at the beginning of the course. This helps to identify any expectations that will not be covered by the course and inform people accordingly. In other words, false expectations are addressed at the beginning. Listing people's expectations also helps to ensure that everyone is clear about the objectives of the course, and which topics will be covered.

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Box 2.3

Expectations and fears in the Arusha PE Training

This session was conducted with the whole group of participants. The facilitator simply asked people to offer their expectations, and these were written on a flipchart. After the expectations had been discussed, the fears were then listed and also discussed.

In order to overcome some, or even all of the fears, the trainees can then propose some 'ground rules' for the training. The ground rules usually cover issues such as the timing of each session (when it will start and finish), breaks for tea and coffee, and punctuality. The trainees can also select a group representative to organize social events and present any problems to the course organisers.

Expectations

- * To learn the practical use of PE in the field
- * Acquire techniques to help farmers investigate livestock problems
- * Establish regional contacts with people interested in PE
- * Share experiences with colleagues in East Africa
- * Be able to pass on knowledge to colleagues who are not here
- * Integrate PE into national surveillance networks
- * Learn the latest developments in PE
- * Adopt PE as the main approach for working with pastoralists
- * Know how to integrate PE into the epidemiology curriculum in veterinary schools
- * Know how to combine PE with conventional epidemiological approaches

Fears

- * Not enough time for practical work
- * Wasting time during the course
- * Malaria
- * Change of environment and culture during the fieldwork
- * A tight timetable – will there be time for socializing?
- * Poor co-operation from other participants
- * Language barriers in the field
- * Attitude of some of us towards PE
- * Language problems internally in the group
- * Lack of harmonization regionally after the training
- * Bad weather (heavy rain)

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Preliminary exercises such as ice-breakers and discussing fears and expectations can be time-consuming. However, they help to ensure that participants feel that their opinions are influencing the design and atmosphere of the training. These initial stages of a PE training course differ from conventional teaching approaches, which usually begin with (and continue) with lectures right from the start of the training course.

Fieldwork in PE training

Why is fieldwork important?

To become a good PE practitioner, practice is needed. This means trying out new methods with 'real informants', learning the strengths and weaknesses of the methods, and developing capacity to adapt methods to suit particular situations. It follows that a PE training course must include enough time for fieldwork. At the end of a course, it is very common for trainees to say 'I never really understood how to use these methods until I did it myself'.

Fieldwork and community expectations

As fieldwork is such an important component of PE Training, it follows that the organisation of fieldwork is crucial. However, an important consideration when arranging fieldwork is the expectations of the community to be visited. Not least, if local people invest time working with the trainees, they may expect some form of assistance to result from the interaction. In the case of PE training, this expectation might take the form of treatments for sick animals. Whatever the case, it's important that false expectations are not raised.

If the PE training is related to a longer term process or project in a given area, such as a community-based animal health project, it can be one of the first stages in setting up the project. Although a training event, useful information can still be generated and discussed at community level. Alternatively, PE training might take place within an established project e.g. to investigate a previously unrecognised animal health problem. In these situations, it is relatively easy to explain to local people the reason for the training.

In many other situations, PE training will be a one-off event affecting a particular community. Neither the training organisation nor the trainees will have plans to return to the community and act on findings arising from the field work. In these situations, a golden rule is honesty. If livestock keepers clearly understand that the trainees are visiting an area in order to practise new approaches and methods, then they can better decide if they wish to spend time with the trainees. In areas where communities are highly dependant on livestock, it is common for people to be willing to sit and

Participatory Epidemiology: A Guide for Trainers

discuss livestock issues regardless of any obvious benefit (such as free veterinary medicines). Another approach in these situations is to include a livestock worker from the community in the training. This worker then becomes responsible for following up issues that arise during the practice sessions.

Fieldwork logistics

Having decided to conduct field work in a PE training course and considered the ethical questions related to community involvement, the field work needs to be organised. Box 2.4 overleaf summarises the main questions to ask when arranging the field work.

Practising the methods and feeding back

In addition to the logistical issues, the field work also has to be organised in terms of the methods to be practised and the information to be discussed. Therefore, the trainer needs to develop a session plan for the field work and ensure that enough time is available for practising each method. At this stage of the training, trainees should already have practised the methods in the classroom and so it should not be necessary for the trainer to repeat the demonstrations. Instead, the trainer can simply observe what happens as the groups practise the methods and only intervene if there is a major misunderstanding.

In the Arusha training, the trainees were divided into four groups of about five people, and each group practised the same methods on a particular day. Groups then presented their experiences and findings to each other in the evening. This approach allows trainees to identify what they did well and where they went wrong, and also allows comparison of results from different groups. These feedback sessions are also an opportunity for the trainees to correct each other, or if necessary, for the trainer to solve any misunderstandings.



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Box 2.4

A checklist for preparing for the field (from Pretty et al., 1995)

The Host Community

- Does the community know when you will be arriving and how long you will be staying? Have all sectors of the community approved your stay?
- Are the fieldwork dates convenient for all the local people? Are they busy all day with their animals or in the fields? When is market day? Are there important political events or social ceremonies that will draw people away?
- Do they know why you are coming?
- If it is just for training, then do they know there is no guaranteed follow-up? Will they still be interested in accommodating the teams?
- If it is part of the ongoing activities of the trainees' institution(s), then do they have resources to follow up plans developed in the village?
- When is it most convenient for women and men to be involved in discussions (morning, afternoon, evening)?

Accommodation

- Are you planning to stay in the village(s)?
- If so, have full discussions been held on practical arrangements in the community?
- If not, how close to the community will you be staying?
- Is there electricity? (If so, you may be able to show slides /videos to local people in the evenings.)

Food and Beverages

- What arrangements have been made to feed the team whilst in the village?
- Will you buy food there? Will you take it with you?
- Who will go to market to buy food and drink? Who will do the cooking?

Transportation

- How will the team get to the village sites?
- Do you have sufficient vehicles/fuel allocations?

Materials

- Do you have a full supply of charts, pens, paper etc. for the visualisations?
- Do you have a small notebook for each trainee?

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Evaluating the training

The evaluation of PE training can involve two processes:

Continuous evaluation of trainees

The frequent feedback and discussion sessions during PE training are an opportunity for the trainer to assess trainees' uptake of new knowledge or skills. These sessions will reveal areas of confusion within individual trainees or the group as a whole, and will also show which topics have been understood. This continuous evaluation enables a trainer to address major misunderstandings or provide additional support to individuals on specific issues.

Course evaluation by trainees

At the end of the training the trainees can be asked to complete a simple evaluation form. An example is provided in Annex 3.



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Chapter 3

General Principles of Participatory Epidemiology

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PO Box 30786

00100 Nairobi

Kenya

Chapter 3 General Principles of Participatory Epidemiology

This chapter presents ideas for introducing the basic principles of PE. The chapter is arranged as a series of training sessions which begin with the session objectives and an outline lesson plan.

Session: Community Participation

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Describe the origins of community participation as a development approach 2. Explain different types of community participation 	<p>Outline session plan:</p> <ul style="list-style-type: none"> ○ Reviewing participants' experiences of participation and constraints → group work (~ 60 minutes) ○ Why is participation important? → whole group session (~ 80 minutes) ○ Different types of participation → presentation and discussion (~ 40 minutes) <p>🕒 Total time required: ~ 3 hours</p>
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**Reviewing
past
experience**

The term 'community participation' means different things to different people. During a PE training course, discussion on community participation can be developed by asking trainees to think about their past experience when trying to encourage participation, and the problems they faced.

In the Arusha PE Training the trainer divided participants into groups by country and asked each group to consider two key questions.

Key question How have you promoted the participation of local people in your work?

Key question What are the main constraints that you have faced when trying to use participation?

The trainer summarized the group responses on a flip chart, as shown overleaf.

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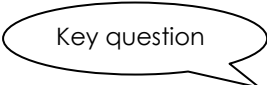
How have you promoted participation in your work?

Activity	Number of groups citing activity (total 7 groups)
Disease surveillance using interview/questionnaires	4
Community dialogue or village meetings	4
Sensitization/working with local administrations	4
Vaccination campaigns	3
Implementing CAHWS projects	3
Sero-surveillance	2
Providing disease information to farmers	2
Developing communication materials	2

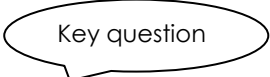
What are the main constraints that you've faced when using participation?

Constraints	Number of groups citing constraint (total 7 groups)
Lack of skills or sufficient staff trained in PE	5
Socio-cultural barriers	3
Language barriers	3
Lack of support from superiors/approach not accepted by them	3
Poor access to communities due to bad roads	3
Insecurity	2
Drought	2
Community has other priorities	2
Conflicting interests or manipulation	2

The trainer then used these responses as the basis for a group discussion and to probe understanding of community participation among the trainees. Such discussion can be prompted by asking the group to consider questions such as:

 Key question How do communities participate in disease surveillance if you are using a questionnaire?

When using participation, what are the specific skills which you think you lack?

 Key question

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Why is participation important?

Trainers can expand discussion on community participation by encouraging participants to reflect on why participation is important.

Examples of 'failed' projects due to poor participation can be provided and participants can be asked to offer their own examples. In the Arusha PE Training a livestock project in Papua New Guinea called the '100 to 1 Cow Project' was used as an example of a project that failed to meet its objectives. Participants were given a brief handout about this project and asked to read it (see Handout 1, Annex 1). They were then asked to describe projects that failed due to poor participation. Some of their experiences are presented below.

Why is participation important?

'I know of a project that tried to improve wells. The new wells meant that people no longer had to work together to draw the water and could collect water individually, any time they liked. But, people still preferred the old wells – they liked the fact that water collection was partly a social activity and this was lost with the new wells'.

'I was studying in the US and saw old library books being thrown away. I thought the books could be used in my own community back home in Uganda, and I tried to set up a library there. But for the people, a library wasn't a priority – they wanted a clinic not books.'

'I know about a project around Dar es Salaam that was donating animals to people living near the city. But these people had no knowledge of livestock rearing and the project failed'.

'I remember visiting sites where new housing had been constructed for returnees coming back to my country from Sudan. The area was a hot, lowland place and the new houses were designed with no ventilation and low, iron sheet roofs. Of course, the returnees families refused to live in the new houses and they remained empty'.

The trainer then asked participants to review the discussion so far and summarise the main the reasons why participation is important. The reasons were listed on a flipchart as follows:

- To avoid failure of projects/activities
- To improve effectiveness of our works and inputs

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- To ensure local commitment
- To enhance local ownership
- To recognise cultural sensitivity
- To improve sustainability
- To ensure that outsiders do not misunderstand needs
- To avoid duplication of activities
- To avoid wastage of resources

These experiences show how participants are usually very aware of the rationale for encouraging participation in development. By using Handout 2 (Annex 1), the trainer can then give a brief 10-minute presentation on the different approaches that influenced the emergence of community participation. But are there different kinds of participation and if so, how can participation vary in different projects?

Types of community participation

The trainer can use the typology of participation (see Handout 3, Annex 1) to prepare a short presentation on different types or levels of participation. This presentation need last no more than 10 minutes and can build on, and refer to experiences cited by trainees in the previous sessions. Participants can then be asked to suggest examples to illustrate these different types of participation from their own work or knowledge of other projects or sectors.

A key point for the trainer to highlight is that the type of participation in a particular project has a strong influence on the sustainability of the project - the greater the involvement of local people and contribution of resources, the better the sustainability.



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Session: Introduction to Participatory Epidemiology

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Describe the basic concept of PE 2. Explain the main differences between qualitative and quantitative methods 3. Describe the three main groups of methods used in PE 4. Explain the concept of triangulation 	<p>Outline session plan:</p> <ul style="list-style-type: none"> ○ What is PE? ➔ brainstorming session (~ 20 minutes) ○ Experiences with qualitative and quantitative methods ➔ whole group session (~ 30 minutes) ○ The three groups of PE methods ➔ presentation (~ 20 minutes) ○ Triangulation ➔ brainstorming and discussion (~ 20 minutes) <p>⌚ Total time required: ~ 90 minutes</p>
---	---

What is participatory epidemiology?

In the Arusha PE Training, an initial brainstorming session was used to gauge participants' understanding of the term 'participatory epidemiology'. The facilitator wrote the following question on a flip chart and invited participants to offer their ideas.

Key question:
What do you understand by the term
'participatory epidemiology?'

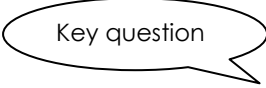
Responses from participants

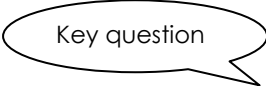
- 'A way of sharing information on health and disease in the context of a given environment'
- 'Epidemiological studies using participatory tools, which is more qualitative'
- 'Involvement of everybody in epidemiology and making use of local and expert knowledge'
- 'Doing epidemiological studies using professionals as facilitators or participation of farms at different stages of the study'
- 'An approach that involves stakeholders in identifying problems, collection, analysis of data and taking action based on information'
- 'Analyzing disease information using PRA methods and incorporating indigenous knowledge'
- 'Method of understanding the situation in a locality from the community themselves'
- 'Using participatory methods to gather disease situation from the community'

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This listing of responses can be followed by a brief explanation from the trainer. A handout can be used to provide further information (e.g. Handout 5, Annex 1).

This exercise was followed by group work. Each group was asked:

 Key question What qualitative and quantitative methods have we used in our work?

 Key question What are the strengths of these different methods?

Some of the opinions of the groups are summarized below:

Interviews

Get explanation on spot.
Can cross check information.
Local expertise used.

Questionnaires

For specific information

Meetings

Wide scope of information is obtained

Literature review

Secondary data obtained

Research

Quality information obtained

Surveys

Get quantifiable data

Reporting

Continuous source of data

Networks

Share/exchange vast information
faster

Conference/seminar

Exchange varied information

Transect walk

Reliable information

The trainer can use this session to lead into a presentation to give an overview of the three main groups of PE methods viz. interviewing methods, visualization methods and ranking or scoring methods. Handout 7 (Annex 1) can be used here.

At this stage of the training, specific methodological details should be avoided – these will be covered later on in the training.

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Triangulation

The concept of triangulation can be introduced using a brainstorming session using the question.

Key question

What is triangulation?

If necessary, the trainer can then provide a definition of triangulation such as:

'In PE triangulation is the process of cross checking information using different methods and sources.'

Handout 7 (Annex 1) includes a visual representation of triangulation. A trainer can highlight the point that in PE, triangulation need not be confined to comparison of information from PE methods. It can also include use of information from the literature or conventional veterinary methods, such as clinical examinations and laboratory tests.

To ensure that participants have understood this concept, the trainer can ask people to offer examples of triangulation as follows:

Key question

Suggest example from everyday life where you use triangulation

Key question

Suggest one common veterinary use of triangulation

In the Arusha PE Training, the following examples were offered by the trainees:

Examples of triangulation from everyday life

'Before buying an important item, I check the price in different shops'

'I compare the news on the radio with the news in a newspaper'

'When my children break something in the house I have to be a detective to find out who was responsible. I ask different people to try to get the culprit'

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Example of triangulation in veterinary medicine

'During diagnosis you triangulate because you use different methods, such as clinical examination and interviewing'

Session: Attitudes and Behaviour for Participatory Epidemiology

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Explain the role of indigenous knowledge as the basis for PE 2. Demonstrate different types of non verbal communication and understand their importance in PE 	<p>Outline session plan:</p> <ul style="list-style-type: none"> o What is our attitude towards indigenous veterinary knowledge? → group work (~ 45 minutes) o PE and non verbal communication → presentation (~ 5 minutes) o Types of non verbal communication → plays (~ 60 minutes) and photographs (~20 minutes) <p>🕒 Total time required: ~ 130 minutes</p>
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This is a crucial part of the training and should not be rushed or overlooked. Trainers can refer to Handout 6 (Annex 1) and prepare a 5 minute presentation on attitudes and behaviour.

Attitudes on indigenous veterinary knowledge

An important aspect of participatory approaches is the way we interact with other people. This interaction determines the relationship and trust that develops between researchers and local people, and affects the types of issues and information that people are willing to discuss in an open manner.

If we look at this issue from an epidemiological perspective, the relationship between researchers and livestock keepers is a key factor affecting the reliability and validity of data. If informants are concerned that researchers have a 'hidden agenda', will use the information solely for selfish purposes or may pass information to authorities, then their participation will be poor. Also, if informants consider outsiders to be rude or arrogant, or only interested in their own opinions, the discussion will not be very constructive.

Therefore, a crucial feature of participatory epidemiology is that outsiders must be constantly aware of their own attitudes and behaviour.

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From the perspective of meaningful interaction, researchers must believe that an informant has something useful to say. This means respecting local views and opinions, and being open to ideas that may not necessarily agree with modern science. This does not mean that as veterinarians, we must automatically accept all indigenous knowledge as valid and useful. The idea is to identify local knowledge and skills that seem to agree with our professional know-how, and explore this local knowledge.

A participative training method for raising awareness of the participants' personal attitudes towards indigenous knowledge is to use an exercise called 'Traditional beliefs and practices'.

Box 3.1

How to run a discussion session on Traditional Beliefs and Practices

Divide the group into smaller groups comprising three to five people. Ask each group to think about their home areas and communities. In these communities, ask them to describe traditional beliefs or practices that fit into the following categories:

Traditional practices or beliefs that,

1. Are popular but cannot be explained scientifically. Local people insist that these beliefs or practices are valid.
2. Are popular and agree with scientific knowledge.
3. Are used and may even be popular, but according to western science, would be harmful.

Give the groups about 15 minutes to think of their examples and to list them on flipchart paper. Then, ask each group to present their examples to the others.

Typically, this exercise highlights examples of traditional knowledge that fit modern veterinary thinking. It follows that popular but non-validated knowledge should not always be rejected, as such knowledge might be validated in future. There are many examples of hypotheses about animal diseases arising from observations made by livestock keepers. The trainer can present some of these examples to participants and prompt further discussion regarding the dangers of overlooking local knowledge.

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Examples of indigenous veterinary knowledge validated by veterinarians

- Maasai knowledge on links between malignant catarrhal fever and wildebeest
- Dinka diagnosis of CBPP
- Somali diagnosis of CCPP
- Somali diagnosis of surra in camels
- Maasai diagnosis of rinderpest
- Orma diagnosis of bovine trypanosomiasis

Non verbal communication

Two simple methods for training non verbal communication are plays and pictures. These methods can be run consecutively.

