Participatory Epidemiology

A Toolkit for Trainers

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One Medicine Approaches to Participatory Epidemiology: Achieving Early Disease Detection by Orienting Public Health Goods to Stakeholder Priorities

Cover Photo

A participatory epidemiology practitioner interviewing a traditional healer in Pakistan.

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Chapter 1. Introduction and Background

What is Participatory Epidemiology?

Participatory epidemiology (PE) is the use of participatory approaches and methods to improve our understanding of the patterns of diseases in populations. These approaches and methods are derived from participatory appraisal.

Often we are faced with situations in which conventional epidemiological approaches are not adequate to fully comprehend the situation and find viable solutions to possible problems. Often quantitative data is difficult to correctly interpret without contextual information. This can be the case in rural areas or in urban and peri-urban settings where veterinary services are available. The purpose of PE is to enable public health professionals, veterinarians, government officials and local people to work together to appraise and analyze situations and then to plan programs which are appropriate to their particular region[1]. PE makes use of all types of available data, information and knowledge including laboratory results, information from quantitative studies as well as qualitative data.

Applications of PE:

PE studies

- Early applications of PE focused on needs assessment when establishing community-based animal health programs.
- Basic epidemiology studies to understand local knowledge, practices and attitudes in relation to animal diseases.
- Qualitative studies to provide the context and contribute to more accurate analysis and interpretation of quantitative epidemiological studies.
- Studies to define intervention strategies that will be compatible with local practices and enjoy stakeholder ownership

Participatory Disease Surveillance (PDS)

- Case finding for a disease to detect introductions, document presence or target control measurements
- A component of processes to demonstrate disease freedom as in the case of the global eradication of rinderpest (a disease of cattle caused by a morbillivirus).

Roles of Personnel in PE Programs and Training Needs:

It's important to take a moment to discuss the different roles of personnel that make up the staff of a PE programs, whether it is a research undertaking or component of a surveillance

[1] Jost, C.C., Mariner, J.C., Roeder, P.L., Sawitri, E. and Macgregor-Skinner, G.J. (2007). Participatory epidemiology in disease surveillance and research. Office international des epizooties revue scientifique et technique, 26(3), 537-549.

program. Looking across a number of programs four basic categories of staff have often been involved:

- Managers – individuals who will coordinate and direct implementation
- Practitioners – individuals who will carry out PE activities in the field
- Trainers – individuals who will facilitate introductory training programs including an introductory training workshop, mentored field studies and a final refresher training
- Data analyst – individuals who will aggregate and analyze data and contribute to the preparation of reports under the guidance of managers
- Academics – Individuals who will mentor students and supervise reseach

Training needs by category:

Category	Training and Experience
Manager	• Decision-maker workshop • Introductory training • Practice during training
Practitioner	• Introductory training • Mentored field study • Refresher training • Annual refreshers
Trainers	• Proven practitioner • Training of trainers course • Mentored training experience
Data analyst	• Introductory training • Mentored field study • Refresher • Annual refresher
Academics	• Introductory training with emphasis on research applicaitons • Mentored field study • Refresher training • Training of trainers

It is important that all staff have had completed an introductory training course in PE for practitioners. This is so that all involved are aware of the tools, their appropriate use and the appropriate use of the information that results from the program.

Purpose and Objectives of This Toolkit for Trainers

This toolkit is intended for certified trainers who will implement introductory training programs in PE.

Introductory training courses in PE are tailored to adult students and mid-career professionals. Adults learn differently from young people. For the most part, adults learn through discovery of information rather than through passive participation in presentations. Effective PE trainers think of themselves more as facilitators than as teachers. PE trainer creates a series of situations where trainees can learn through experience, synthesis, problem solving or from each other.

Many training courses in PE have been given in the past years by individuals and organizations. In addition to training PE practitioners, also training courses for trainers have been provided. This publication collates the information of the handouts of the different introductory PE training courses in one comprehensive manual.

The toolkit is composed of chapters structured in the same way for easy reference. Depending on the needs of the trainers, chapters and/or PE tools can be selected for different training courses. The assumption is that the participants of these training courses are veterinarians or public health professionals. The toolkit aims to provide training ideas and guidance to trainers but is not meant to be prescriptive. Our hope is that based on the feedback from the trainers this document becomes a dynamic publication adaptable to the different contexts worldwide.