Box 3.2 **Using plays to show non verbal communication**

In the Arusha PE Training the 24 participants were divided into four equal groups. Each group was asked to move away from the other groups, and was then visited in turn by the trainer.

The trainer asked the first group to think of three ways to demonstrate submissive behaviour *without talking to each other*. It was explained that they would be required to act out three types of submissive behaviour to the other groups, who would then have to guess what kind of behaviour was being shown.

A similar task was given to the other three groups, who had to demonstrate three ways of showing boredom, arrogance and friendliness. In all cases, the groups were not allowed to speak during the demonstration.

Following these plays, other issues related to non verbal and verbal communication were discussed with facilitation by the trainer. These issues included:

Gender and culture

How is it best to approach women? How can we include women in cultures where it is difficult for outsiders to talk to women? If women are often busy, when is the best time to talk to them?

Seating arrangements

How can we avoid being seated as though we are officials, behind desks or at a level higher than everyone else? How can we understand local customs or arrangements for seating? How can we rearrange seating to avoid causing offence but also improve communication within the group?

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A play showing submission



*Even the way we walk gives off messages.
This is an 'arrogant walk'.*



Rejection or boredom?



A friendly group

How to handle food and drink

Should we always share our own food and water with people in the village? How do we handle offers of food or drink if we don't like what they offer us? If you go to some communities, you must drink milk with them if you want to be accepted

The importance of eye contact in communication

Make eye contact except when talking across gender. When talking to the whole group, engage the whole group rather than individuals. Sometimes eye contact is interpreted as a challenge. In different cultures, eye contact means different things

The way we dress

Be aware that we can dress too formally and this intimidates. Middle ground is best – not too scruffy and not too formal. Also, be aware of obvious demonstrations of wealth, such as gold jewellery, expensive fabrics and watches.

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Box 3.3

Using photographs and sketches to show non verbal communication

The trainees' understanding of non verbal communication can be reinforced by a discussion session with the whole group using photographs or sketches. The trainer simply distributes each photograph in turn and asks people to call out anything they see in photos related to good and bad aspects of communication. The photographs can show different types of interviewing, seating arrangements or interactions between people. This exercise requires the trainees to look very closely at the pictures and think about how communication can vary.

What do you see? Examples of photographs used in the Arusha PE Training are copied below.



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Session: Managing Ourselves and Others

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Explain the importance of team management and co-ordination when using PE 2. Describe how to manage informant groups when using PE 	<p>Outline session plan:</p> <ul style="list-style-type: none"> o How do we work as a team? ➔ Rope square game (~ 30 minutes) o Managing groups: giving clear instructions ➔ Folding paper game (~ 10 minutes) o Managing groups: dominant talkers ➔ plays (~ 60 minutes) and photographs (~20 minutes) <p>⌚ Total time required: ~ 130 minutes</p>
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How do we work as a team?

An energizer such as the rope square game can be used to introduce this session.

Box 3.4

The rope square game

The trainer uses a rope, about 2m in length and tied once to form a loop. The rope is placed on the floor.

The trainer then asks for 5 volunteers and tells them to stand in a circle around the rope. The trainer then gives the volunteers the following instructions:

1. Close your eyes and do not open them during the game.
2. Bend down and touch the rope.
3. As a group, make a square.
4. Only open your eyes when as a group, you're confident that you've made a square.

During the game, the other trainees are asked to observe what happens during the game.

The rope square game was used during the Arusha PE Training and the following behaviour was noted:

- Initially, the 5 group members did not speak to each other. They either forgot to speak or wrongly assumed that they were not allowed to speak.
- When they did start talking to each other, their task became easier. However, everyone was talking at once and there was confusion.
- Eventually, one person took the lead and the other group members followed this person's instructions. From then on, the group was better organized and was able to complete the task.

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The game illustrated the importance of group organization and leadership when working as a team. Each person in a team must have assigned roles and during the exercise, adhere to these roles. If a team is poorly organized and confused, onlookers will observe these weaknesses and lose confidence in the team.

The trainer can refer to Handout 8 (Annex 1) which suggests some specific roles for different team members.

Managing groups

Many PE methods are used with groups of informants. Therefore, PE practitioners need to be skilled at organizing group work and managing groups. They also need to explain clearly what they want people to do when using methods such as matrix scoring, mapping and other methods.

Box 3.5

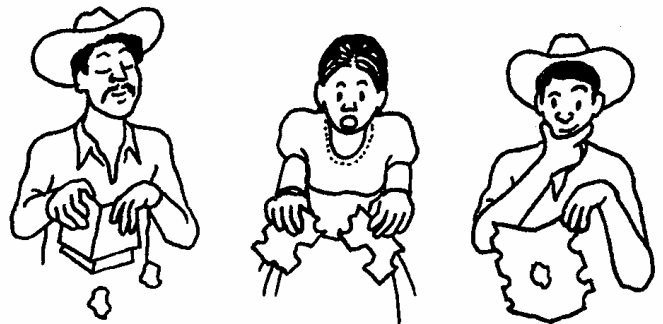
The importance of clear instructions: the folding paper game

Select 4 volunteers and ask them to stand facing the rest of the group. Give each volunteer a blank, square piece of paper around 20cm square and then provide the following instructions:

1. Close your eyes.
2. You may not ask questions.
3. Fold the paper in half and tear off the bottom right corner.
4. Fold the paper in half again and tear off the top right hand corner
5. Fold the paper in half again and tear off the bottom left corner.
6. Open your eyes, unfold the paper and show it the rest of the group.

Usually, the pieces of torn paper are completely different shapes.

This game shows that although verbal instructions may appear simple and the same instructions can be given to different people, they can be misinterpreted. It follows that guidance on how to conduct a particular PE exercise needs to be very clear and practiced beforehand to check that instructions are easy to understand. This 'testing' the instructions is even more important when using a translator.



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Dealing with dominant talkers

One of the most common challenges during group sessions is the handling of 'dominant talkers'. Dominant talkers include people who simply talk frequently or loudly, and remain insensitive to whether their views are relevant or interesting to others.

Dominant talkers can also be local leaders or professionals who feel that their views are the only opinions that matter.

Sometimes, dominant talkers can be useful informants. If they are leaders, their knowledge can be very useful. However, when these people prevent others from participating in a group discussion or exercise, they need to be managed in order to allow wider participation.



To raise understanding of dominant talkers, the trainer can prepare a short introduction based on the notes above. The trainer can then run a brainstorming session and ask participants to call out ways to handle a dominant talker.

Experiences from the Arusha PE training

The participants in the Arusha PE Training suggested the following ways to handle a dominant talker:

- Divide the group into smaller groups and disperse the groups to different places.
- Direct questions at particular individuals. If the dominant talker interrupts, say something like *'Thanks for your useful contribution. We can now hear what other people have to say'*.
- Assign a physical task to the dominant talker to distract them.
- During a discussion on animal health, say to the dominant talker, *What you've told us is very interesting. It would be good to see some of your animals and talk more about the problems you've mentioned'*. One of the

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team then goes with the person to visit their animals, thereby separating the person from group without causing offence.

- Stop the discussion and resume later.
- Make the dominant talker part of the team.



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Chapter 4

Useful Methods for Participatory Epidemiology

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PO Box 30786

00100 Nairobi

Kenya

Chapter 4 Useful Methods for Participatory Epidemiology

Session: Informal Interviews

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Describe different types of informal interviews used in PE 2. Describe good interview technique 3. Explain the difference between open, closed and probing questions 4. Demonstrate an effective informal interview 	<p>Outline session plan:</p> <ul style="list-style-type: none"> ○ Presentation on different types of informal interviews for PE ➔ whole group (~ 15 minutes) ○ Brainstorming session on 'barriers to good interviewing' ➔ whole group session (~ 30 minutes) ○ Types of questions ➔ individual question list exercise (~ 15 minutes) ○ Mock interviews ➔ presentation and discussion (~ 40 minutes) <p>🕒 Total time required: ~ 3 hours</p>
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Barriers to interviews

For this session the trainer can refer to Handout 10 and prepare a 15 minute presentation on the key features of informal interviews used in PE.

The presentation can be followed by a brainstorming session on 'barriers to good interviewing'. Participants are asked to call out factors that will inhibit good communication between interviewer and informant.

Examples of barriers to good interviewing from the Arusha PE Training

- Asking very direct or aggressive questions.
- Pretending or lying on the part of the interviewer
- Interruption by the interviewer
- Asking complicated questions
- Using technical terms
- Mixing languages
- Ambiguous questions
- Leading questions
- Compound questions
- Sensitive questions
- Irrelevant questions

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- Repetitiveness

A question with an obvious answer - a trainer can use cartoons to reinforce messages about different types of questions



Types of questions

During the brainstorming some trainees mention the use of inappropriate questions as a barrier to good interviewing. This issue can be followed up using an exercise in which trainees are asked to categorise questions, described in Box 4.1.

Box 4.1
Individual question list for types of questions

This exercise uses a pre-prepared list of about 15 different types of questions, given as a handout to each trainee. The trainees categorise each type of question using categories such as 'closed', 'open', 'leading', 'probing', 'ambiguous', 'sensitive' or 'compound'. A shortened example of the handout is shown below

Question	Type
<i>Do you ever visit the veterinary clinic?</i>	Trainee to add their answers here
<i>Why do you prefer to keep sheep rather than goats?</i>	
<i>How many cattle do you have?</i>	
<i>It's interesting what you say about anthrax – can you tell me more about it?</i>	
<i>How many times have you vaccinated your chickens in the last few years?</i>	
<i>For camels aged 0-1, 1-3 and more than 3 years old, tell me how many died of Pasteurella infections last month in this area.</i>	

Trainees completed their categorisation of the questions, and then the answers are discussed in a whole group session.

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The exercise outlined in Box 4.1 helps trainees to think carefully about how questions can easily lead or confuse people.

PE often uses semi-structured interviews based on open and probing questions. The discussion can be developed further by providing trainees with examples of closed or leading questions, and then asking them to rephrase the questions as open or probing questions.

Examples

The question *'How many times did you visit the veterinary clinic last year?'* can be rephrased as *'Last year, what did you do if your animals became sick?'*

The question *'Do you use oxytetracycline to treat CBPP?'* can be rephrased as *'How do you treat cattle with somba?'*

Practical work

As interviewing is such an important method in PE, the training should include time to practise interviewing technique. A practical exercise is described in Box 4.2

Box 4.2 **Practising semi-structured interviews**

Divide the trainees into groups of 4 to 5 people. Ask 2 or 3 people in the group to play the role of livestock keepers and the other 2 people act as interviewers.

The trainer should visit each group of interviewers in turn and give them a specific topic to investigate using a short, semi-structured interview. Handout 10 (Annex 1) covers this issue. Suitable topics might be 'Sudden death in cattle', 'Diarrhoea in calves', 'Fair prices for veterinary drugs' and so on.

The interviewers have to prepare a checklist and then conduct the interview in front of the other participants. The participants watch the interview and then comment on the good and bad points of the interview.

This exercise can be made more interesting if the trainer asks the 'livestock keepers' to act in particular ways. For example, some could be unfriendly, others could be bored while a third group could be suspicious of the interviewers.

During fieldwork, trainees will have further opportunities to practise informal interviewing methods.

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Session: Participatory Mapping

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Explain the role of visualisation methods compared with verbal methods in PE 2. Describe uses of participatory mapping in PE 3. Demonstrate how to do participatory mapping 	<p>Outline session plan:</p> <ul style="list-style-type: none"> ○ Presentation on participatory mapping ➡ whole group (~ 20 minutes) ○ Practical mapping ➡ in groups (~60 minutes) ○ Presentation of maps and discussion ➡ (~60 minutes) ○ Summarise key points ➡ presentation (~5 minutes) <p>🕒 Total time required: ~ 2.5 to 3 hours</p>
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The trainer can refer to Handout 11 (Annex 1) to prepare the initial presentation for this session. The handout is given to participants after the presentation.

Key points to make during a presentation are:

- Spatial information on livestock distribution, movements, interactions, diseases and disease vectors is extremely useful in epidemiology
- Some information is easier to describe and analyse visually than in written form. It is easier to draw a map than describe a map in words
- Mapping is useful at the beginning of an inquiry to define the spatial boundary of the system under investigation. It also acts as a good ice-breaker as many people can be involved
- Maps produced on the ground using locally-available materials are easy to adjust until informants are content that the map is correct
- Maps do not need written words or labels, and therefore non literate people can participate

Participants should be given guidelines on how to facilitate participatory mapping (see Handout 11).

The second stage of the session involves practical work. Most PE training will take place in a training centre or other institution which has support staff such as secretaries, watchmen, cleaners or canteen workers. These staff can be used as informants during a practical mapping exercise.

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Practical work

Divide trainees into groups of around 3 to 6 people. The groups are asked to find an informant(s) in the training compound and ask them to produce a map of the compound. Handout 11 provides guidelines on how to do this.

Each group is given the same task. For example, if there are 5 groups, 5 separate maps should be produced.

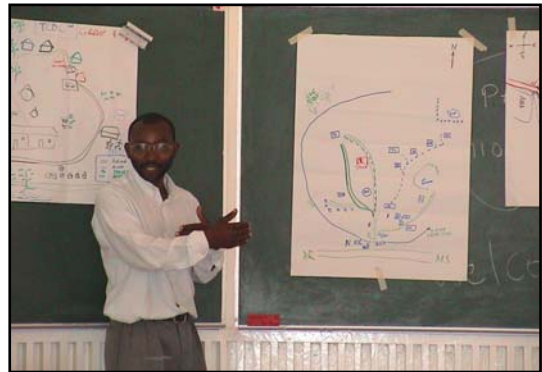
Ask the groups to copy the maps on to flipchart paper and be ready to explain the maps to the other participants. Give them about 1 hour to complete the mapping.

Group presentations

Group presentations and feedback sessions are an important component of PE training courses. They allow people to share their results with other participants, and explain the process that led to the results. This includes problems they came across when using a particular method.

These sessions allow participants to ask questions and identify strengths and weaknesses relative to their own experiences.

A trainer should allocate about 10-15 minutes presentation time per group



Some of the discussion points that arose during the presentations at the Arusha PE training were:

- *Which way is north? The map should show orientation.*
- *Who produced the map? The names of the informants should be written on the map.*
- *Should the map have a scale? In either km or time taken to traverse the area covered by the map.*

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Session: Matrix Scoring

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Describes the uses of matrix scoring in PE 2. Demonstrate how to do matrix scoring 	<p>Outline session plan:</p> <ul style="list-style-type: none"> o Presentation to introduce uses of matrix scoring ➡ whole group (10 minutes) o Demonstration ➡ whole group (~50 minutes) o Practical work ➡ in groups (~90 minutes) o Group presentations with discussion ➡ whole group (~60 minutes) o Summarise key points ➡ presentation (~5 minutes) <p>⌚ Total time required: ~ 2.5 to 3 hours</p>
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The trainer can to Handout 12 (Annex 1) for background information on the uses of matrix scoring for PE. The handout can be used to prepare a very short presentation (no more than 10 minutes) to introduce the method.

Demonstrate the method

The matrix scoring method can be taught by demonstration followed by practical work in groups. A good way to demonstrate the method is to select a non-veterinary topic and use matrix scoring to understand the topic as part of a demonstration.

In the Arusha training, the trainer was aware that three of the participants were from Eritrea and that in Eritrea, a staple food is fermented, flat bread called *injera*. The trainer was also aware that *injera* could be prepared from different types of grain. The trainer acted the role of a nutritionist wishing to learn about the different types of *injera*. He was helped by an assistant who acted as the note taker for the exercise. The Eritrean participants were asked to act as informants for the exercise.

Matrix scoring involves three main stages – a pair-wise comparison followed by the scoring of items and indicators, and finally, 'Interviewing the matrix'. Therefore the demonstration was also arranged in three main stages as follows.

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Stage 1: Pair-wise comparison of the different types of injera

Nutritionist *I understand that in Eritrea, injera is an important food. Can you tell me the different types of injera which are eaten?*

Informants The informants named different types of injera as follows – teff (brown variety), teff (white variety), maize, sorghum, millet and mixed grain types.

Nutritionist The nutritionist knew that the informants were literate and wrote the different types of *injera* on separate pieces of card. He selected two cards representing teff and sorghum, and then asked the question: *Which of these two types of injera do you prefer? Discuss as a group and tell me your preference.*

Informants The informants discussed the question and then stated that they preferred *injera* made from teff.

Nutritionist *Why do you prefer injera made from teff? Again, please discuss as a group and explain your preference for teff.*

Informants After a few minutes discussion, the Eritreans began to list various reasons why they preferred teff to sorghum *injera*. These reasons were recorded by the note taker and were termed 'indicators'.

The nutritionist then selected another two cards and repeated the 'preference' question and the 'why' question. All the responses from the informants were recorded. The recorder also made notes on the discussion that takes place.

Further pairs of cards were selected and for each pair, the informants were questioned.

As this process continued, the informants began to exhaust their knowledge of *injera* and their reasons for preferring one type over another type began to be repeated. At this point, the nutritionist moved on the stage 2 of the demonstration

Participatory Epidemiology: A Guide for TrainersStage 2: Scoring of indicators against the different types of injera

The nutritionist laid the six cards representing each type of *injera* in a row on the ground.

He then took the first indicator provided by the informants called 'palatability' and wrote 'palatability' on a piece of card. He provided them with a pile of 30 stones and asked them to assign stones to the different types of *injera* to show the relative palatability. In other words, the more palatable a particular type, the more stones to be assigned to it. He also requested them to use all 30 stones.

When the informants had discussed among themselves and placed the stones, the nutritionist asked if they all agreed on the scores assigned to each type of *injera* and gave them an opportunity to change their scores if they wished. The final scores were recorded and the stones left in place on the floor.

The nutritionist then selected the next indicator 'cultural preference' and asked the informants to score this indicator, also using a new set of 30 stones. The scoring procedure was repeated with each indicator. The final matrix is shown below, with the numbers being the number of stones in each 'cell' of the matrix.

Indicator	Types of <i>injera</i>					
	Maize	Teff (brown)	Teff (white)	Millet	Sorghum	Mixed
Palatability	3	6	8	3	4	5
Cultural preference	3	6	8	3	6	4
Nutritional value	4	7	5	7	4	6
Low cost	7	3	2	6	8	4
Ease of preparation	4	7	9	5	5	3

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Some important points for the trainer to emphasise are:

Patience - the nutritionist was patient. He didn't interfere with the discussion or try to hurry the informants.