Chapters 2 and 3 are general material cover the topics of adult learning and training course organization. Chapter 4 presents guides for preparing selected training session and is intended for the use of trainers in preparing their own training session plans. The toolkit includes sample handouts to assist PE training at the end of chapters. These can be photocopied and distributed to trainees as part of the session. Annex I provides an example of an introductory training course agenda, Annex II is provides some definitions of key epidemiologic concepts and terms which should be familiar to the trainees by the end of the course. A list of useful publications and resource materials is attached as Annex III.

Chapter 2: Principles of Adult Learning

Introduction

This chapter is meant as background information for trainers and is not designed to be taught to trainees of a PE course. After reading this chapter the reader should:

- Understand the characteristics of adult learning and its differences with other types of learning;
- Understand the existence of different trainer and trainee types and how to maximize these difference during a training course
- Understand a variety of issues in relation to presentations.

According to the Oxford dictionary, an adult is a person that is fully grown or developed. According to Corder (2002)[2] adults may well have most of the following characteristics:

- They are above the age of compulsory education
- They have some experience of life and the world of work
- They have family responsibilities
- They have domestic responsibilities
- They are reasonably independent
- They are able to make their own judgments about the world around them

And most importantly: this may not be their first learning experience

Adult education is an intervention into the ordinary business of life--an intervention whose immediate goal is change, in knowledge or in competence. An adult educator is one, essentially, who is skilled at making such interventions.[3]

Andragogy and Pedagogy

There is a difference between teaching children and teaching adults. Andragogy is the art and science of helping adults learns.[4] This contrasts with pedagogy, a term used for education of children.

Malcolm Knowles is a pioneer in the area of adult learning. He made a series of assumptions regarding adult learning:

1. The need to know — adult learners need to know why they need to learn something before undertaking to learn it;
2. Learner self-concept —adults need to be responsible for their own decisions and to be treated as capable of self-direction;

[2] Corder, N. (2002) Learning to Teach Adults: An Introduction. Routledge Falmer.

[3] Courtney, S. (1989) 'Defining adult and continuing education' in S. B. Merriam and P. M. Cunningham (eds.) *Handbook of Adult and Continuing Education,* San Francisco: Jossey-Bass.

[4] Malcolm Knowles (1998). The adult learner: The Definitive Classic in Adult Education and Human Resource Development. Houston, TX: Gulf Publishing.

3. Role of learners' experience —adult learners have a variety of experiences of life which represent the richest resource for learning. These experiences are however imbued with bias and presupposition;
4. Readiness to learn —adults are ready to learn those things they need to know in order to cope effectively with life situations.
5. Orientation to learning —adults are motivated to learn to the extent that they perceive that it will help them perform tasks they confront in their life situations

The following table summarizes the basic differences between traditional pedagogy and andragogy.

Table 1 Differences between pedagogy and andragogy

	Pedagogy	**Andragogy**
Self Concept	Dependence	Independence/ self direction
Organization design	Bureaucracy	Reduced hierarchy, Team-based, High performance
Organization goals	Slow-changing, Highly structured	Fast-changing, Dynamic
Organization climate	Authority-oriented, Formal/closed, Competitive	Respect-oriented, Informal/open, Collaborative
Preconceived notions about the topic	Rare/does not matter	Very high - matters a lot
Background (age, level of understanding, culture)	Almost similar	Diverse
Level of skepticism towards the instructor	Low	High
Purpose of intervention	Orientation, Instruction, Acquisition of knowledge	Change, Development, Up gradation of knowledge
Evaluation of the Process	One sided (testing the student)	Two Way Process (evaluating the process and the trainer)

> It is the supreme art of the teacher to awaken joy in creative expression and knowledge.
>
> — *Albert Einstein*

Learning occurs throughout our lives, it is a continuous process, however, people learn at different speeds and a facilitator should keep that in mind while conducting a training course. Often we can understand or remember things better when we have seen a demonstration or read about an application of what is being taught. This is because learning results from stimulation of the senses. It is the facilitator's task to stimulate as many senses as possible to encourage learning.

To ensure that adults learn there are four critical elements of learning that should be addressed:

1. Motivation – the topic should be of relevance to their day to day work and it should be clear how they will benefit from it.

2. Reinforcement – correct wrong behavior and reinforce encourage correct behavior that the participants are already doing.
3. Retention – be clear on the objectives of the training course (purpose of the information).
4. Transference – the participants need to be able to transfer the learned skills to their local situation.

Key Training and Leadership Styles

Every facilitator has a unique style and training preferences of their own. Some are more prescriptive, others allow the participants to take an important role in the session. The two extremes are explained below:

Directive: The trainer provides instructions about "what" and "how" goals and tasks are accomplished. At the end supervises the individual's performance.

Supportive: The trainer listens, encourages and facilitates self-reliant learning.