Avoid 'correcting' the results - it is a common mistake for researchers to try to 'correct' the scores and give their opinions. Sometimes, this quickly develops into the researcher lecturing the informants about the 'right' answer. It is not the role of the researcher to offer their views, but further questioning can be used later to probe interesting scores in the matrix - see stage 3.

Column totals – note that in the above example using *injera* the column totals for each type of *injera* were not summated to give an overall score for each type. This was because the indicators probably varied in importance or had different 'weights'. It is possible to ask informants to weight the indicators by dividing a pile of counters against the indicators. When the weighting is applied to all the scores in the matrix, this can lead to a more accurate overall score for each item. However, it also complicates the method. As explained in Handout 12, matrix scoring can be used to understand local characterisation of diseases before using other participatory methods such as seasonal calendars or proportional piling. With this approach, the indicators are disease-signs and disease-causes, and summating the scores for each disease has limited value.

Stage 3: Interviewing the matrix

The third stage of the matrix scoring demonstration involved 'interviewing the matrix'. At this stage, the entire matrix is visible on the ground and the relationships between the types of *injera* and indicators clearly seen. Therefore, the matrix is used as the basis for further discussion facilitated mainly by open and probing questions.

For example, the nutritionist asked questions such as:

Tell me more about the meaning of the indicator 'cultural preference'

If teff injera is the most expensive and also difficult to prepare, why is it rated so highly from a cultural perspective?

As men rarely prepare injera, how do you know which types are difficult to prepare?

This type of questioning reveals more information about the scores and opens up areas of discussion. The responses to these questions are part of the method and are recorded by the note taker.

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Following the demonstration, participants asked questions about the method:

Why use 30 stones?

The number of stones used should be large enough to show differences between the types of *injera*, but not so large that counting the stones becomes too time-consuming. Around 5 stones per item being scored is usually a manageable number.

What happens if the informants have many types of injera, say 10 or more?

The method will work with more items to be scored, although the time required for the method will increase.

Similarly, what happens if a very long list of indicators is produced during the pair-wise comparison? Should all the indicators be scored?

A very long list of indicators may make the method boring. It is probably best to limit the indicators to no more than 15. Use indicators that are mentioned frequently during the pair-wise comparison or, ask the informants to rank all the indicators before scoring and select only the most important indicators.

What happens if the informants are illiterate?

As informants are often illiterate, researchers must use symbols or everyday items to represent the various diseases. The meaning of the symbols requires patient explanation to informants so that everyone is clear about which symbol represents which disease. Similarly, indicators can be sketched on to pieces of card. Again, the sketches need to be carefully explained to the informants (also see Handout 9, Annex 1).

Practical work

Divide the participants groups, each group with 4 to 5 participants. Within each group, ask some people to act as livestock keepers and other people to act as researchers. The idea is to set up mock situations where researchers with no knowledge of local disease names are required to use matrix scoring to understand livestock keepers' perceptions of diseases.

For example, in the Arusha training Group 1 contained two vets with experience in southern Sudan. The trainer asked these two vets to play the role of livestock keepers. The researchers in this group were from Eritrea and were given a set of written instructions as follows:

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You are visiting Bahr el Ghazal in southern Sudan. Some livestock keepers have told you that the following 5 cattle diseases are important: *luek*, *aboutpou*, *lie*, *jul*, *cual*. Your task is to use matrix scoring to understand how local people describe and distinguish between the 5 diseases. The informants are illiterate. You have 1 hour to complete the task and prepare results on a flip chart.



Similar tasks were given to the three other groups:

Group 2: Two Ethiopian participants played the role of highland Ethiopian farmers. They were 'visited' by researchers from Kenya and Uganda who used matrix scoring to understand the cattle diseases called *desta*, *samba*, *aba gorba*, *afte jajir* and *gendi*.

Group 3: Two Somali participants played the role of Somali pastoralists. They were visited by researchers from Sudan and Uganda, who used matrix scoring to understand camel diseases called *gendi*, *muglo*, *cadho*, *kud* and *furuq*.

Group 4: A Kenya participant played the role of a Turkana pastoralist. He was visited by researchers from Tanzania and Belgium who wished to study the cattle diseases called *lokiyo*, *lokichum*, *lokipi*, *loukoi* and *nginadam*.

Group presentations

Each group should summarise their results on a flip chart and present findings to the other groups. An example is shown overleaf. Five diseases are represented using common, everyday objects placed along the top of the matrix. The group has sketched disease signs down the left side of the matrix.

During the practical work, each group of researchers will begin to form opinions regarding the modern veterinary interpretation of the local disease names. Therefore, the diagnostic value of the method will become apparent.

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Example of matrix scoring presentation

	8	9	6	4	3
	0	0	18	12	0
	3	2	0	25	0
	0	4	4	6	16
	7	7	1	13	2
	0	0	0	2	28
	6	10	8	6	

In the Arusha PE training, some lessons from the feedback presentations were:

Be clear about the instructions given and questions to be asked

An important aspect of matrix scoring (and other PE methods) is for researchers to prepare and test the instructions they'll use in the local language of the informants. Explaining to people that you'd like them to divide a pile of counters to show the relative importance of an indicator (e.g. coughing) against five diseases is potentially confusing. For example, what is the meaning of 'importance'? Taking the example of 'coughing', importance could mean that coughing is observed in many animals suffering from the disease. A matrix based on this form of questioning reflects the frequency of observed signs for the different diseases. Alternatively, importance of coughing could be interpreted as the severity of coughing in individual cases. A matrix based on this form of questioning reflects the severity of signs for the different diseases. When using matrix scoring to understand local characterisation of diseases, it probably doesn't matter too much which form of questioning is used. However, it is important for the researchers to be clear about the questions being asked and why. Also, if the method is to be repeated with different groups of informants to compare opinions, the questioning should be constant.

Working with illiterate informants

During the practice session, all 4 groups initially overlooked the illiteracy of the informants. They used written labels to represent the diseases and indicators – these

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labels would be meaningless to illiterate informants and would isolate them from the method. The trainer advised each group to produce symbols and diagrams to represent each disease and indicator, and carefully explain these diagrams to the informants.

Let the matrix 'grow' on the ground

One group scored each indicator in turn and removed the stones immediately after each scoring. Therefore, a matrix did not emerge visually on the ground – at the end of the scoring there no matrix to interview.

Session: Seasonal Calendars

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Describes the uses of seasonal calendars in PE 2. Demonstrate how to construct a seasonal calendar with informants and 'interview the calendar' 	<p>Outline session plan:</p> <ul style="list-style-type: none"> ○ Presentation to introduce uses of seasonal calendars ➔ whole group (10 minutes) ○ Demonstration ➔ whole group (~50 minutes) ○ Practical work ➔ in groups (~90 minutes) ○ Group presentations with discussion ➔ whole group (~60 minutes) ○ Summarise key points ➔ presentation (~5 minutes) <p>⌚ Total time required: ~ 2.5 to 3 hours</p>
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Trainers can refer to Handout 14 (Annex 1) for background information on the uses of seasonal calendars in PE. This handout can be used to prepare a very short presentation (of no more than 10 minutes) to introduce the method.

Demonstrate the method

The construction of a seasonal calendar involves three main stages:

- learn the local definitions of seasons i.e. the names of seasons in the local language, and relate these names to English names for months or seasons
- score rainfall, diseases, disease vectors or other indicators against the local names for seasons
- interviewing the seasonal calendar

The seasonal calendar method can be taught by demonstration followed by practical work in groups. Identify a trainee with particular knowledge of certain community and

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their language. Ask this person to act the role of a livestock keeper (the informant) from this community.

Stage 1: Identify local names for seasons

Draw a line on the ground about 1m in length and explain to the informant that the line represented one full year. Ask the informant to divide the line to show the various seasons in the year.

In the example below, the informant was a Samburu pastoralist from Kenya. The line represents the Samburu year by season; there are six seasons.

<i>Ingerngerua</i>		<i>lamei dorop</i>		<i>lorikini</i>		<i>lamei dorop</i>		<i>Itume</i> <i>-ren</i>	<i>lamei</i> <i>oodo</i>		
Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb

Stage 2: Scoring of rainfall, diseases and other indicators

Ask the informant to think about rainfall and how rainfall varies according to season. Give them a pile of 30 stones (in this example, 6 seasons x 5 stones = 30 stones) and ask them to divide the stones to show the seasonal pattern of rainfall (the higher the rainfall in a particular season, the more stones to be assigned to that season). All the stones should be used.

When the rainfall pattern had been shown using the stones, check that the informant was confident that the stones were in the correct place. Give them a chance to change the pattern if they wish. Then record, *but do not remove*, the numbers of stones for each season.

Diseases, disease vectors or other indicators can then be scored against the seasons using the same scoring method as for rainfall. At this point, the researchers need to be clear about the questions to be asked and should have pre-prepared and tested the questions in the local language. Often this also means working with translators to clarify the questions before going to the field.

- If, as an epidemiologist, you are trying to understand seasonal variations in disease incidence you'll have to think carefully about the question to be asked when informants are scoring the diseases against season. Is the task to:

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'Show me the number of cases of this disease that you saw by season'

or,

'Show me the number of new cases of this disease that you saw by season'

Also bear in mind that a clear distinction has to be made between frequency of cases and severity of observed cases. Sometimes, researchers or translators can confuse or combine the two questions.

- Similarly, assume you are interested in contact between wildlife and cattle. Is the task to:

'Show me the seasonal changes in wildlife numbers'

or

'Show the seasons when wildlife come into contact with cattle'

or something else?

Representing the disease and disease vector indicators

For literate informants – diseases and disease vectors can be represented by writing the name of the diseases or vectors on pieces of card.

For illiterate informants – use diagrams to represent the diseases and vectors (for example, see Handout 9, Annex 1).

For mixed groups of literate and illiterate informants – use diagrams, so that everyone in the group can easily follow the method.

Scoring the indicators

Taking the first disease or disease vector, ask the informant to show its seasonal occurrence using a pile of 30 stones. Give the informant time to place the stones and check their response. Explain to them that they can change the stones if they wish. When the informant is comfortable with their answer, record the result and move to the next disease or disease vector.

Score each disease and disease vector in turn, gradually building the seasonal calendar row-by-row on the ground.

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Stage 3: Interviewing the calendar

The final stage of the demonstration involves 'interviewing the calendar'. Like the matrix scoring method, a seasonal calendar can act as the basis for further discussion, facilitated by open and probing questions. Examples of such questions are:

Why do you see most cases of the disease called gendi in the wet seasons?

The seasonal changes in the disease called liei follows the same pattern as the biting flies called rom and the snails called chual. Why is this?

You've shown me that the disease called jong acom is seen only in the wet season. When could we use medicines to prevent jong acom?

Practical work

In the Arusha training, the seasonal calendar was practised using the same working groups who practised the matrix scoring method. Each group was asked to produce a seasonal calendar showing seasonal patterns in the same 5 diseases which had been previously investigated using matrix scoring. In addition, the groups were asked to show seasonal variations in disease vectors, or other factors that might be associated with disease occurrence e.g. contact with wildlife. In each group, people playing the livestock keepers were again asked to act as though they were illiterate (as in the matrix scoring practical work).

The groups were given 1 hour to complete the task and prepare a flipchart presentation.

Group presentations

This is an example of a seasonal calendar produced by a working group in the Arusha training, using Somali informants.

It shows four seasons called *gu*, *xagaa*, *deyr* and *jilaal* along the top of the diagram. The left side of the diagram shows 5 camel diseases (represented using simple line drawings) ticks and biting flies. The stars in each 'cell' of the diagram illustrated the seasonal variations. They also decided to look at seasonal variation in 'delivery of vet services'.



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Discussion points arising from the Arusha training

- Using local definitions of season overcomes the problem of some conventional methods, which use researchers' definitions of season that may not be understood by the informants. However, it takes time and patience to understand local names and meanings for seasons – key informants should be used.

Session: Proportional Piling

<p>Session objectives:</p> <p>At the end of the training session, trainees should be able to:</p> <ol style="list-style-type: none"> 1. Describes the uses of proportional piling in PE 2. Demonstrate how to conduct proportional piling with informants 	<p>Outline session plan:</p> <ul style="list-style-type: none"> ○ Presentation to introduce uses of proportional piling ➡ whole group (10 minutes) ○ Demonstration ➡ whole group (~50 minutes) ○ Practical work ➡ in groups (~90 minutes) ○ Group presentations with discussion ➡ whole group (~60 minutes) ○ Summarise key points ➡ presentation (~5 minutes) <p>⌚ Total time required: ~ 2.5 to 3 hours</p>
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A trainer can refer to Handout 15 for background information on the uses of proportional piling in PE. This handout can be used to prepare a very short presentation (no more than 10 minutes) to introduce the method.

Demonstrate the method

Proportional piling can be taught by demonstration followed by practical work in groups. In the Arusha PE training Ethiopian participants acted as highland farmers, and the trainer demonstrated proportional piling by asking them about the same 5 diseases used in the matrix scoring and seasonal calendar sessions. It was assumed that the informants were illiterate.

An important point here is the use of the same diseases in the training sessions on matrix scoring, seasonal calendars and proportional piling. Why bother to do this? This approach helps trainees to understand and practise the concept of triangulation (see Chapter 3). We can use different PE methods to

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investigate the same diseases. Although the methods are intended primarily to explore different aspects of the diseases, there will be some overlap in the information which is generated. This overlap is often most evident during follow-up questioning for each method (e.g. interviewing the matrix), and highlights the importance of interviewing as an essential part of each method.

In the demonstration using the Ethiopian informants, the aim of the proportional piling was to estimate incidence and mortality of five diseases of cattle. The demonstration involved five stages:

- Learn the local classification of cattle by age group and the local names for each age group
- Estimate disease incidences in 'calves'
- Estimate disease mortalities in 'calves'
- Follow-up questioning
- Repeat for other age groups

Stage 1: Identify local terms for different age groups of the livestock type being studied

Ask the informants to explain how cattle are categorized under the traditional system.

The informants named and described three main age groups of cattle as follows:

Calves (0-1 year of age) called *tija*

Heifers (1-3 years of age) called *gider*

Adults (> 3 years of age) called *lam*

Stage 2: Piling of counters to show disease patterns in each age group

Use the same five disease diagram cards that were used during the matrix scoring and seasonal calendar training sessions. Prepare an extra card depicting 'all other diseases'. This gives a total of six disease diagram cards.

Explain that each informant will conduct the exercise in turn, providing information for their own herd (or the herd they look after).

Select one of the informants. Give them a pile of 100 stones and explain that these stones represent all the *tija* (calves) in their herd during the last year. Ask to them to divide the pile to show the pattern of 'calves that remained healthy' and 'calves that became sick'. This will result in two piles of stones representing healthy and sick calves. Record the number of stones in each pile.

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Place the six disease diagram cards in a row and clarify their meaning with the informant. Ask the informant to divide the 'sick' pile of stones to show the pattern of calves becoming sick for each of the five diseases, plus the 'other diseases'. Explain that if no calves were observed with one or more of the diseases, no stones are allocated to that disease(s). Allow enough time for them to do this task and don't interrupt. Record the numbers of stones in each pile.

Stage 3: Piling of counters to show disease mortality patterns in each age group

Ask the informant to focus on the piles of stones representing the 6 different disease categories. Ask them to further divide each pile of stones to show the pattern of calves surviving and calves dying. Record the number of stones allocated to 'calves dying' for each disease category.

Stage 4: Follow-up questioning

The piling of stones described above will result in piles representing healthy calves, plus calves becoming sick and dying for each of the five diseases, plus the 'other diseases' category. The physical presence of the stones/piles can assist follow-up questioning. For example:

What did you do when your calves became sick with the disease called cabeeb?

How did the calves get the disease called cabeeb?

What were these 'other diseases' which caused calves to become sick?

Stage 5: Repeat the method for each age group, and with each informant

The piling and follow-up questioning is repeated for all the other age groups of cattle.

Practical work

Practical work for proportional piling can be arranged in a similar way to matrix scoring and seasonal calendar practical sessions. Note that in the Arusha training, participants did not practise proportional piling in the classroom before going to the field. This proved to be a very useful training lesson – of the four groups working in the field, three groups did not follow the method as demonstrated in class.

At first sight a method such as proportional piling appears to be very simple. However, it is much more difficult to use than people anticipate - always give enough time for classroom practise of PE methods.

Discussion points from the Arusha training

Following the demonstration of proportional piling in the Arusha training, the following discussion points came up.

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Do we use this method with individuals or groups of informants?

The method seems to work with either individuals or groups of informants. If you want to look at individual herds, you need to know who knows most about a particular herd. For example, in a pastoral area the herd may be a long way from the settlement and it is the young men with the cattle who know most about the health problems. These men may not necessarily be the herd owners.

How do we know which animals the informant is referring to? Are these animals only his or her own animals, or do they also include animals that may be loaned to or being cared for by the informant?

Informants can be asked questions that will answer these issues. Movements of animals into and out of herds in pastoral areas can be very complex and include dowry payments and a complex set of loans and gifts. In some cases, it makes sense to define 'herd' as a group of animals cared for by a particular informant over a particular time period.

What happens if an animal suffers from two or more diseases during the period in question?

The method looks at the relative proportion of diseases observed during a given time period, rather than diseases affecting individual animals.

But we have not asked how many animals are in the herd! Do we need to know the number of animals?

A strength of the method is that we don't need to know the number of animals in the herd – this is a sensitive question for any livestock owner and often difficult to verify. The method gives us proportions, not absolute numbers.

Annex 1

Handouts for a training course in participatory epidemiology

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Participatory Epidemiology: A Guide for Trainers

Handout 1

Why is participation important?

The 100-to-1 Cow Project

The farmers in a small village in the Indonesian province of Irian Jaya in western New Guinea, had rarely, if ever, seen a cow before government representatives announced that a boatload of cattle would soon arrive.

The village had about 300 households most of whom depended on subsistence farming supplemented by raising a pig and a few chickens, and by hunting. Apart from government officials and the occasional trader, the village had little contact with the outside world.

Government development planners were anxious to introduce beef cattle to the region in order to provide a new source of meat for the country's rapidly growing urban centres. As the people of the village had migrated to the coast from upland areas known for breeding pigs, the planners assumed that these people would adapt easily to the challenges of expanded livestock-raising.

The visiting officials convened a one-day training programme and then, 100 beef cattle arrived. Almost at once, the animals began wreaking havoc. Knee-high fences designed to keep pigs from entering the village centre were no barrier to the animals; They trampled gardens, damaged homes, broke tools, and fouled fresh water sources. When the cows were shooed away, many wandered into the bush and disappeared.