This is not a strict distinction, although we all have our own style, in some situations we need to be more directive while in other situations we can be more supportive. In general, in participatory training course we try as much as possible to be a supportive trainer encouraging participation of all participants.

Directive leader instructs… Supportive leader facilitates…

Learning Styles

> "Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand."
> *Confucius around 450 BC*

Honey and Mumford (1982)[5] defined four learning styles: Activists, Reflectors, Theorists and Pragmatists.

Active Learner – Activists involve themselves fully and without bias in new experiences. They tend to act first and consider the consequences afterwards.
Reflective Learner – Reflectors like to stand back to ponder experiences and observe them from many different perspectives. Their philosophy is to be cautious.
Theorizing Learner – Theorists adapt and integrate observations into complex but logically sound theories. They assimilate disparate facts into coherent theories.
Experimental Learner – Experimental learners or pragmatists are keen on trying out ideas, theories and techniques to see if they work in practice.

The characteristics of the four learning styles are summarized in Table 2.

Apart from understanding the different types of learners, as trainers of adults we need to understand the different reasons for people to attend a training course:

[5] Honey, P & Mumford, A, (1982). The Manual of Learning Styles. Maidenhead, UK, Peter Honey Publications.

- *Social* – to make new associations or friends;
- *External Expectations* – to comply with instructions/recommendations from a formal authority (bosses);
- *Social Welfare* – to serve the community better, improve ability to serve;
- *Personal Advancement* – to achieve higher status in job, secure professional advancement and stay abreast of competitors;
- *Escape/Stimulation* – to relive boredom, break from routine;
- *Cognitive Interest* – to learn for the sake of learning.

Table 2 Characteristics of the four styles and related activities

Learning style	Attributes	Activities	Opportunities
Activist	Activists learn by doing. They need to get their hands dirty, to dive in with both feet first. They have an open-minded approach to learning, involving themselves fully and without bias in new experiences.	• brainstorming • problem solving • group discussion • puzzles • competitions • role-play	• interactive learning • group work opportunities • communication and virtual classroom (Chat)
Reflector	Reflectors learn by observing and thinking about what happened. They may avoid leaping in and prefer to watch from the sidelines. Prefer to stand back and view experiences from a number of different perspectives, collecting data and taking the time to work towards an appropriate conclusion.	• 1 on 1 discussions • self analysis, & personality questionnaires • down time • observing activities • feedback from others • coaching • interviews	• problem-based learning • presentation of content from a variety of perspectives • discussion groups allow asynchronous communication – time to reflect before contributing
Theorist	These learners like to understand the theory behind the actions. They need models, concepts and facts in order to engage in the learning process. Prefer to analyze and synthesize, drawing new information into a systematic and logical 'theory'.	• models • statistics • stories • quotes • background information • applying theories	• concentrate on concepts and theories presented in a variety of ways • discussion groups could facilitate more thorough debate around theories than in a time-limited seminar
Pragmatist	Pragmatists need to be able to see how to put the learning into practice in the real world. Abstract concepts and games are of limited use unless they can see a way to put the ideas into action. Experimenters, trying out new ideas, theories and techniques to see if they work.	• time to think about how to apply learning in reality • case studies • problem solving • discussion	• interactive learning • problem-based learning

Effective Teaching Styles for Adults

Because of the aspects highlighted earlier, it is important to adapt our facilitation styles to our audience, trying to accommodate for the different learner styles. Below are some points to keep in mind when facilitating sessions for adults:

- Adult learning is a 2-way process: adults have a lot of experience and can contribute to the sessions with real live examples or bring up situations where the issue being taught could have been of use.

- Although the trainer has the lead of the sessions he or she should treat the trainees as peers not as students.
- Because of the different learning styles, keep changing your teaching style to meet the needs of the different learner type.
- Encourage understanding rather than memorizing. The adult learner needs to be able to apply the new information in its daily live otherwise it will not be very useful for him.
- Create a respectful environment: everybody should be comfortable contributing to the sessions. For this to happen, be aware of dominant speakers and disrespectful behavior by other trainees maybe because of language issues or background.
- As a trainer: make sure that you listen to the participants and not just speak; similarly: learn from your participants, not just teach!
- In a participatory way agree on timing, basic ground rules and where appropriate topics.
- Be sensitive to cultural issues. This is sometimes difficult but try to familiarize yourself with the common practices if you go to a new country or region.
- Constantly motivate participants to learn and listen. A practical rule of thumb is that the attention span of an adult is 17 minutes. Be aware of this and try to do something different every 15 minutes to not lose their attention.