Deciding to hunt them down before they did any more damage, the villagers armed themselves with bows and arrows and one-by-one they killed the cows until there was only a single animal left alive. Satisfied that the danger was passed, they spared the lone survivor, a living memory to the danger that government officials had called "development".

Source: Connell (1993)-prepared by Stella Maranga, MS-TCDC.

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Handout 2

Participatory approaches: some origins

The participatory approaches in use today have evolved from several sources and traditions. Five of these have been particularly important:

- **Activist participatory research:** Inspired by Paulo Freire (1968), this approach uses dialogue and joint research to enhance people's awareness and confidence and to empower them to take action. Although its special focus on the underprivileged and on political action has limited its spread, its key contributions to the current approaches is its recognition that poor people are creative and capable and should be empowered, while outsiders have a role as catalysts and facilitators.
- **Agroecosystem analysis:** Developed by Gordon Conway and colleagues (for example see Conway 1987). This approach draws on systems and ecological thinking, combining the analysis of systems (productivity, stability, sustainability, equity) with pattern analysis of space, time, flows and relationships, relative values and decisions. Among its major contributions to current approaches are its use of transects, informal mapping and diagramming and the use of scoring and ranking to assess innovations.
- **Applied anthropology:** Although conventional social anthropology has been mainly concerned with understanding rather than changing, applied anthropology became more recognized in the 1980s as a legitimate and useful activity, especially in its ability to help development professionals to appreciate better the richness and validity of rural people's knowledge. It also emphasizes the benefits of unhurried participant observation and conversations and the importance of attitudes, behaviour and rapport.
- **Field research on farming systems:** Two branches of this discipline simultaneously revealed on the one hand the rationality of small and poor farmers on the other hand, their activities as experimenters. Farmers' participation in agricultural research therefore became a focus, especially in the context of complex, diverse and risk-prone farming systems.
- **Rapid rural appraisal:** Emerging in the late 1970s, this was a reaction to general dissatisfaction with the biases inherent in the "rural development tourist" approach, which tended to hide the worst poverty and deprivation. It was also a reaction to the tediousness, expense and frequent inaccuracy of the conventional process of questionnaire surveys. In answering the question "*Whose knowledge counts?*" it sought to enable outsiders to gain insight and information from rural people about rural conditions in a cost-effective and timely manner.

Sources: Andrea Cornwall, Irene Guijt and Alice Welbourn (1993); Robert Chambers (1992)

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Handout 3

Seven types of community participation

Type of participation	Description
1. Manipulative participation (Co-option)	Community participation is simply a pretence, with people's representatives on official boards who are unelected and have no power.
2. Passive participation (Compliance)	Communities participate by being told what has been decided or already happened. Involves unilateral announcements by an administration or project management without listening to people's responses. The information belongs only to external professionals.
3. Participation by consultation	Communities participate by being consulted or by answering questions. External agents define problems and information gathering processes, and so control analysis. Such a consultative process does not concede any share in decision-making, and professionals are under no obligation to take on board people's views.
4. Participation for material incentives	Communities participate by contributing resources such as labour, in return for material incentives (e.g. food, cash). It is very common to see this called participation, yet people have no stake in prolonging practices when the incentives end.
5. Functional participation (Cooperation)	Community participation is seen by external agencies as a means to achieve project goals. People participate by forming groups to meet predetermined project objectives; they may be involved in decision making, but only after major decisions have already been made by external agents.
6. Interactive participation (Co-learning)	People participate in joint analysis, development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals. The process involves interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structured learning processes. As groups take control over local decisions and determine how available resources are used, so they have a stake in maintaining structures or practices.
7. Self -mobilisation (Collective action).	People participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Self-mobilisation can spread if governments and NGOs provide an enabling framework of support. Such self-initiated mobilisation may or may not challenge existing distributions of wealth and power.

(Source: adapted from Pretty 1994)

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Handout 4

Is participation always a good thing?

PARTICIPATION LEADING TO VIOLENCE

Devalia Surendranagar District of Gujarat, India is a highly caste stratified village. Rajputs have traditionally owned the large fields and control most common property resources. Gadvis, with their small land holdings form the lowest of the local caste hierarchy. The Rajputs control most surface water resources in an area characterized by low rainfall and cyclical droughts. The Gadvis, who have no access to irrigation, must rely on one rain fed crop annually, and end up working as labourers for the Rajputs at very low wages.

During a participatory mapping exercise, facilitated by an NGO, the Rajputs explained that improving water resources was a priority for them and indicated the need to dig new wells on their lands. The Gadvis prepared their own village map and showed where they wanted to construct a community well.

A complex process of negotiation and bargaining lasting about three weeks took place between the community groups and the NGO. The Gadvis were the first to organize, and given the equity concerns of the NGO, it was felt appropriate to start with supporting them because they were the most disadvantaged group in the village.

The Gadvis started constructing their community well and struck water within 10 days. They developed a land use plan and map and started preparations for cultivating in the winter season. But the Rajputs became annoyed and angry. They had lost their cheap labourers from the Gadvis community who were no longer dependent on the Rajputs for employment. One afternoon, the group of Gadvis working on their well was ambushed and brutally beaten by a group of Rajputs. Two of the Gadvis died on the spot and others sustained serious injuries.

The NGO facilitators felt horrified about having initiated the participatory process without realizing its implications. It took some time for the NGO and Gadvi leaders to restart a dialogue. However the Gadvi leaders felt that the deaths should not stop the NGO from carrying out similar activities. Today, before supporting programme activities, the NGO spends much more time facilitating negotiations between different community groups.

Source: Shah and Shar (1995)- prepared by Stella Maranga, MS-TCDC

Participatory Epidemiology: A Guide for Trainers*Handout 5***PRA versus other research methods**

	PRA	Survey research	Ethnographic research
<i>Duration</i>	Short	Long	Long
<i>Cost</i>	Low to medium	Medium to high	Medium
<i>Depth</i>	Preliminary	Exhaustive	Exhaustive
<i>Scope</i>	Wide	Limited	Wide
<i>Integration</i>	Multidisciplinary	Weak	Weak
<i>Structure</i>	Flexible, informal	Fixed, formal	Flexible, informal
<i>Direction</i>	Bottom-up	Top-down	Not applicable
<i>Participation</i>	High	Low	Medium to high
<i>Methods</i>	Basket of tools	Standardized	Basket of tools
<i>Major research tool</i>	Semi-structured interview	Formal questionnaire	Participant observation
<i>Sampling</i>	Small sample size based on variation	Random sampling, representative	None
<i>Statistical analysis</i>	Little or none	Major part	Little or none
<i>Individual case</i>	Important, weighed	Not important, not weighed	Important, weighed
<i>Formal questionnaires</i>	Avoided	Major part	Avoided
<i>Organization</i>	Very important	Hierarchical	Not applicable
<i>Qualitative descriptions</i>	Very important	Not as important as 'hard data'	Very important
<i>Measurements</i>	Qualitative or indicators used	Detailed, accurate	Detailed, accurate
<i>Analysis, Learning</i>	In the field and on the spot	At office	In the field and on the spot

Prepared by Stella Maranga, MS-TCDC

Notes on attitudes and behaviour in participatory epidemiology

1. Introduction

An important aspect of participatory approaches¹ is the way we interact with other people. This interaction determines the relationship and trust that develops between researchers and local people, and affects the types of issues and information that people are willing to discuss in an open manner.

If we look at this issue from an epidemiological perspective, the relationship between researchers and livestock keepers is a key factor affecting the reliability and validity of data. If informants are concerned that researchers have a 'hidden agenda', will use the information solely for selfish purposes or may pass information to authorities, then their participation will be poor. Also, if informants consider outsiders to be rude or arrogant, or only interested in their own opinions, the discussion will not be very constructive.

Therefore, a crucial feature of participatory epidemiology is that researchers must be constantly aware of their own attitudes and behaviour.

2. Attitudes

The evolution of participatory epidemiology was strongly influenced by social anthropologists and their interest in indigenous knowledge². In short, researchers began to realise that rural communities had a great wealth of knowledge and skills that had developed over generations. Similarly, farmers were experimenters in their own right. They recognised problems and tested different ways to solve these problems.

Consequently, participatory approaches to development aimed to use indigenous knowledge as the basis for development interventions. By understanding what farmers already knew and involving them in problem-solving, projects were better tailored towards local perceptions and capacities. This principle has been widely applied in some of the better community-based animal health projects in pastoral areas.

From the perspective of meaningful research, researchers must believe that an informant has something useful to say. This means respecting local views and opinions, and being open to ideas that may not necessarily agree with modern science. This does not mean that as veterinarians, we must automatically accept all indigenous knowledge as valid and useful. The idea is to identify local knowledge and skills that seem to agree with our professional know-how, and develop this

¹ Note that this also applies to conventional methods such as interviews used during questionnaire surveys.

² Sometimes called 'ethnoveterinary medicine' when related to animal health and production topics.

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existing local capacity further. At the same time, possible gaps in local knowledge can be identified and discussed.

3. Non-verbal communication and listening skills

As outsiders, everything we do in a community influences information flow. This doesn't only mean what we say, but how we behave. This 'non-verbal communication' can take many forms, for example:

- how we dress and appear
- what we carry with us - our possessions
- how we travel – on foot, bicycle, matatu or project vehicle (bearing the project logo)
- our body posture
- our behaviour

Outsiders always give visual signals about who they are and their reasons for visiting an area. When project vehicles bear logos, people may have false expectations. These expectations need to be discussed. Everyone should clear about the purpose of a piece of work and the likely benefits at the onset.



When using participatory methods, researchers need to think carefully about their behaviour and how this influences the interaction with local people. This interviewer is doing well, but does he really need to take notes during the interview or could it wait until afterwards?



During the workshop, participants will be asked to identify specific examples of non-verbal communication that can have a negative or positive impact on the use of participatory methods.

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Common examples include:

- Dressing formally or in expensive clothes – this can create an impression that the researchers are more wealthy and powerful than informants
- Sitting at a higher level – this makes the researchers automatically look down on the informants
- Failing to make proper personal introductions and begin meetings according to local customs and manners – this can give the impression that local customs are not important
- Failing to arrange meetings and interviews at times which suit local people – people are often busy and are only available at certain times of days
- Showing signs of boredom or fatigue – for example, by yawning
- Showing signs of impatience – for example, foot tapping or repeatedly looking at a wrist watch
- Dominating a discussion or interview by lecturing people
- Refusing to accept offers of local food or drink

4. Do-it-yourself

One way to show people that you're interested in their way of life is to take part in some of the everyday working tasks that they perform. This can show people that you're not too proud to work alongside them and at the beginning of project, helps to create good rapport. In many cases, researchers have to be taught how to perform a certain job. This 'role reversal', with vets learning from local people, shows people that their knowledge and skills are valuable.

If you're in a pastoral area, why not try milking a camel, making some butter or building a local house?

A veterinarian in Ethiopia tries (and fails) to make butter using a traditional method. He did this to show people that although he was university-educated, there were some things that he couldn't do well.



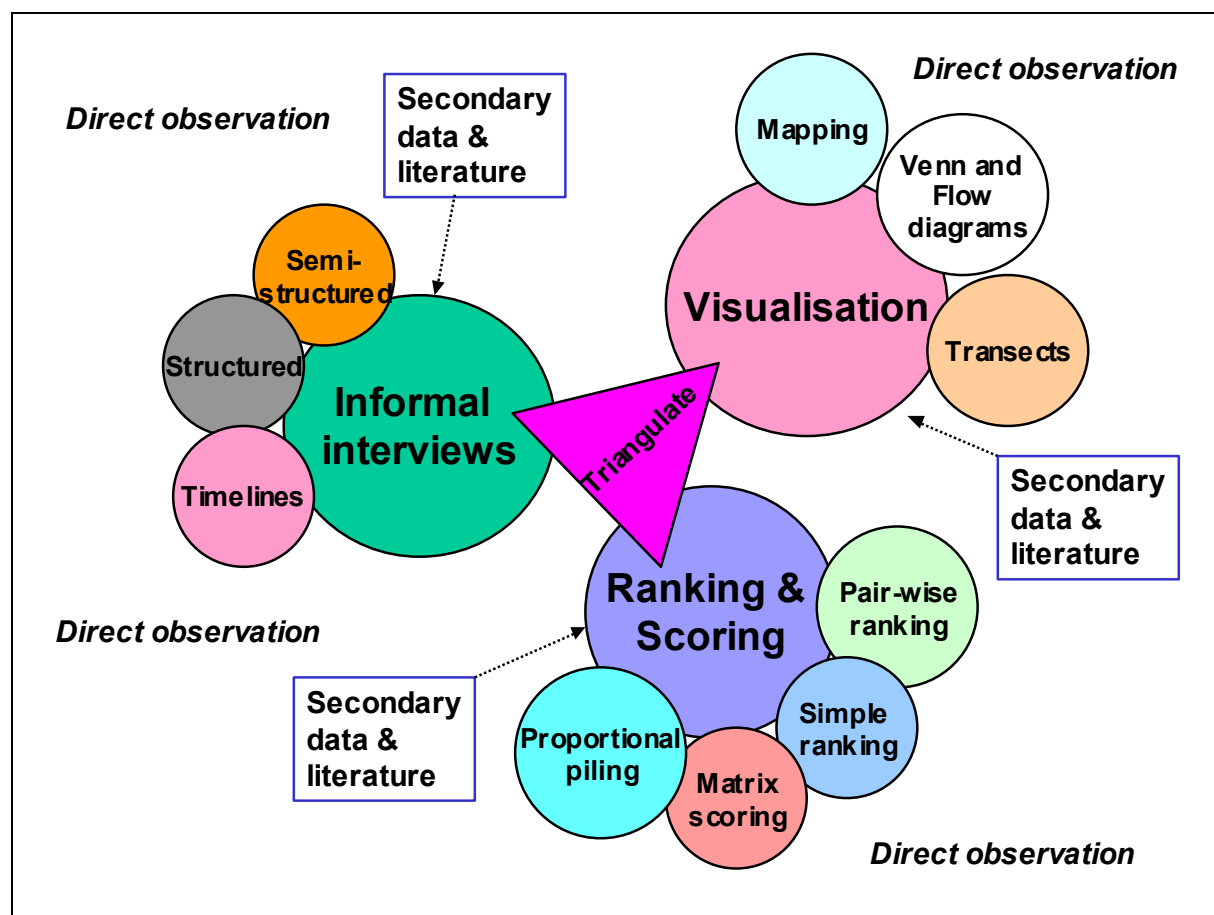
Overview of Participatory Methods

The three main groups of participatory methods are:

- **Informal interviewing methods**
- **Visualization methods**
- **Ranking or scoring**

All these methods are supported by knowledge of **secondary literature** and **direct observation**.

Ideally, the methods are used together. The results from one method are compared with the results of one or more other methods. This process of comparison and cross-checking is called **triangulation**.



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Triangulation can be compared with the process of making a diagnosis in veterinary medicine. When making a diagnosis a clinician collects and compares information from different sources, including the case history, owner interview, direct observation of the farm environment, clinical examination of the animals and so on. All this information is mentally combined to provide a provisional or final diagnosis.

The use of key informants

Within communities, certain local people are recognised as possessing particular knowledge and skills. These local experts or **key informants** can be identified by asking people to identify others who know most about a certain topic and then seeing which names are mentioned repeatedly by different informants. Key informants can be used to provide very detailed information on specialised areas such as specific aspects of crop production, animal husbandry or human health.

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Handout 8

Working as a team when using participatory methods

Many PE methods work best when a team of two or more researchers work together. Within the team, roles should be clearly defined.

- One person should be the **facilitator**. The facilitator introduces the session, asks questions, explains the method and checks the information as it arises from the informants. Therefore, the facilitator interacts directly with the informants and does not need to write anything during the method. In other words, the communication flow is not interrupted because the facilitator keeps stopping the discussion in order to write down what has been said.
- Another team member acts as the **recorder**. This person usually sits slightly back from the group and records the discussion or results of scoring methods as they arise. The recorder also watches the group dynamics and keeps a watch on who talks in the group and who doesn't. If necessary, the recorder can remind the facilitator to include people who are not contributing to the discussion.

The team members need to carefully prepare how they are going to run each session and who is going to say what. It can be very confusing for informants if, for example, the team members interrupt or contradict each other when explaining how a particular method should be conducted.

Managing groups

When working with groups of people, researchers need to pay attention to group dynamics. For example, during a particular method, who is talking and who remains silent? Various methods can be used to encourage less willing participants to contribute their views. Researchers also need to know how to handle dominant talkers in groups i.e. those people who talk to such an extent that other people are excluded from the discussion.

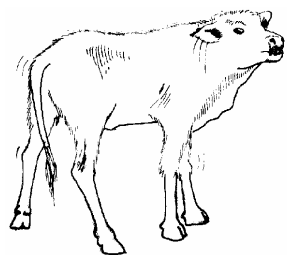
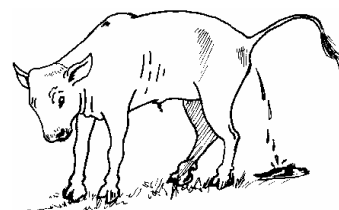
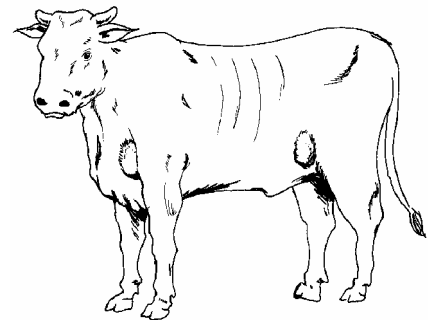
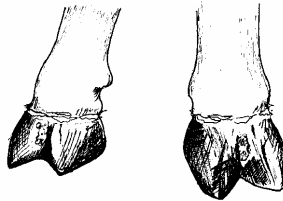
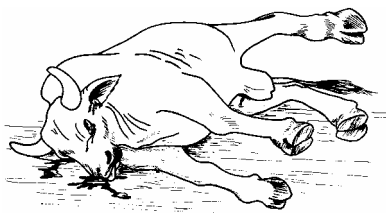
How to manage groups will be discussed during the workshop.

Using pictures and other aids to assist participatory epidemiology methods

An important aspect of PE methods is their capacity to reach illiterate people and involve them in description and analysis of local problems. With methods requiring people to either write or understand text, illiterate people can easily become isolated and may not contribute because they're embarrassed, or because literate people dominant the discussion.