Body Language – Non Verbal Communication

The body language of a trainer is very important; it can make or break the training. Body language impacts a great deal of how we communicate, and can reflect quite accurately what's going on inside us but also inside the trainees.

As everywhere, the first impressions are important, keep this in mind when you conduct a training course. Try to be friendly, smile and engage everybody. Be natural, it is ok if you are a bit nervous; even for the most experienced trainer the first hours of a training course are always stressful.

There are several aspects we need to think of:
Body movements and posture – in order to include all participants it is often advisable to move around (more details on the seating arrangement in the next chapter). You don't want to be moving all the time but when you give a power point presentation the danger exists that you stay next to the computer for the entire duration of the session. This should be avoided. When working with a flip chart holder be sure you don't face the board all the time. Moving around is also a good way of silencing some participants that are having a side conversation…just your presence will make them stop. Try it…you will see it works! Movement is an important tool for adding emphasis. Stepping forward towards the audience when making a key point can be very powerful. Stepping forward to take a question shows respect for the audience.

Dress – the way you dress as a trainer is important. Often the first day of a training course is more formal since some official may attend for the opening sessions. Later in the course, you may be working with farmers and you will want to wear simple dress that makes them feel comfortable. In general, in PE training courses we dress a bit informal, but it is important that you are comfortable in what you wear and that the participants are comfortable with what you wear. It should allow you to move around freely since in these courses we often have activities on the ground when explaining the tools.

Eye contact – try to scan the audience to see if all participants are paying attention and make eye contact with a different people and speak to them.

Confidence – there is a balance between humble and confident. We assume you are knowledgeable about the subject, even if it is your first training course, the fact that you are a trainer should give you enough confidence to give a session. On the other hand you don't want to be perceived as arrogant, behaving as if you know everything. Always remember that participatory approaches are about co-learning, we learn every day from a variety of people including our trainees!

Voice – Nonverbal speech sounds such as tone, volume, rhythm are important communication elements. When we are nervous we tend to speak faster which may be a problem for some trainees to follow especially if the training course language is not their mother tongue. Be aware of this and make an effort to speak slowly.

The graph below shows the results of studies done that show us the percentage of understanding that is gained from the spoken word. It is considerably less than the meaning that people gain from listening to a person's tone of voice and looking at their non-verbal communication.

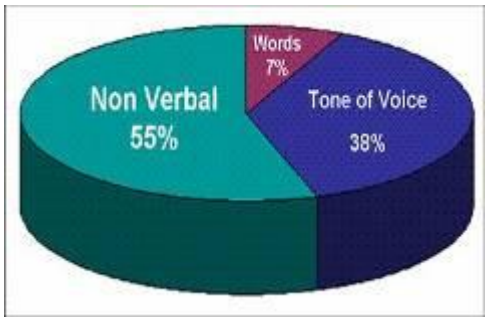

Figure 1: Understanding gained from spoken word.

Presentation Skills

In participatory training, presentations are usual limited to 10 to 15 minutes as a tool to introduce and orient the session. The core of the session should be built around activities of a role-playing or problem solving nature. Sessions usual end with a synthesis section were the facilitator draws out the key lessons and messages for the session from the participants themselves.

No one is born as a trainer but for some people it is less difficult to face an audience than for others. We can improve our presentation skills by practicing, this is very important to be clear in our mind what we want to say, when and how. Try to practice your presentation before a test audience such as your work colleagues or your family. Because they may not be familiar with some terminology you may use, it will help you find ways to explain technical concepts in normal language. This is very important to ensure that all participants (regardless of their background) understand what you mean.

When conducting the session during the actual training course be aware of the following:
Knowledge of the subject – research the topic if needed. Make sure that you are able to answer most questions. If you don't know something, be honest about it. You can ask your colleagues, or if you are alone: tell the audience that you will get back to them later in the day or the next day.
Breathe – When we are nervous we tend to forget and this can lead to tension. Sometimes it helps if you have something in your hands that you can put down; it can help you regulate your breathing.
Vary vocal pace, tone, and volume – A monotonous tone may lose participants' interest in the presentation.
Looks (personality, dress, appearance) – our looks shouldn't be too distracting for the audience. Avoid overdressing and under-dressing. Avoid shiny or noisy jewelry and very bright colors.
Interaction – try to include the audience by calling their names, this shows you are interested in them and that you believe they have something to contribute to the session.

Presentation Structure

As for the structure of the presentation organize ideas logically and keep focus, as mentioned earlier. Know what you want to say when and how. Where appropriate you can give examples but they should be short and to the point. A well organized presentation is easy to follow by the audience. In general, we always start a presentation in a general way, we focus on the topic of interest and we wrap up summarizing what we said. Figure 2 shows the presentation structure in a graphical way.