Many PE methods, such as interviews, matrix scoring, mapping, seasonal calendars and proportional piling can be conducted using no written words. With these methods, disease-signs or causes, parasites, livestock types and other items can be represented by either everyday objects or pictures. Pictures can be drawn or printed on to pieces of card and these cards form the 'labels' for the method.

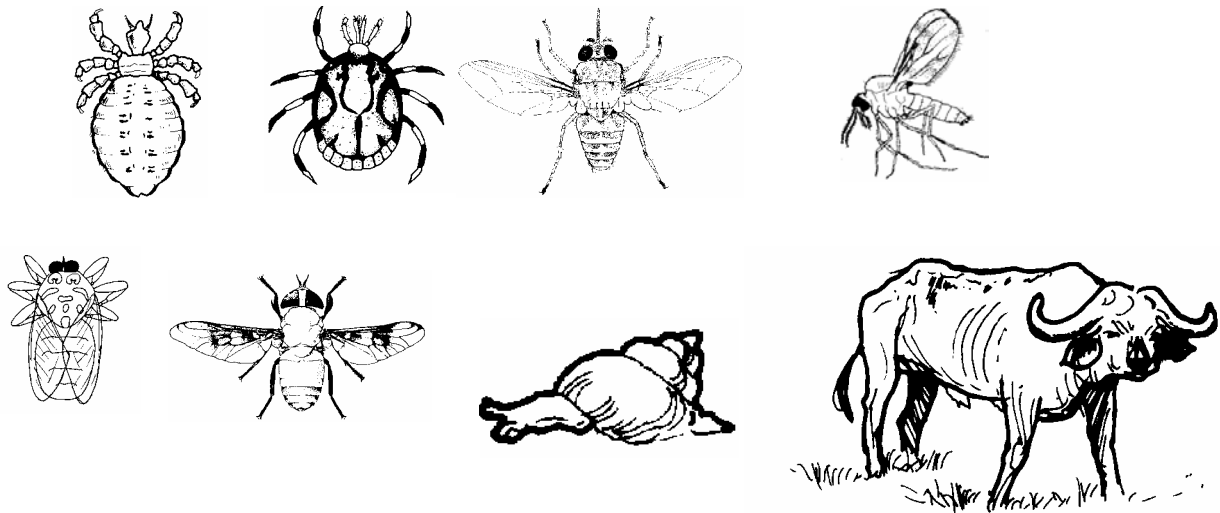
Examples of pictures of clinical signs



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When using pictures, it is always necessary to check that the informants understand the meaning of the pictures. The facilitators need to show each picture to the group and explain its meaning e.g. 'this is a picture of a bull that has died suddenly' or 'this picture shows a cow with wounds on its feet'.

Examples of pictures showing 'causes' or sources of disease



When discussing causes or sources of diseases associated with parasites, actual specimens of parasites can help to ensure that the researchers and informants are talking about the same parasite. It is easy to carry a few preserved specimens to the field and show these to informants. Alternatively, specimens can be collected during post mortem examination. Biting flies can often be captured in the vicinity of livestock.

In all cases, the local names for parasites and disease vectors can be determined using:

- Informal interviews
- Examination of clinical cases, post mortem examination, viewing parasites and naming with livestock keepers
- Matrix scoring of livestock diseases

When all these methods are used, we begin to triangulate (cross-check) the local names for disease and parasites.

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Handout 10

Summary guidelines for semi-structured interviews

1. **Prepare yourself:** this is possibly the most important! Define the topic you want to investigate, work out the key 4 or 5 questions you want to ask and who it is you want to interview. If possible bring an assistant along as a note-taker.
2. **Introduce yourself and the purpose of the meeting:** Your informants will want to know why you have come and why you have an interest in the selected topic.
3. **Watch your body language throughout:** Be friendly, informal, respectful and try to sit on the ground! Stay calm: there is never any need to become emotional!
4. **Start with general questions/comments:** This will put people at ease. The easiest is to start with something visible that everybody can agree with. Use simple language. Ask only one question at a time.
5. **Mix questions with general discussion:** By introducing variety, you will keep up the interest of your informants. Casual dialogue will ensure good communication.
6. **Use diagrams, symbols and other drawings:** These will help in keeping people interested and ensuring everybody participates and understands.
7. **Use simple language:** Avoid “scientific” words. Ask only one question at a time, avoid leading questions, long or complicated questions, or questions which can be answered with simple “yes” or “no”.
8. **Probe:** This is the most difficult. If an interesting point comes up, try and discover more. Six small words (why, how, who, what, when, where?) will help you to probe: keep them in mind throughout!
9. **Observe:** to make sure that everybody participates (especially women) and the conversation is not dominated by a few individuals. Also make sure that people are not getting restless (a sign they are getting tired): normally, 90 minutes is a maximum for group interviews.
10. **When the interview is over:** thank your informants and give them an opportunity to ask their own questions: this is polite and also will give you valuable clues!
11. **Make full notes after the interview:** (unless you have a note taker). By just writing down the main points you will not slow down or interrupt the conversation.

(Source –unknown)

Participatory Mapping

Contents

1. Introduction
2. The method
3. Examples of maps

1. Introduction

Mapping is a type of visualisation method which is a popular participatory tool among animal health workers.

Examples of maps include:

- livestock mobility and grazing maps
- natural resource maps
- opportunities and service maps
- social maps

Mapping is a useful method for the following reasons:

- both literate and non-literate people can contribute to the construction of a map (as it is not necessary to have written text on the map)
- when large maps are constructed on the ground, many people can be involved in the process and contribute ideas. People also correct each other, and make sure that the map is accurate
- maps can represent complex information that would be difficult to describe using text alone
- maps can act as a focus for discussion

In pastoral communities, livestock mobility maps are useful for prompting discussion on topics such as animal health problems that are location-specific, and access to veterinary services when herds are in different places at different times of year.

Also, if you are trying to learn about contact between herds from different communities, maps can show when herds are in close contact with each other or with wildlife. This information is particularly useful when developing strategies for control of epizootic diseases.

Mapping can be useful during the early stages of participatory analysis. The method tends to prompt much discussion and activity among informants, and enables them to define the area under consideration. Although when copied to paper maps become useful outputs of mapping methods, it is important to note that maps can act as the focus for much discussion and follow-up questioning.

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2. The Method

1. Mapping is best used with a group of informants, say between 5-15 people. Find a clean piece of open ground. Explain that you would like the group to produce a picture showing features such as:
 - geographical boundaries of the community. In pastoral areas, these boundaries should include the furthest places where people go to graze their animals
 - main human settlements
 - roads and main footpaths
 - rivers, wells and other water sources
 - grazing areas, farmed areas, forests and other natural resources
 - services e.g. veterinary clinics, duka or Agrovvet shops
 - ethnic groups
 - seasonal movements of livestock by livestock type
 - seasonal and spatial contacts with herds from other communities or wildlife
 - areas of 'high risk' for parasites e.g. tsetse flies or ticks

Explain that the map should be constructed on the ground using any materials that are to hand. For example, lines of sticks can be used to show boundaries.

2. When you are confident that the group understands the task they are being asked to perform, it is often useful to explain that you will leave them alone to construct the map, and return in 30 minutes. At that point, leave the group alone and do not interfere with the construction of the map.
3. After 30 minutes, check on progress. Give the group more time if they wish.
4. When the group is happy that the map is finished, ask them to explain the key features of the map. The process of '*interviewing the map*' enables researchers to learn more about the map and pursue interesting spatial features. Hence, when used imaginatively, mapping methods yield both diagrams and discussion of diagrams. It is important that one member of the team takes notes during this discussion.
5. It is often useful to add some kind of scale to the map. This can be done by taking a main human settlement and asking how many hours it takes to walk to one of the boundaries of the map. A north-south orientation can also be added to the map.
6. Make two large copies of the map on to flip chart paper. Give one copy to the group.

When maps are used to show seasonal variations in livestock movements and locations of tick or tsetse-infested areas, information can be cross-checked using seasonal calendars.

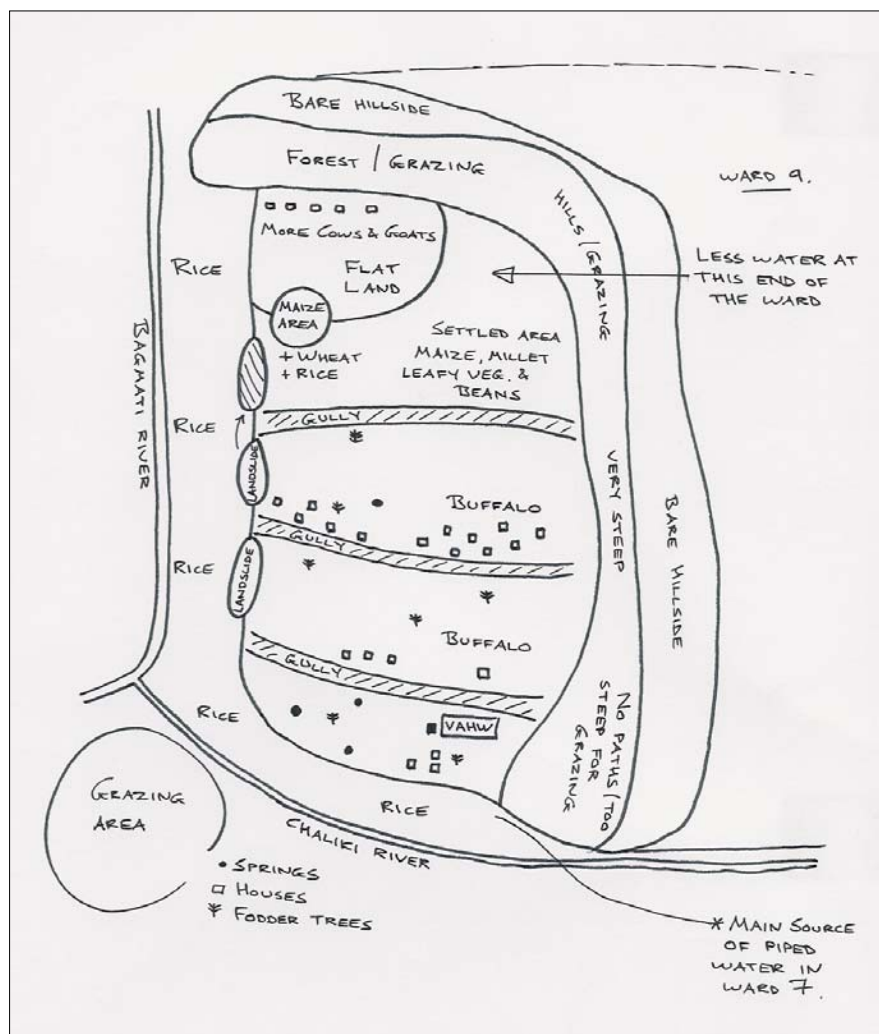
The increasing use of computer scanners means that copies of maps can easily be added to reports.

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Figure 1
 Map of Pyutar Village Development Committee area, Ward 9 by Krishna Bahadur Thing and Iman Singh Ghale

This map was produced by two farmers in a sedentary community in India. The map shows the location of the main livestock types, areas of cultivation and other features.

(source: Young, Dijkema, Stoufer, Ojha, Shrestha and Thapa, 1994, RRA Notes 20)

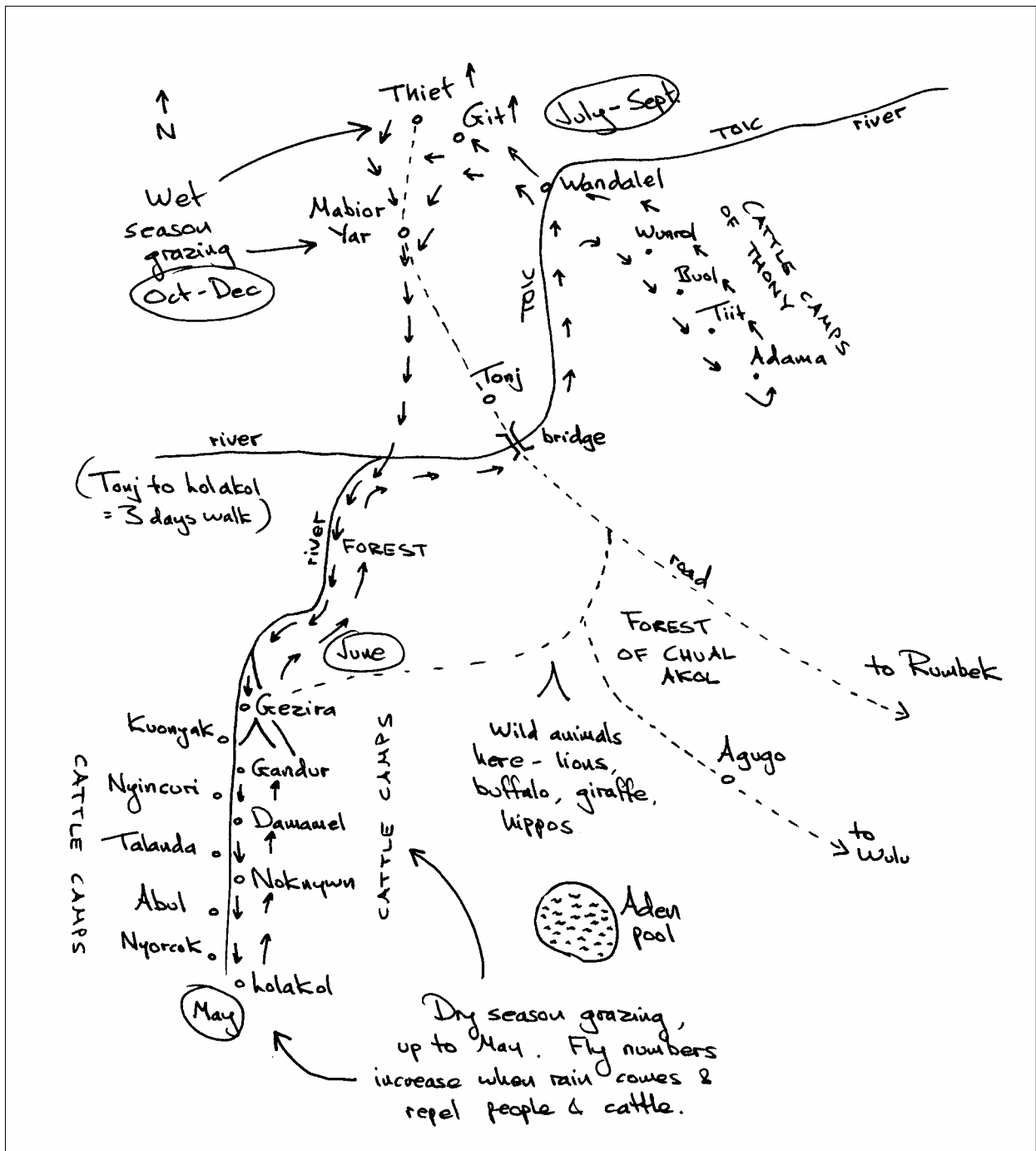


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Figure 2
Map showing cattle movements around Thiet, southern Sudan

This map was produced by a research team investigating trypanosomiasis in cattle. The map shows that people avoided the areas around the Chual Forest and Aden Pool and further questioning revealed that they associated these areas with tsetse. Also, tsetse were present along the river system between Gezira and Lolakol. At the onset of the rains, tsetse numbers increased and people were forced to move northwards.

This map was useful for indicating some local knowledge on tsetse populations and helped the researchers to identify 'best-bet' places to catch tsetse. The map was also used for a discussion on the use trypanocidal drugs in different seasons. (source: IIED/UNICEF/KETRI/IBAR study, southern Sudan 2001)

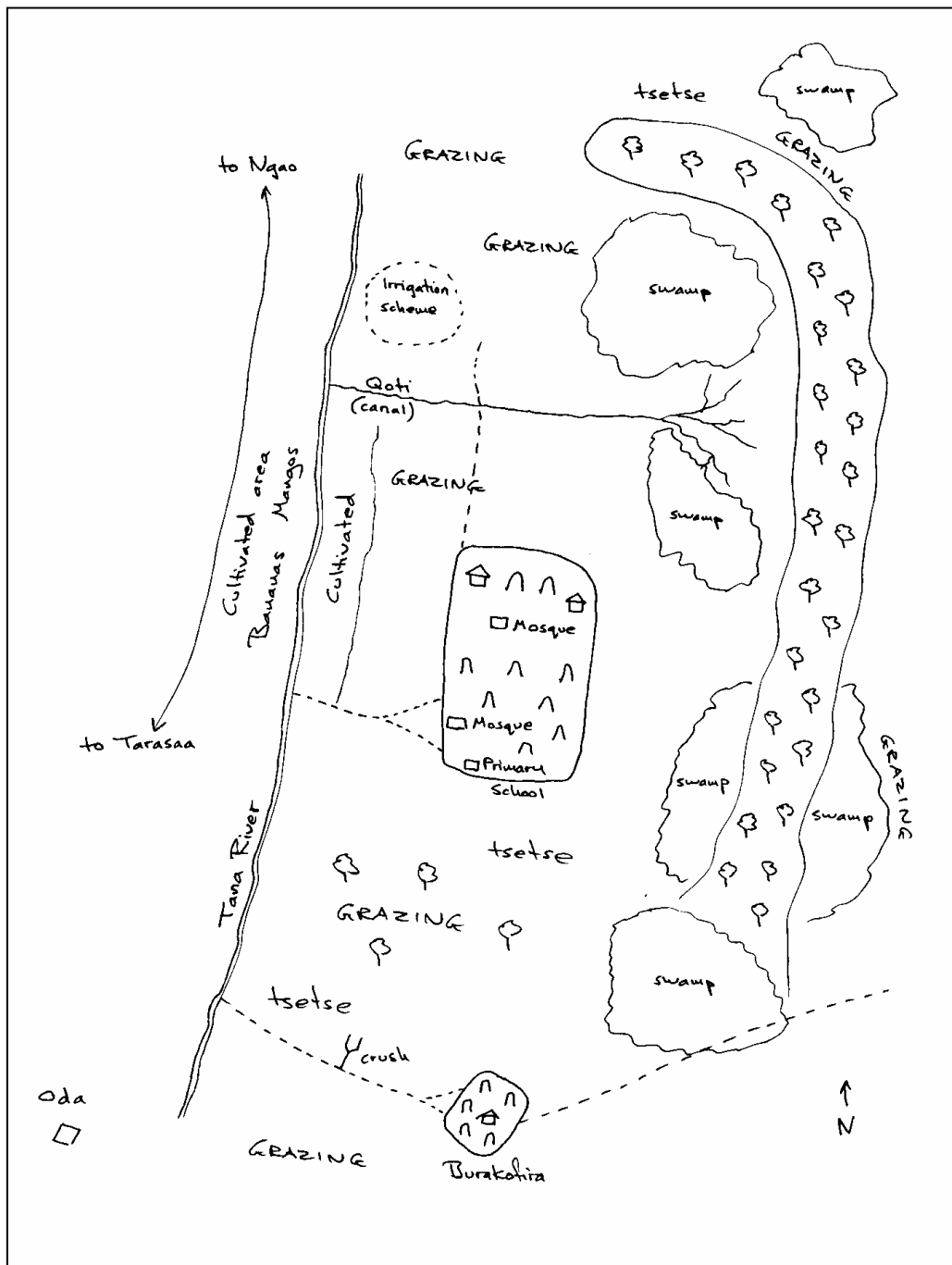


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Figure 3
Map of Kipao village, Garsen Division, Tana River District.