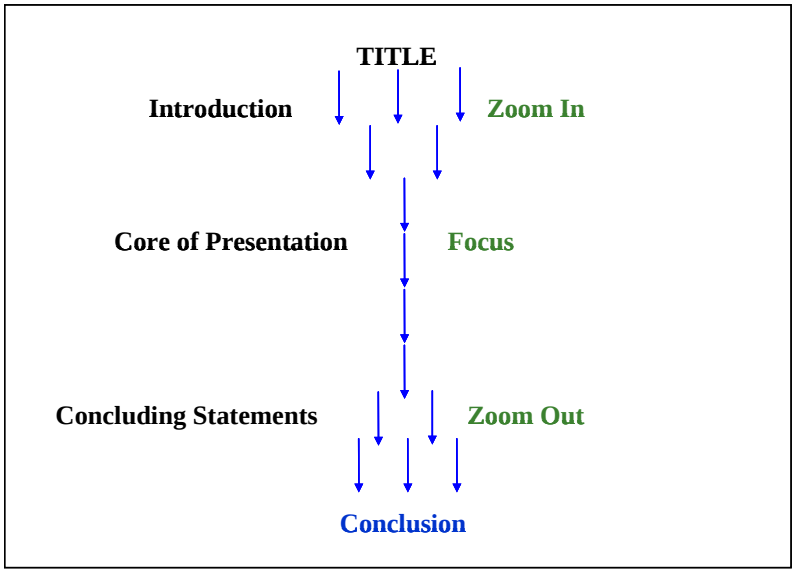

Figure 2: Structure of the presentation

"Tell them what you want to say, tell them and tell them what you told them"

Visual aids are very useful and important to deliver our message. Power point is frequently used these days for training purposes but it is not an effective tool for many training purposes. It use

for explaining some of the concepts in relation to participatory epidemiology is limited and should not be used for more than 2 or 3 hours in a week long training.

As you may have experienced yourself, when using a power point presentation we often forget to include the audience and are too focused on what is written on the screen. It is often better to work with flip chart papers and draw your audience in with a participatory approach. Remember, as the trainer, your behavior is a model for the trainees.

Some experts use the 10-20-30 rule for power point presentations:

- 10 slides are the optimal number to use for a presentation.
- 20 minutes is the longest amount of time you should speak.
- 30 point font is the smallest font size you should use on your slides.

Some comments on this rule:

Maybe 10 slides are too few, what we want to stress is that you carefully evaluate if you really need the slide or not. It is not realistic to have 20 slides and in a 20 minute presentation. You will lose your audience.

For the 20 minutes rule: also this should be flexible however, try to keep in mind that after 20 minutes adults often get bored. Try to introduce something else (such as group work or a demonstration of a tool). It's more effective to break a longer presentation in to two sessions or better yet, think of another way to communicate the message. Remember, adults do most of their learning through discovery, not be being told information.

Font size 30 is good; too often we try to put too much on one slide which makes the audience lose interest. If you are well prepared you only need some bullets to remind you of the topics (a bit like a checklist of things you need to mention).

Last but not least, for Power point presentations:

- Use a "calm" background to avoid losing focus on the content;
- Avoid animations on the slides, this is too distracting and the audience will be more focused on how the next will appear on the slide than on the actual content;
- Use one font type only;
- Check before the presentation how the presentation looks when using the projector since often these machines distort colors.

Further reading on adult learning

- Participatory Practices in Adult Education (2001) Editors: Burnaby, B., and Campbell, P. Laurence Erlbaum Associates, Inc, Publishers.
- Adult Learning and Development: Perspectives from Educational Psychology (1997) by M. Cecil Smith, Thomas Pourchot.

- Enhancing Creativity in Adult and Continuing Education: Innovative Approaches, Methods, and Ideas (1999) Editors: Edelson, P.J. and Malone, P.L. Jossey-Bass publishers

Chapter 3: Preparing for a PE Practitioner Training Course

Introduction

Advance preparation and planning will help the training course run smoothly and improve the outcome because both the facilitators and the participants will be more relaxed. Participatory training is as much about changing attitudes and behaviors as it is about learning new skills. Relaxed participants are positive and will be more likely to interact in a participatory manner with the facilitators.

Preparations for training course will vary in different regions because of differences in governance and culture. In some areas, close coordination with government agencies will be essential while in others this may not be as important. Other issues of local culture, including providing time during the day for activities such as daily prayer or having specific kinds of foods available, should also be taken into account. The planners should be fully aware of these issues and involve a number of local stakeholders in the planning process. Any training reports that have been written for the region should be reviewed by planners and facilitators in advance of the training. This may provide insight to local issues that may arise during the training and prevent the repeat of previous mistakes.

The following chapter will guide the preparation phase of a PE training program. Topics covered are broken into the following categories:
Program Assessment and Participant Selection
Budgeting and Logistics
Course and Session Content
Field Practice

Program Assessment and Participant Selection

Defining program objectives – A PE practitioner training course should occur at the beginning of a field study or during the development of a PDS surveillance system and directly train the future practitioners and managers who will implement the program. The first step in preparing the PE training is to understand the overall objective of the field investigations that the graduates of the training will be required to conduct. There is often a reason that a PE training is proposed at a certain time in a specific area. It may be a reaction on the part of government agencies, international donors, NGOs, or other stakeholders to a new disease outbreak of economic or zoonotic importance, a suspected change in disease incidence, or the recognition of a weakness in an existing surveillance system. Program objectives should be clearly defined before preparation of the training proceeds.

Assessment of program needs – After establishing the object, the current capacity of the surveillance and epidemiology program of the region should be assessed. This should go hand-

in-hand with a short assessment of the epidemiological problem on the ground and the knowledge of the communities involved on the subject. How will PE fit into the current system and what aspects of PE are best suited to the problem? Stakeholders may wish to consider revising objectives based on the results of the assessment.

Planning with decision makers – Key decision makers must be aware of the program that is being proposed and fully briefed on the principles, benefits and weaknesses of PE. Ideally a meeting or workshop should be held to reach consensus on how the training will benefit the overall surveillance and epidemiology program in the area. As many decision makers will not have been exposed to participatory approaches previously in their career, it is often useful to expose them to the use of PE tools with livestock owners in the workshop. Buy-in from key decision makers helps ensure sustainability and financial support for future PE activities. Decision makers should be involved in planning the training program to the extent that is appropriate for the circumstances.

Selection of trainees – Decision makers meetings should also involve a discussion on the selection criteria for the trainees and the optimum number of participants. There should be consensus on who will make the final selection of participants. It is recommended to have a maximum of 15 but the program budget may limit this. Having a larger group causes certain individuals to be reluctant to participate and a larger group will limit the effectiveness of the training.

For introductory training programs for practitioners, it is important to directly train those will implement the program (practitioners and managers). The practice of training more senior individuals who will then pass on information to those actually implementing the program in the field has generally resulted in low quality work in the past.

PE investigators are often required to work in remote places and interact closely with livestock keepers; therefore, field veterinarians are often the best participants. Participants should be selected who are familiar with fieldwork and can use the techniques in their daily activities. Participative training techniques require trainees to be responsible for their own learning and invest time and effort into the training. This will be more likely to occur if the participants can see the how PE will be useful in their work. Other considerations, such as gender, education level, and experience should also be taken into account during the selection process.

Facilitators – Although it is possible for one trainer to manage 15 participants, having two experienced trainers who have completed a training of trainers program, especially if they have different training styles, can help to make the training more effective by keeping it lively and interesting for the participants. If possible, A third person working to handle administration and logistics, especially those related to field practice, computing and projecting, payments of per diem, and meals and accommodation, will help the program run smoothly. Local facilitators are ideal so that they are familiar with the language and culture of the area. If there are no local

facilitators trained and available outside facilitators should be used but it must be determined in advance if translation will be required.

Assessment of training needs – Facilitators should become familiar with the background of the trainees in advance of the training, if possible. For example, are the participants veterinarians? Do they have knowledge and experience in epidemiology and disease surveillance? Do they have knowledge and experience of participatory approaches? Having this insight will help guide program and session planning and determine the depth to which certain topics may be explored. A participant questionnaire may be administered on the first day of training to gain more specific insight into their knowledge and experience (see Chapter 4a) and facilitators will quickly learn about the personalities and knowledge of the individuals as the training progresses. The influence of culture on attitudes, communication styles, and expectations can have an important impact on training needs. The trainers should consider this in designing the program and should be prepared to adapt the training plan during the course of the work as they learn more through interaction with the participants.

Budgeting and Logistics

Budget – Successful training programs require adequate budget. This includes sufficient funds in light of the number of participants and the necessary length of the training program but also specific details such as the venue, refreshments, transportation, accommodation and materials and equipment. Be aware that a full PE training cycle is comprised of a 10-day introductory course, a field work period of a minimum of 20 days and a refresher course of 3 to 5 days. Cutting corners to save cost at this critical time will have impacts on the quality of epidemiological programs that far outweigh the savings on training. The budget for field work and the refresher should be programmed at the same time as the introductory course. Upon completion of the introductory course, it is much more effective if trainees can to move directly into mentored field practice phase.