This map was constructed by Orma herders during a study on bovine trypanosomiasis. It shows the dry season grazing areas for cattle around Kipao and proximity to tsetse-infested areas. During the wet season, the area became marshy and cattle were moved to remote grazing areas.

(source: KETRI/IIED/IBAR study, 2001)



Matrix scoring

Contents

1. Uses of matrix scoring in veterinary epidemiology
2. The method
 - Stage 1 - Identification of items to be scored*
 - Stage 2 - Pair-wise comparison of the named items*
 - Stage 3 - Scoring of diseases verses indicators*
 - Stage 4 - Interviewing the matrix*
3. Presenting the results: example of a completed matrix scoring
4. Methodological adaptations and developments
 - Repeating the matrix scoring to improve reliability*
 - Assessing validity*

Further reading

1. Uses of matrix scoring in veterinary epidemiology

This method is used for understanding local characterisation of livestock diseases and meanings of local disease-names.

The method can help to answer the question: *Are the researchers and livestock keepers talking about the same diseases?*

There are two main contexts in which this method is used:

- as part of a general disease survey, in which a number of priority diseases are studied. The method explores local descriptions of these diseases.
- as part of a study on a specific disease, such as trypanosomiasis or CBPP, in which various control diseases are used in the method to help avoid bias. In this situation, *the informants are not told that the researchers are interested in a specific disease* when the method is started.

Participatory Epidemiology: A Guide for Trainers

2. The Method

Stage 1 - Identification of items to be scored

If conducting a general disease survey

Ask the informants to name the items under investigation. For example, if investigating cattle diseases, ask a question such as, "*What are the five most important diseases affecting your cattle throughout the year?*"

If conducting a disease-specific survey

Use informal interviews to get an idea of the local disease name or names which are used to describe the disease or syndrome that you're interested in. Also, use the same interviews to learn some local names for other diseases. These diseases should be considered by the informants to be priority diseases and will be used as 'controls' in the matrix. It is important these 'other' or 'control' diseases are local priorities, because then people are more likely to be willing to sit and discuss these diseases during the matrix scoring.

Whichever type of survey you are conducting, record the diseases named by the informants on to separate pieces of card using the local language. Check that at least one informant is literate. If all informants are illiterate use every-day different objects to represent each named item.

Stage 2 - Pair-wise comparison of the named items

- 2.1 First, choose two of the named diseases (represented as name cards or objects). Show this pair of diseases to the informants and check that they understand the meaning of the name cards or objects.
- 2.2 Ask the question "*Which of these two diseases is most important?*" The informants will discuss among themselves and choose one of the diseases.
- 2.3 Ask the question "*Why is that disease more important than the other?*" The informants will provide a list of reasons why they consider the disease to be important. Record these reasons.
- 2.4 Ask the question "*How do you tell the difference between these two diseases?*" The informants will provide a list of reasons why they consider the disease to be important. Record these reasons.

Note – in participatory methods, the 'reasons' provided by informants are usually called '**indicators**'. When you have asked questions 2.3 and 2.4, you should have a list of indicators like clinical signs (diarrhoea, coughing etc.), extent of the disease with regards morbidity and mortality, production or economic losses, types of species or age groups affected and so on.

- 2.5 Record all the responses and repeat the question until each disease has been compared with every other disease. At the end of the pair-wise comparisons, you should have recorded a long list of indicators.

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Note – if you are planning to use matrix scoring several times during your research, pair-wise comparison is only conducted once, at the beginning of the research. The same diseases and indicators are used for each matrix scoring i.e. a 'standardised' matrix is used.

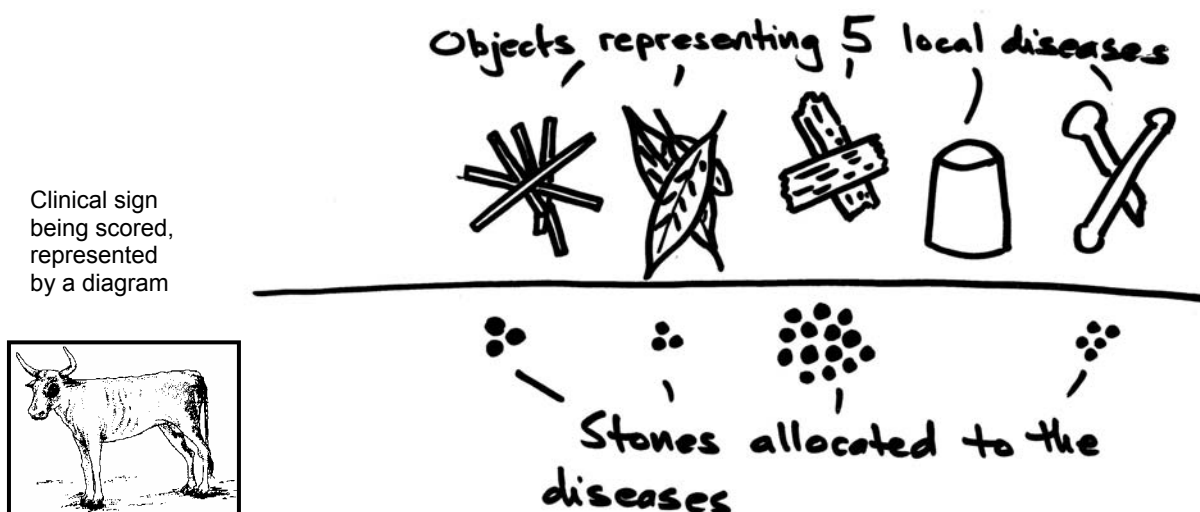
Stage 3 - Scoring of diseases verses indicators

- 3.1 Place the disease name cards or objects in a row on the ground. Once again, check that the informants understand the meaning of name cards or objects. Collect a pile of stones. You will need 5 stones per disease e.g. if 6 items are being scored, 30 stones are required. Remind the informants of the first indicator mentioned during the pair-wise comparison. Write this indicator on to a piece of card or use a **picture** to represent the indicator.

Ask the informants to distribute the stones according to relationship between this indicator and each of the diseases represented by the name cards or objects. Explain that all stones must be used.

- 3.2 After the stones have been allocated to each item, check the scoring with the informants and allow them to alter the scoring if they wish. Record the final number of stones allocated to each disease.

At this stage of the method, you should have the beginnings of a matrix on the ground. The matrix might look like this:



- 3.3 Do not remove the stones. Take a second indicator and place this below the first. Repeat the scoring procedure.
- 3.4 Repeat this procedure, gradually building a line of indicators down the side of the matrix. The matrix should gradually evolve until a complete matrix

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containing all indicators down the y-axis of the matrix is produced and all the indicators have been scored (see Figure 1).

Note – it is useful to pre-prepare all the pictures for the indicators before hand. Draw the pictures on to strong pieces of card that will not become damaged in the field. Also see the handout ‘Using picture to assist PE methods’.

A final matrix scoring will look something like this. At the bottom of the picture the various objects can be seen representing 5 diseases. Along the left side are various picture cards depicting the indicators. Stones have used to show the associations between the diseases and the indicators.



Stage 4 – Interviewing the matrix

The facilitator can use the matrix on the ground to ask questions and develop discussions. By physically pointing to particular scores, the facilitator can summarise all the indicators associated with a particular disease. Open and probing questions can be used to explore the knowledge of the informants.

Note – this is the most difficult stage of the method. Researchers often forget to ask additional questions about the matrix.

Additional notes

As with many PE methods, it is useful to practise and refine the matrix scoring method in the field before using it ‘for real’. Try out the method on a group of animal health workers or livestock keepers to check that they understand the method. Make adjustments to the way you explain the method if it is not clear. This is like pre-testing a questionnaire.

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3. Presenting the results: example of a completed matrix scoring

Copies for informants

First and foremost, it is important to make a copy of the matrix scoring diagram and leave this copy with the informants. This is their record of events and helps to overcome some of the problems of ‘extractive’ research, in which researchers disappear back to towns and never feed back information to local people. After the researchers have left a community, it is common for these diagrams to reappear in teashops, bars and people’s houses, and for more discussion to follow. These copies can be made on A4 paper or flip chart paper.

Presenting the results in reports

There are various ways to present seasonal calendars in reports. A simple line drawing can be glued into a report and photocopied, or a drawing or photograph can be scanned and added to the report. Alternatively, word processing software can be used to produce a version of the diagram (see examples below and overleaf).

Figure 1
Matrix scoring of cattle diseases against disease-signs by 8 Maasai herders near Morogoro, Tanzania

	<i>Endorobo</i> Trypanosomiasis	<i>Oltikana</i> ECF	<i>Olukulu</i> FMD	<i>Emwilalas</i> CBPP	<i>Engluwet</i> Blackquarter
Coughing	••	•••		•••• •••• ••••	
Diarrhoea	•••• •••• ••••				
Salivation		••	•••• •••• ••••	•	
Abortion	•••		•••• •••• ••••		
Enlarged lymph nodes	•••	•••• •••• ••••			
Lameness			•••• •••• ••••		••
Disease causes death		••• •••		•	••
Reduced milk yield		••	•••• •••• ••••		

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4. Methodological variations

Repeating the matrix scoring to improve reliability

The matrix scoring method produces numerical scores. The scoring part of the method can be standardised and repeated with different informants (groups or individuals).

Standardisation means that the diseases and indicators used in the matrix scoring are kept constant. Similarly, the number of stones or seeds used as counters is also kept constant.

The method should be repeated with at least 10 informant groups (group size 5 –10 people)

Scores can be summarised using median scores, minimum and maximum scores and 95% confidence intervals. The Kendal coefficient of concordance (W) can be used to assess agreement between informant groups and give a measure of reliability.

An example of a standardised and repeated matrix scoring method is provided in Figure 2 overleaf.

Assessing validity

Results from matrix scoring can be compared with standard textbook descriptions of diseases, and judgements made by veterinarians concerning the relationship between local disease descriptions and 'scientific' disease descriptions.

Using control diseases in the matrix

As mentioned previously, matrix scoring can be used to investigate specific diseases (e.g. trypanosomiasis). In these cases, it is useful to introduce at least one or two 'control' diseases into the matrix.






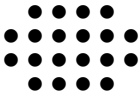




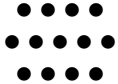


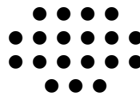


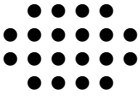





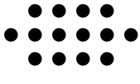


Figure 2 overleaf shows an example of this. This matrix scoring was used to study local perceptions of a chronic wasting disease in adult cattle. Interviews indicated that herders identified three diseases which caused cows to become thin, called *liej*, *maguar* and *maceuny*. In order to find out how herders distinguished between these three diseases, a matrix scoring was developed using these three disease plus two control diseases.

The control diseases used were *dat* (FMD) and *dop* (CBPP) because these diseases had already been characterised by veterinarians working in southern Sudan.

The use of control helps to show whether the informants understand the matrix scoring method, because the researchers can check whether expected results for the controls are produced. For example, in Figure 2 the control disease *dop* (CBPP) should be strongly associated with coughing.

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Figure 2
Example of matrix scoring of disease signs for diseases of adult cattle in Nyal, southern Sudan

Signs	Diseases				
	<i>Liei</i>	<i>Dat</i> (FMD)	<i>Maguar</i>	<i>Doop</i> (CBPP)	<i>Macueny</i>
Chronic weight loss (W=0.51 ^{***})	 10 (6.0-16)	 1 (0-2.5)	 3 (0-3.0)	 1 (0-2.5)	 1 (0-2.0)
Animal seeks shade (W=0.88 ^{***})	0 (0)	 20 (17-20)	0 (0)	0 (0-3.0)	0 (0)
Diarrhoea (W=0.52 ^{***})	 4 (0-8.5)	0 (0)	 11 (6.0-16)	0(0)	 4 (0-7.5)
Reduced milk yield (W=0.51 ^{***})	 2 (0-4.0)	 13 (7.0-20)	 3 (0-9.0)	 1 (0-2.5)	0 (0-1.0)
Coughing (W=0.76 ^{***})	0 (0-0.5)	0 (0-0.5)	0 (0-2.0)	 19 (16.5-20)	0 (0-0.5)
Reduced appetite (W=0.54 ^{***})	0 (0)	 13 (7.0-20)	0 (0)	 5 (0-10)	0 (0)
Loss of tail hair (W=0.89 ^{***})	 20 (16.5-20)	0 (0)	0 (0-3.5)	0 (0)	0 (0)
Tearing (W=0.28 [†])	 6 (3.0-13)	 2 (0-6.5)	 4 (0-8.5)	0 (0-1.5)	 3 (0-8.0)
Salivation (W=0.50 ^{***})	 2 (0-3.0)	 14 (7.0-20)	 3 (0-6.5)	 1 (0-2.0)	0 (0-0.5)

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Notes for Figure 2

Number of informant groups = 12; W = Kendal coefficient of concordance (*p<0.05; **p<0.01; ***p<0.001). The black dots represent the scores (number of seeds) that were used during the matrix scoring. Median presented (95% confidence limits). A high number of dots indicates a relatively strong association between a sign and a disease whereas a low number of dots indicates a weak association.

Further reading

Detailed methodologies and applications of matrix scoring can be found in these papers:

Admassu, B., Nega, S., Haile, T., Abera, B., Hussein, A. and Catley, A. (2005). Impact assessment of a community-based animal health project in Dollo Ado and Dollo Bay districts, southern Ethiopia. *Tropical Animal Health and Production*. In press.

Catley, A., Irungu, P., Simiyu, K., Dadye, J. Mwakio, W., Kiragu J. and Nyamwaro, S.O. (2002). Participatory investigations of bovine trypanosomiasis in Tana River District, Kenya. *Medical and Veterinary Entomology*, 16, 1-12.

Catley, A., Okoth, S., Osman, J., Fison, T., Njiru, Z., Mwangi, J., Jones, B.A. and Leyland, T.J. (2001). Participatory diagnosis of a chronic wasting disease in cattle in southern Sudan. *Preventive Veterinary Medicine*, 51/3-4, 161-181.

Catley, A., Chibunda, R.T., Ranga, E., Makungu, S., Magayane, F.T., Magoma, G., Madege, M.J. and Vosloo, W. (2004). Participatory diagnosis of a heat-intolerance syndrome in cattle in Tanzania and association with foot-and-mouth disease. *Preventive Veterinary Medicine*. 65/1-2, 17-30.

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Handout 13

Example of a summarized disease matrix

	<i>Endorobo</i> Trypanosomiasis	<i>Oltikana</i> ECF	<i>Olukulu</i> FMD	<i>Emwilalas</i> CBPP	<i>Engluwet</i> Blackquarter		
Acute disease signs	Coughing (W=0.793)	2.5 (0-4)	5.0 (0-15)	0 (0-1)	14.0 (3-16)	0 (0-1)	
	Diarrhoea (W=0.774)	20.0 (3-20)	0 (0-17)	0 (0-0)	0 (0-0)	0 (0-0)	
	Salivation (W=0.780)	0 (0-2)	4.0 (0-6)	14.0 (6-20)	1.0 (0-8)	0 (0-0)	
	Abortion (W=0.900)	6.0 (3-8)	0 (0-4)	10.0 (5-14)	0 (0-4)	0 (0-0)	
	Enlarged lymph nodes (W=1.000)	6.0 (3-8)	14.0 (12-17)	0 (0-0)	0 (0-0)	0 (0-0)	
	Lameness (W=0.865)	0 (0-0)	0 (0-0)	17.5 (10-20)	0 (0-0)	2.5 (0-10)	
	Disease causes death (W=0.533)	0 (0-4)	7.0 (0-20)	0 (0-3)	1.0 (0-5)	3.5 (0-20)	
	Reduced milk yield (W=0.602)	0 (0-10)	0 (0-4)	14.0 (7-20)	0 (0-0)	0 (0-0)	
	Chronic disease signs	Cow seeks shade (W=0.949)	0 (0-6)	0 (0-0)	20 (14-20)	0 (0-0)	0 (0-0)
		Weight loss (W=0.324)	7.5 (0-20)	0 (0-5)	2.0 (0-15)	5.0 (0-20)	0 (0-0)
Hair overgrowth (W=1.000)		0 (0-0)	0 (0-0)	20 (20-20)	0 (0-0)	0 (0-0)	
Panting (W=0.836)		0 (0-0)	0 (0-4)	20 (10-20)	0 (0-0)	0 (0-0)	
Reduced fertility (W=0.627)		0 (0-9)	0 (0-0)	15.5 (0-20)	0 (0-0)	0 (0-0)	
Overgrowth of hooves (W=1.000)		0 (0-0)	0 (0-0)	20 (20-20)	0 (0-0)	0 (0-0)	
Loss of tail hair (W=1.000)		20 (20-20)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	
Wallows in water (W=0.949)		0 (0-5)	0 (0-0)	20 (15-20)	0 (0-0)	0 (0-0)	

Seasonal calendars

Contents

1. Uses of seasonal calendars in veterinary epidemiology
2. The method
 - Stage 1 – Construct a one-year time line*
 - Stage 2 – Showing rainfall patterns*
 - Stage 3 – Showing seasonal patterns of diseases and vectors*
 - Stage 4 – Interviewing the diagram*
3. Presenting the results: example of a completed seasonal calendar
 - Copies for informants*
 - Presenting the results in reports*
4. Methodological adaptations and developments
 - Repeating the seasonal calendar method to improve reliability and validity*
 - Assessing the validity of data from seasonal calendars*

Further reading

1. Uses of seasonal calendars in veterinary epidemiology

Temporal variations in disease occurrence are a common aspect of epidemiological investigation. Seasonal calendars are a useful method for understanding local perceptions of seasonal variations in disease incidence or populations of ticks, biting flies or other factors.

When informants have well-developed indigenous knowledge, seasonal calendars can help to overcome some of the difficulties of conducting expensive and logistically demanding longitudinal studies. Seasonal calendars can also generate new hypotheses about associations between diseases, environmental factors, and interactions with wildlife and vectors.

2. The Method

- In order to use seasonal calendars the researchers should understand and use local names for seasons or months.
- This requires some preliminary interviews with key informants to learn local names and relate these names to the Gregorian calendar

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- Using months creates a more detailed seasonal calendar but is more time consuming. Often, translation of months into a working language is complicated and it is easier to use seasons.
- This method can be used with a single informant or a group of informants. If a group has more than 10 people, it is difficult to get everyone to contribute to the method.

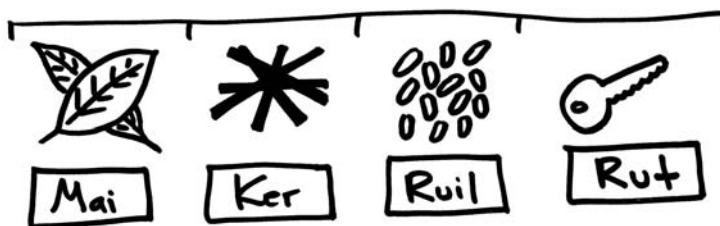
Stage 1 – Construct a one-year time line

Explain to the informants that you are interested in learning about how diseases change throughout the year.

Draw a horizontal line on the ground to represent 1 year. The line should be at least 1 metre in length. Divide the line according to local definitions of month or season.

Label each month or season using either a piece of card with the local name or an every-day object to represent each month or season. Carefully explain the meaning of the cards or objects to the informants and ask them questions to check that they understand these meanings.

In the diagram here, four seasons called *Mai*, *Ker*, *Ruil* and *Rut* have been represented using different objects (so that illiterate informants can still understand the diagram) and also, labels with written words are used.



Stage 2 – Showing rainfall patterns

It is useful (though not essential) to choose rainfall as the first event to be illustrated on the calendar. Why? This is because in the tropics where temperature variations are relatively mild, rainfall is often the main determinant of livestock movements, animal interactions and populations of disease vectors such as biting flies, snails and so on.

Give the informants a pile of stones, say 30 stones, and ask them to divide the stones against the seasons (or months) to show the pattern of rainfall throughout a typical year. The greater the rainfall in a particular season, the greater the number of stones assigned to that season. Similarly, a season with no rain should have no stones assigned to it. All the stones should be used.

When the informants have placed all the stones against the seasons, check the scoring by asking questions such as 'You've placed most of the stones against season x, so season x receives most rainfall?' Give the informants the chance to change their scores if they wish.

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Record the final scores and leave the stones in place.

Stage 3 – showing seasonal patterns of diseases and vectors

Ask the informants to illustrate on the diagram the occurrence of the events under investigation. Events might be the livestock diseases previously identified during a livestock-disease scoring or ranking.

Each disease or vector should be represented by written labels, **pictures** or **actual specimens**. It is often useful to pre-prepare the pictures on pieces of card – see the handout ‘**Using pictures to assist PE methods.**’ Remember that written labels are only understood by literate informants. Illiterate informants, although very knowledgeable on animal health matters, can become isolated from the method if written labels are used.

Take each disease or vector in turn, and ask the informants to show the seasonal variation using piles of stones. Keep the numbers of stones constant for each item scored.

How do I know the meaning of the local names for disease or vectors?

In all cases, the local names for diseases and disease vectors or parasites should be pre-determined using:

- Informal interviews
- Examination of clinical cases, post mortem examination, viewing parasites and naming with livestock keepers
- Matrix scoring of livestock diseases

When all these methods are used, we begin to triangulate (cross-check) the local names for disease and parasites – see the handout on triangulation.

Therefore, the seasonal calendar methods should be used at a late stage in the study, after other methods have determined the meanings of local terminology.

When discussing disease vectors such as flies, ticks and so on, it is very useful to carry preserved specimens in clear glass bottles, or, ask people to collect specimens during the study. This often creates much interest and enthusiasm amongst livestock keepers.



Key point

It is important to be clear in your own mind what you are going to ask the informants to do. If you are interested in seasonal variations in disease incidence, the advice to the

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informants should be something like, 'Divide the stones to show me when cases of disease x are seen'.

After each disease or vector has been scored against the seasons, check the scoring with the informants. Give them an opportunity to change the scoring if they wish and record the final scores that they are comfortable with.

The seasonal calendar will slowly grow as more diseases or vectors are added to it.



Seasonal calendars can 'grow' into large diagrams on the ground.

In this example, the diseases and vectors are represented using every-day objects as seen down the left side of the diagram. The 4 seasons are also represented using objects (difficult to see, furthest from camera). Various piles of stones can be seen representing the seasonal patterns of each variable.

Stage 4 – Interviewing the diagram

Ask the informants to explain interesting aspects of the diagram i.e. the positioning and relative scores of the various diseases and parasites. Use probing questions (e.g. *Why? How?*) to follow-up interesting leads.

Examples of questions

'Why do you mainly see the disease liei in the wet season?'

'You've shown me that the disease called dop is seen mainly in the wet season – when is the best time to prevent this disease?'

'Why do you see the disease called kud in the dry season?'

This stage of the method is crucial. It helps to cross-check the information presented in the diagram and enables the researchers to explore the reasoning behind the scores. It also ensures local analysis of the information.

The researchers should take detailed notes of the questions and discussion – these notes are part of the 'results' of the seasonal calendar and should be presented in any reports arising from the use of the method.

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Additional notes

In addition to the method for a seasonal calendar described here, there are other ways to construct this type of diagram. Some people simply draw the whole diagram on the ground and then copy the diagram on to paper.

Whichever method is used, it is important to ***practise the method*** before using it 'for real' in the field. Try out the method on some animal health workers or livestock keepers to make sure that the method is understood and the questions you ask are clear. This is like pre-testing a questionnaire.

3. Presenting the results: example of a completed seasonal calendar

Copies for informants

First and foremost, it is important to make a copy of the diagram and leave this copy with the informants. This is their record of events and helps to overcome some of the problems of 'extractive' research, in which researchers disappear back to towns and never feed back information to local people. After the researchers have left a community, it is common for these diagrams to reappear in teashops, bars and people's houses, and for more discussion to follow. These copies can be made on A4 paper or flip chart paper.

Presenting the results in reports

There are various ways to present seasonal calendars in reports. A simple line drawing can be glued into a report and photocopied, or the drawing can be scanned and added to the report. Alternatively, word processing software can be used to produce a version of the diagram (see examples overleaf).

Whichever method is used, it is important to include not only the diagram itself but also the notes on the questions and discussion which took place both during the construction of the diagram and when 'interviewing the diagram'.

Example

The seasonal calendar overleaf was constructed by a group of 5 Orma pastoralists in Tana River District, Kenya. The five Orma seasons are written along the top of the diagram and the various diseases and vectors are placed down the left side of the diagram.

The black dots represent the stones that were used by the informants to show the seasonal patterns. This example is interesting because it includes seasonal interactions between cattle and buffalo.

Notes on the discussion are included to help explain key aspects of the diagram.

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Figure 1
 Seasonal calendar for livestock diseases, biting flies, ticks and cattle-wildlife contact in Danissa, Tana River District, Kenya (5 Orma informants)

		Orma seasons				
		<i>Hageiya</i>	<i>Bona hageiya</i>	<i>Gana</i>	<i>Shuricha</i>	<i>Bona adolesia</i>
Diseases	Rainfall <i>Roba</i>	•• ••		••• ••• ••	•• •	••
	Trypanosomosis <i>Gandi</i>	••• ••• •••	••• ••• •••	••	••	•
	FMD <i>Hoyale</i>	•• •	••• ••• •••	•• •	•• •	•• •
	Haemorrhagic form <i>T.vivax</i> <i>Buku</i>	•••• ••••	•••• ••••			
	CBPP <i>Somba</i>					•••• •••• •••• ••••
Rinderpest <i>Madobesa</i>						
flies, ticks and wildlife	Tsetse <i>Gandi</i> <i>'kawaida'</i>	•• ••	•• ••	•• ••	•• ••	•• ••
	?Tsetse <i>Gandi bulu</i>		•••• •••• •••• ••••			
	Tabanids <i>Kobabe</i>	•••• •••• •••• ••••				
	Ticks <i>Shilmi</i>	•• •	••• ••• •••	••	••	•• •
	Buffalo <i>Gadarsi</i>	•• ••	•••• •••• ••••			

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Notes on discussion

- More cattle are present in the delta and permanent villages during *hageiya* and *bona hageiya*. As the delta is wet (during *hageiya*) and hot (during both *hageiya* and *bona hageiya*) during these seasons, exposure to biting flies and ticks is high.
- As the main rains (*gana*) begin, cattle move out of the delta to avoid flooded areas, and into the hinterland. As the hinterland is drier than the delta and has different vegetation, exposure to biting flies and ticks reduces.
- This pattern of seasonal movement into and out of tsetse and tick-infested areas in the delta determines the level of contact between cattle and these vectors. Although the *hawicha* milking herds can be permanently in the delta, these herds are relatively small in size.
- Contact between cattle and buffalo peaks during the dry periods *bona hageiya* and *bona adolesia* because animals congregate around dry season water points.

4. Methodological adaptations and developments

Repeating the seasonal calendar method to improve reliability and validity

In most animal health studies, seasonal calendars are used with only a small number of informants or informant groups. However, like the matrix scoring method, seasonal calendars generate numerical scores very early in the method.

Repetition of a standard method allows results to be summarised using medians and measures of spread such as 95% confidence intervals. Agreement between individual informants or informant groups can be determined using nonparametric tests such as the Kendal coefficient of concordance (W).

How to standardise?

A standardised method can be developed in the field.

1. First, try out a seasonal calendar on a trial basis and include the disease and vectors that you as a researcher are interested in, and/or which livestock keepers have identified as important.
2. Limit the number of diseases or vector to no more than 15. Otherwise, the method becomes too time-consuming and cumbersome.
3. Always include some diseases or vectors which may not be of much interest to you or the informants. These diseases and vectors act as a type of control in the method.
4. Always keep the seasons, diseases and vectors, and number of stones constant.
5. Repeat the method with at least 10 informant groups.
6. Follow-up questions can vary for each group and do not need to be standardised. This allows for some flexibility in the method and provides space for researchers to follow interesting leads and ideas as they emerge.

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Example

A standardised seasonal calendar was developed in southern Sudan during a study on a chronic wasting disease called *liei*. The method was repeated with 10 informant groups

See Figure 2 overleaf.

Notes for Figure 2

Number of informant groups = 10; W = Kendal coefficient of concordance (* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$). The black dots represent the number of seeds that were used during the construction of the seasonal calendars. Medians are presented (95% confidence limits). A high number of dots indicated a relatively strong association between a disease or parasite and season, whereas a low number of dots indicated a weak association.

Assessing the validity of data from seasonal calendars

Data derived from seasonal calendars can be assessed in various ways.

Rainfall patterns can be compared with official measures of rainfall as gathered by meteorological stations. This official data should be compiled on a seasonal basis to allow direct comparison with the seasonal calendar data. Programmes such as USAID's Famine Early Warning System (FEWS) also collect rainfall data and make this data available to the public.

Disease and vector patterns can be compared with standard, textbook descriptions of seasonal patterns. For example, FMD outbreaks can occur during the dry season when cattle and wildlife interact around water holes; fascioliasis is associated with the wet season; mosquito and some tick populations increase in the wet season, and so on. Ultimately, longitudinal studies can be used to define seasonal patterns of diseases or vectors, although such studies can be difficult to implement in some areas and production systems e.g. mobile pastoral systems.

Further reading

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Figure 2
Summarised seasonal calendar for livestock diseases, biting flies, ticks and snails in Thiet, Tonj County (a Dinka area in southern Sudan, 2000)

	Seasons			
	Mai (Feb-Apr)	Ker (May-Jul)	Ruil (Aug-Oct)	Rut (Nov-Jan)
Rainfall (proportion of total annual rainfall) (W=0.96 ^{***})	0 (0)	7 (5.0-9.0)	11 (10.0-13.5)	1 (0-2.5)
Liei Mixed parasitism (W=0.32 [*])	4 (1.0-7.0)	1 (1.0-2.0)	7 (3.0-11.5)	7 (3.5-10.5)
Abuot pou CBPP (W=0.41 ^{**})	3 (1.5-4.5)	4 (2.5-5.0)	8 (6.5-10.0)	5 (3.0-7.0)
Jul Chronic foot-and-mouth disease (W=0.38 [*])	3 (0-10.0)	3 (0-5.5)	11 (5.5-15.5)	3 (0-5.5)
Jong acom Fasciolosis (W=0.50 ^{**})	0 (0-0.5)	7 (0-11.5)	9 (4.5-11.0)	4 (0-6.5)
Cual Brucellosis (W=0.21)	3 (0-5.0)	5 (2.0-9.0)	6 (2.5-9.0)	6 (2.5-9.5)
Rum Tabanid sp. (W=0.42 [*])	1 (0-2.5)	9 (5.0-11.0)	4 (2.0-8.0)	6 (2.0-9.5)
Luang Stomoxys sp. (W=0.38 [*])	5 (3.0-7.0)	7 (4.0-9.0)	7 (4.5-9.0)	2 (0-3.5)
Dhier Mosquitoes (W=0.85 ^{****})	0 (0-0.5)	5 (2.0-6.5)	12 (11.0-15.0)	4 (1.0-5.5)
Chom Snails ^{****} (W=0.83 ^{***})	0 (0)	9 (5.0-12.0)	9 (7.0-14.5)	0 (0-2.0)
Mau Tsetse flies (W=0.08)	4 (1.5-7.5)	7 (3.5-12.5)	3 (0-5.5)	5 (2.5-9.0)
Achak Ticks (W=0.79 ^{****})	0 (0-2.5)	11 (6.0-14.0)	6 (3.5-9.0)	1 (0-2.5)

Proportional piling

Contents

1. Uses of proportional piling in veterinary epidemiology
2. The method
Example 1 Assessing incidence of cattle diseases in Tana River District, Kenya
Example 2 Assessing cattle disease incidence and mortality in Maasai herds, Morogoro, Tanzania
3. Assessing validity
4. Recent uses – disease modelling

1. Uses of proportional piling in veterinary epidemiology

Proportional piling methods have various epidemiological uses, but are particularly useful for determining herd age structures, and disease incidence and mortality.

Two important advantages of proportional piling are:

- the method does not require herd sizes to be estimated. Therefore, sensitive questions like ‘how many cattle do you own’ are not necessary
- when assessing disease incidence and mortality, the method involves comparison of different diseases and therefore, avoids exaggeration of a particular disease situation

2. The method

Example 1 Assessing incidence of cattle diseases in Tana River District, Kenya

Proportional piling was used to determine the incidence of cattle diseases in Orma pastoral communities, Kenya. Previous use of matrix scoring had indicated that Orma disease names could be interpreted as follows:

<i>gandi</i>	chronic trypanosomiasis
<i>hoyale</i>	FMD
<i>buku</i>	acute trypanosomiasis
<i>somba</i>	CBPP
<i>madobesa</i>	rinderpest

Orma pastoralists categorised their cattle by age as follows:

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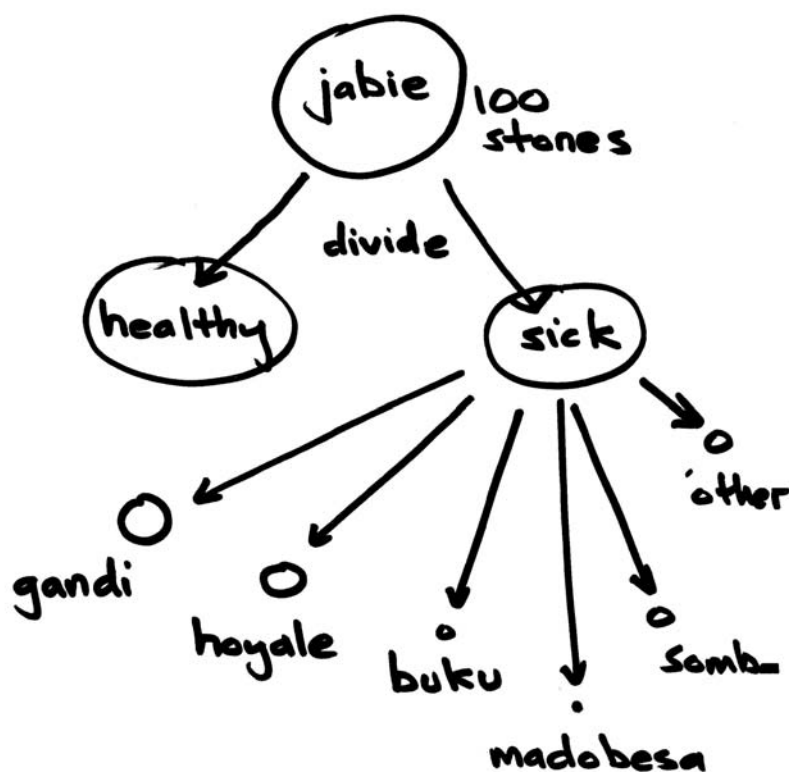
<i>Jabie</i>	Calves up to around weaning age; the 0-2 years age group.
<i>Waela</i>	Weaner group, 2-3 years old.
<i>Goromsa</i>	Young adult stock, including heifers and young bulls; age group 3 to 4 years.
<i>Hawicha</i>	Adult stock, particularly the milking cows kept around the permanent villages; > 4 years of age.

The proportional piling method was repeated with each of the 4 age-groups of cattle and involved the following stages:

1. Taking the *jabie* age group first, a pile of 100 stones was used to depict this age group. An informant was asked to divide this pile of stones into two piles to show the pattern of 'sick *jabie* cattle during the last year' and 'healthy *jabie* cattle during the last year' in his herd.
2. The pile of stones representing sick cattle was then sub-divided by the informant to show the pattern of *jabie* cattle suffering from *gandi*, *hoyale*, *buku*, *somba*, *madobesa* and 'other diseases' during the last year.
3. When this piling was completed, the stones were gathered and the procedure was repeated with the other age groups.

This method was repeated with 50 informants (i.e. information was obtained from 50 herds).

Diagrammatic representation of the proportional piling method for the *jabie* age group. The method is repeated for each age group.