Length of training course – Experience has shown that about ten days is the optimum length for an introductory PE training and this length is the basis for this training manual. Other considerations, however, such as the availability of participants and the program budget should be taken into account. Participatory training methods are recognized to be extremely effective, especially for adult education, but they also take a significant amount of time. As mentioned, learning PE methods goes beyond simply learning a set of skills and requires a change in attitudes and behaviour. Enough time should be allotted for participants to practice the PE tools with guidance. In addition to the overall length of the program, facilitators and planners should also decide if the training will be continuous or include a break. How long should this break be? Factors such as distance travelled and time spent away from family and regular work duties should be taken into consideration.

Materials and equipment – A PE training course does not require specialized equipment. Basic requirements include:

Flipcharts, marker pens and masking tape
Overhead or LDC projector with laptop (depends on venue and facilitators preference)
Index cards (preferably in a variety of colors)
Counters and bags to hold them
Handouts
Notebooks, binders, staplers, and pens
Certificates for trainees (after completing the refresher course)
Optional:
CD-rom or USB stick with training materials
GPS units
Sampling, field diagnostic, and personal protective equipment
Live animals for sample collection

Location and training venue – The training should be held in an area with relatively easy access to livestock keepers for fieldwork practice. Ideally, it should be the same or a similar region to the area where the PE activities will be conducted. The training venue should be comfortable and away from distractions such as participants' offices or government headquarters. Rural venues are preferable as they help to put the training in context and limit distractions. The training center should be well-equipped with a flexible room so that chairs and tables can be moved around and participants can spread out for group practice sessions. There should be blackboards or whiteboards, flipcharts, projectors and plenty of wall space to display ground rules, expectations and fears and various examples of other PE tools as they emerge during the training.

Seating plans – The seating arrangement during the training affects the level and nature of communication and participation. A strict arrangement of tables and chairs may be desirable during a formal opening or closing ceremony. After the opening, tables can be removed and the chairs placed in a semi-circular. This removes barriers between the participants and provides all with an equal seating status. If tables are needed, tables can be arranged in fishbone structure or banquet set up.

Figure 1: Fishbone structure and banquet set up

Chambers (2002)[6] explains the uses of the different seating arrangements as follows:

[6] Chambers, R. Participatory Workshops: A Sourcebook of 21 Sets of Ideas and Activities (2002) Earthscan Publicatons Ltd, London, UK.

- The fishbone structure has tables rotated through 90 degrees. It is more participatory and table/group centred. It is easy to do group work this but some participants may have to turn their chairs the trainer.
- Banquet seating puts even more emphasis on groups. It allows for decentred cross conversations between people at different tables better than the fishbone and can leave a useful centre space. It is best to remove the head table, to create a feeling of more direct communication between the facilitator and participants, except that if you use PowerPoint presentation you will still need a small table and a screen.

We prefer to remove the tables so that there are no physical barriers between trainer and participants. PE work in the field often involves sitting on the ground or a mat and we encourage this behaviour in the classroom through conduct of group activities on the floor (Figure 2). Participants should be advised to wear appropriate clothing and proper attention should be paid to keeping a clean environment. It is not unusual for participants to initially request tables or a more formal seating arrangement (to take notes, etc.) as the open, informal arrangement encourages new behaviours and may make some feel vulnerable. In such cases, politely encourage them to try the arrangement, and as all materials are presented in the handouts, full involvement is encouraged over note-taking.

Figure 2: Southeast Asian trainees role-playing proportional piling for morbidity and mortality on the floor with flip chart paper.

Invitations – Formal invitations to the training should be sent in good time and include objectives, agenda, and venue for the training. Participants should be requested to confirm their availability so that replacement participants can be invited in case of any regrets. Although the trainers should do their best to assure that invitations clearly describe the course, they should not assume that an invitation will be an effective communication tool. At the opening of the course, trainers should take time to learn what the participants have understood as the purpose of the course and their expectations.