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Presenting the information

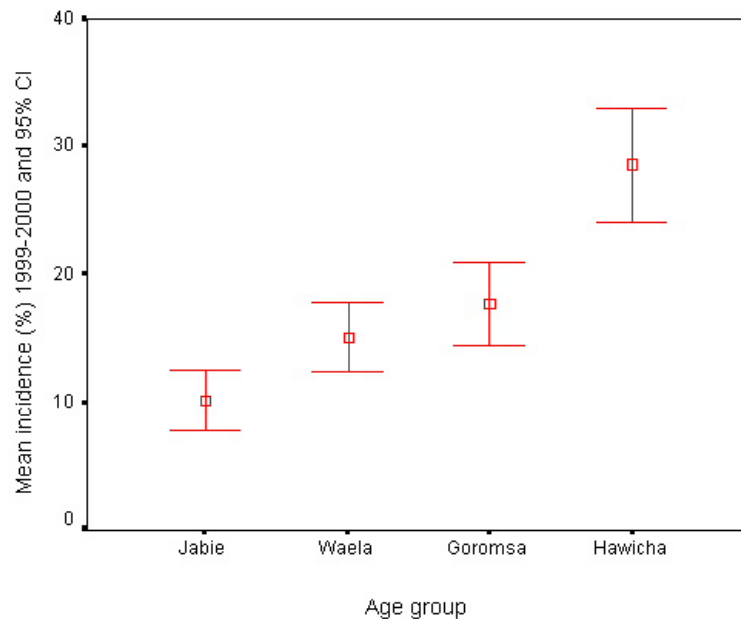
Mean incidence and 95% confidence limits were calculated for each disease by age group. Correlation between age and disease incidence was assessed using Pearson's correlation coefficient.

Results can be presented as disease incidence by age group – an example is shown below.

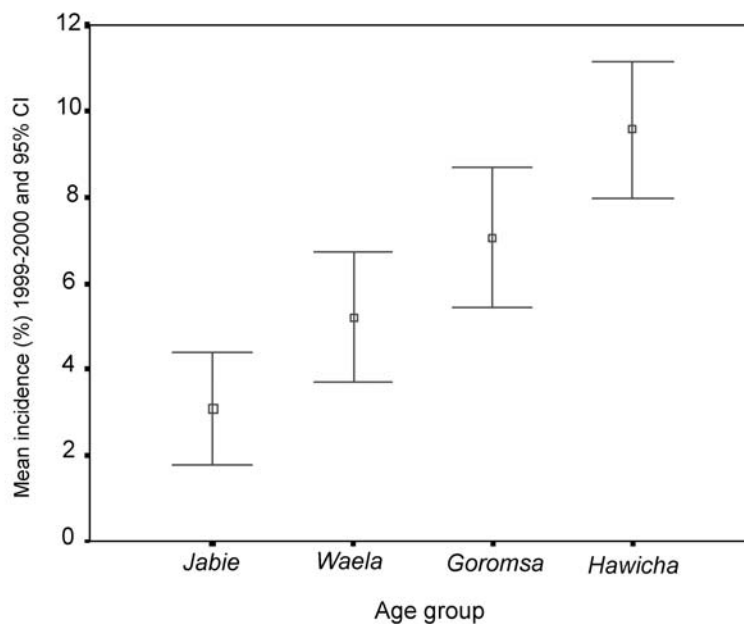
Figure 1
a. Mean incidence of *gandi*/trypanosomiasis in Orma cattle by age group, 1999-2000

Age groups:
Jabie 0-2 years
Waela 2-3 years
Goromsa 3-4 years
Hawicha > 4 years

(n=50)

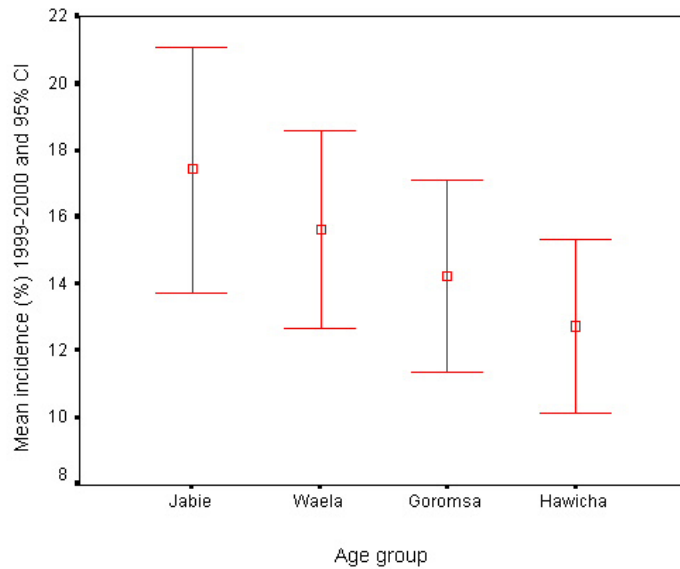


b. Mean incidence of *bukula* acute trypanosomiasis in Orma cattle by age group, 1999-2000

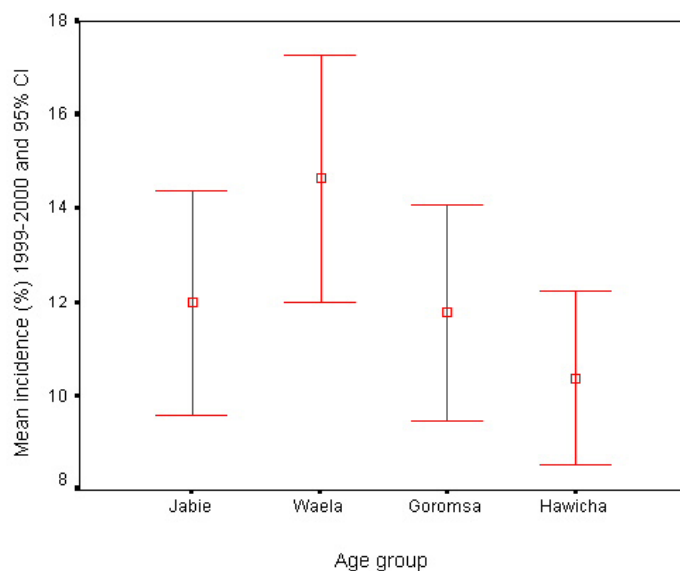


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c. Mean incidence of *hoyale*/FMD in Orma cattle by age group, 1999-2000

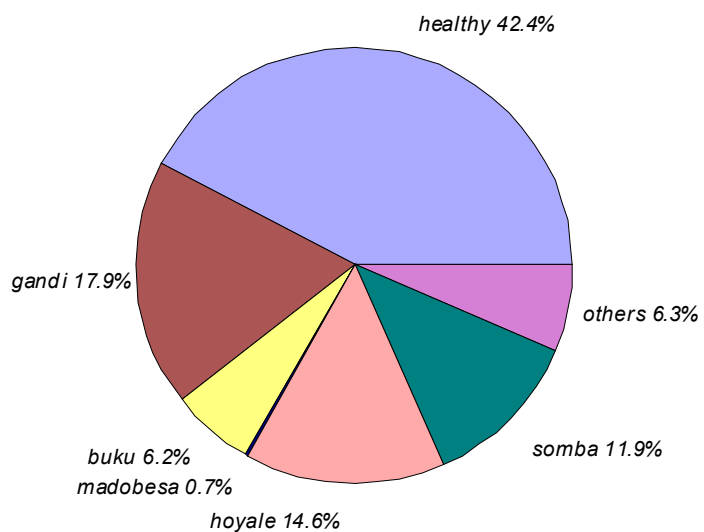


d. Mean incidence of *somba*/CBPP in Orma cattle by age group, 1999-2000



Results from this kind of proportional piling can also be presented in pie charts.

Figure 2
Mean incidence of important cattle diseases relative to healthy cattle (all age groups) 1999-2000.



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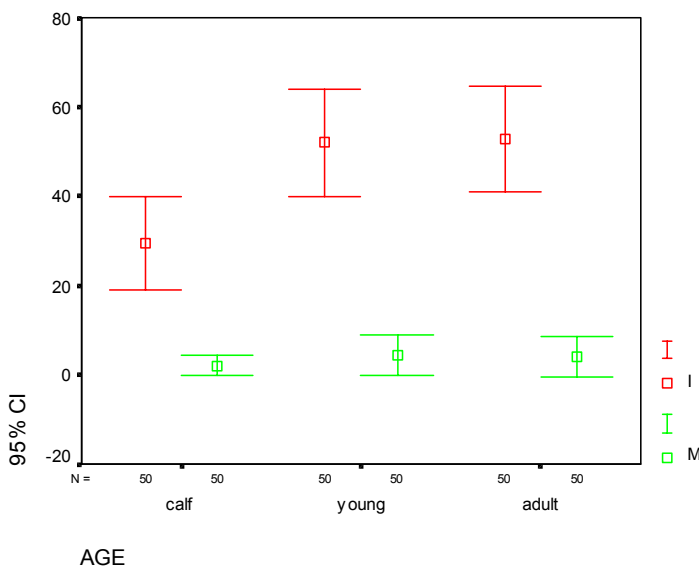
Example 2 Assessing cattle disease incidence and mortality in Maasai herds, Morogoro, Tanzania

A similar proportional piling method to that described above was also used to estimate disease incidence in Maasai herds in Tanzania. However, the method was taken a step further by also including mortality. With this method, the 'incidence' piles for each disease are further sub-divided into animals dying and animals surviving. The piles of stones for the dead animals represent the mortality for each disease.



Like the method used in Example 1, this proportional piling was repeated for each age group of cattle and with 50 informants.

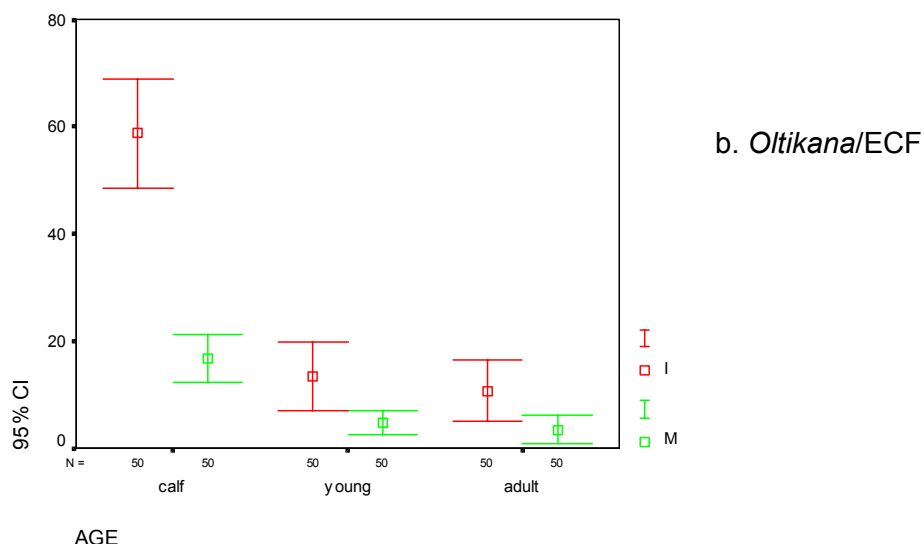
Presenting the data



Again, results for each disease and age group were summarised as mean incidence and mortality and 95% confidence intervals. Results can be presented, for example, as shown in Figure 3.

Figure 3. Estimated incidence and mortality of some cattle diseases in Maasai herds (I = incidence; M= mortality)

a. *Endorobo/trypanosomiasis*

Participatory Epidemiology: A Guide for Trainers**3. Assessing validity**

Proportional piling methods to assess disease incidence or mortality should only be used after informal interviews, matrix scoring and other methods have been used to understand local disease characterisations and names.

The validity of data derived from these types of proportional piling methods can be assessed in various ways.

- Seroprevalence (e.g. FMD, CBPP) and parasitological diagnosis (e.g. trypanosomiasis) by age group can be used to cross check the data. However, in the case of serological surveys, remember that we're usually assessing antibody prevalence not disease incidence. Also be aware that tests with low sensitivity will underestimate antibody or parasite prevalence.
- When disease incidence and mortality patterns by age are well described in textbooks, a judgement can be made by veterinarians by comparing the age trends with conventional thinking. For example, Figures 1a and 2a describe the expected age trend for trypanosomiasis, with increasing incidence with age. In comparison, Figure 2a also fits conventional thinking with higher incidence and mortality of calves due to ECF relative to adults.

4. Recent uses – disease modelling

Proportional piling has recently been used to generate herd structure and age-specific mortality data to estimate the basic reproductive number R_0 for rinderpest and build disease models.

This approach enables models to benefit from indigenous knowledge on disease behaviour and is described in Jeffrey Mariner's work on rinderpest modelling in southern Sudan.

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Handout 16

Handling the data

In veterinary epidemiology there are few examples of statistical analyses of data derived from participatory methods. Therefore, much work remains to be done to determine which tests are most appropriate for PE methods. These notes are drawn from published papers and therefore, the statistical tests suggested here have been subject to peer review. This is not to say that the tests are necessarily correct.

1. Matrix scoring

Assume that a standardised matrix scoring method is developed for a particular research objective and that method is repeated with different informants. If the method is repeated 10 times, the results will comprise 10 matrices.

What kind of data do we have?

The numbers in each cell of a matrix are **discrete** data. This means that the numbers can only be whole numbers e.g. 1, 2, 5, 10. This situation arises because the counters used in the exercise (the stones or seeds) are not divisible. An informant cannot allocate 4.25 stones to a particular disease but only 4 stones or 5 stones. The data in a matrix can also be described as **ordinal** or **ranked**.

What kind of statistical tests can we use?

If data derived from matrix scoring is ordinal, **non-parametric** statistical tests must be used. Compared with parametric tests, non-parametric tests do not require data to be normally distributed.

How do we measure the average of the data?

The **median** is the most commonly-used average measure for ordinal data. Note that this compares with the mean, which is used for continuous, normally distributed data.

Which measures of spread can we use?

Measures of spread for ordinal data include the minimum and maximum values (the 'range') and the 95% confidence interval. Although a non-parametric test to calculate 95% CI for ordinal data exists (e.g. Gardner et al., 1992), epidemiologists and statisticians have varying opinions concerning the value of this calculation.

Example

Refer to Figure 2, Handout 12. This shows a summarised matrix scoring derived from 12 informant groups. The top left hand cell of this matrix relates to the disease-sign 'chronic weight loss' and the disease called 'liei'. The cell shows that median score allocated to this cell from the 12 informant groups was 10 and the 95% CI were 6.0-16.0. Median scores and 95% CI are presented in each cell of the matrix i.e. for each disease-sign and each disease.

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Assessing levels of agreement between informant groups

In addition to summarising matrix scoring data using medians, 95% CI and ranges, we can also ask the question *'To what extent did different informant groups agree with each other?'*

To do this, a non-parametric test called the Kendal coefficient of concordance (W) can be used. For a full description of this test and some methods for calculating W see Siegal and Castellan (1994).

In summary, the test is a measure of the association between sets of ranks assigned to objects by judges (or groups of judges) and computes a W value between 0 and 1. A high or significant W value means that the judges are ranking the objects using a similar standard. The test is particularly useful for determining inter-judge reliability (Siegal and Castellan, 1994). Also bear in mind that a test that is reliable is more likely to be valid than a test which is unreliable.

Example

Again, refer to Figure 2, Handout 12. A W value has been calculated for each disease-sign. In other words, taking each sign in turn the researcher has tried to assess the level of agreement between the 12 informant groups. For 'chronic weight loss', $W=0.51$. According to statistical tables for W, $p < 0.001$ if $N=12$. This result indicates very good agreement between the 12 informant groups.

2. Seasonal calendars

For the purpose of data analysis, seasonal calendars are comparable to matrix scoring. If a standardised seasonal calendar is used, the data is ordinal and rules for non-parametric tests apply. The median, range (or 95% CI) and W can all be used with seasonal calendar data.

Example

Refer to Figure 2, Handout 14. This summarised seasonal calendar was derived from 10 informant groups and in each cell, shows median scores and 95% CI. In addition, levels of agreement between the 10 informant groups have been calculated. Compare the agreement for the indicator 'rainfall' with that for 'cual' to see how levels of agreement can vary for different indicators.

3. Proportional piling

In proportional piling, it is usual to begin with 100 stones and divide these stones against various items or diseases. Compared with matrix scoring or seasonal calendars, a larger number of stones is used and typically, informants do not count the stones when assigning them to particular items. Instead, they simply group the stones into piles which show visually the varying amounts of the items being scored. For this reason, it has been argued that data derived from proportional piling can be described as continuous data and therefore, parametric statistical tests can be used. However, the issue of whether data produced by proportional piling should be summarised and analysed using parametric or non-parametric tests remains to be explored further. It may also depend on the type of sampling used to identify the informants i.e. random or non-random sampling.

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Example

Refer to Handout 15. Under example 1, a standardised proportional piling method was developed and repeated with 50 individual informants. Data was collected on 5 cattle diseases plus a disease category called 'other', for 3 age groups of cattle. The data was summarised using the mean and 95% CI for each disease and age group, and then presented graphically in Figure 1.

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Annex 2

Resource materials for participatory epidemiology

TRAINING MANUALS AND BACKGROUND INFORMATION ON PARTICIPATORY APPROACHES AND METHODS

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Annex 3

Example of an evaluation form

Please circle the appropriate number to record your views

Were the training objectives relevant to your work?	Highly relevant 5 4 3 2 1 Not relevant
Were the training objectives achieved?	Achieved 5 4 3 2 1 Failed to achieve
Relevance and value of handouts	Highly relevant 5 4 3 2 1 Not relevant
Training approach/methods	Very good 5 4 3 2 1 Very poor
Time allocated to practical work ¹	Too much 1 2 3 4 5 4 3 2 1 Just right Too little
Time allocated for working groups and discussion	Too much 1 2 3 4 5 4 3 2 1 Just right Too little
General organisation and logistics for workshop	Very good 5 4 3 2 1 Very poor
Value and relevance of field work	Very good 5 4 3 2 1 Very poor
Time allocated to field work	Too much 1 2 3 4 5 4 3 2 1 Just right Too little
What is the likelihood of you using PE methods in your future work, or helping others to do so?	Very high 5 4 3 2 1 Very low
Accommodation and food in training venue	Very good 5 4 3 2 1 Very poor

If you would like to make any comments, please write them overleaf.

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African Union/Interafrican Bureau for Animal Resources
PO Box 30786
00100 Nairobi
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