Course and Session Content

Training course agenda – Detailed content of the training agenda will depend on the program objectives and the training needs of the participants. A variety of training methods should be used to maintain interest and promote participation and learning by the adult participants. This topic has been previously discussed in Chapter 2. A simple rule of thumb is that 30% of time should be allocated to background, concepts, and explanation of techniques, 30% to in-class practice and role-playing and 40% to actual mentored field practice with livestock owners. For many trainers, the challenge is to say less and let the participants do more! See Annex 1 for an example of an agenda for a 10-day training course. Each day should start with a review of the topics that were covered on the previous day. The daily timetable will depend on local norms and should be flexible enough to allow for changes when deemed necessary or prudent. Energizers should be a regular part of the program and included in an impromptu fashion when needed. Participant body language and other non-verbal communication is often the best indicator of when an energizer is needed.

Training objectives –Training objectives should fall in line with the overall program objectives previously discussed. These objectives should state the skills and abilities that the trainee will obtain from the course. Training objectives are action oriented. They should be things that the trainees will be able to *do* upon completion of the course. The topics that will be covered during the training will be selected to meet these objectives and the time allocated to topics will be a reflection of their overall importance to the objectives and the complexity of the subject. The training course objectives match the expectations of the program in terms of what tasks the practitioners will be expected to perform to meet the overall programs objectives. The training objectives should be shared with the participants as part of the introduction of the training program and related to their future role in the PE program.

One example of PE introductory practitioner's course objectives is presented in Text Box 1

Box 1 Example training course objectives

- Describe the concept, principals and attitudes that contribute to successful application of participatory epidemiology
- Plan and implement a participatory study including:
  - semi-structured interviews based on an interview checklist
  - participatory exercises including visualization and scoring techniques
  - direct observation activities
  - synthesis of information and analyze of data
  - reporting of results

Due these objectives meet your programs needs? What's missing? Compare them to a different set of sample objectives provide in Text Box 1 in Chapter 4a.

Session plans – A well-organized trainer will make a detailed session plan for each module. Session plans are provided in each module of this training manual and include a variety of activities. An example session plan is presented is presented below. Session plans state the objectives of the session, the activities and estimated time for activities, a list of required materials and support materials made available to the trainees for use outside of the session. These should be reviewed by the trainer in advance and shared with colleagues for comments. Each session should contain some combination of activities that include "seeing, hearing and doing" on the part of the participants. Objectives of the module should be made clear to the participants at the beginning of each session.

Example of a Session Plan: Direct Observation

Objectives

- By the end of the session, the participants should be able to:
- Understand the importance of direct observation during PE data collection.
- Understand and demonstrate the use of transect walks.
- Understand the purpose of conducting clinical and post-mortem exams and the etiquette of handling privately owned animals as a researcher.

Session Planning • Discussion: Direct Observation in PE – 5 minutes • Presentation: Transect Walks – 20 minutes • Practice – 30 minutes • Presentation: Clinical and Post-Mortem Exams – 30 minutes Total time: about 1.5 hours
Materials Needed • Computer and Projector (optional) • Flip Chart Paper and markers
Support Materials on Training CD • Presentation on Transect Walks • Presentation Clinical and Post-Mortem Exams • Handout: Direct Observation – Transect Walks and Clinical/Post-mortem Exams

Ongoing evaluation – Evaluation of the training and participants' performance should be carried out at the end of the training but also continuously throughout. During the training, feedback from participants on their opinions can be collected using what is known as a "mood meter" in which participants can rate their mood and write comments about how the training is going. An example of a mood meter is shown in Figure 3.

Figure 3: Mood meter

The picture to the left shows an example of a daily mood meter. Mood meters can be used on a daily basis and participants should be able to post their comments anonymously. Facilitators should respond promptly to legitimate concerns that are raised. Participants are continuously evaluated during presentations and practical review sessions. Informal reviews that go both directions (from facilitator to participant and vice versa) can take place during breaks and in the evenings. End of course evaluation will be covered more extensively in Chapter 5.

Field Practice

Field practice is the heart of the training course. Participants need plenty of time with "real informants" in order to practice the skills learned in the classroom and develop the capacity to adapt methods to suit particular situations. Field practice sessions need to be planned well in advance. Each group of 3-5 trainees needs enough villages/groups of people to practice interviewing and use of PE tools during 4-6 field practice sessions. This is likely to require planning with local leaders before the training course to ensure that livestock keepers are informed in advance and the interview is at a convenient time for them. The timing for practical work should fit with the livestock keepers' availability. Adequate transport should be organised. It is usual to involve local authorities in organizing the field activities and this should be done in advance of the training. Often, the PE trainers have to work closely with local organizers to make sure the nature and purpose of the field practice is understood sufficiently to enable appropriate organization of the field practice.

The biggest challenge to setting up fieldwork is handling the livestock keepers' expectations after spending their time with the trainees. If the PE training fits into a larger animal health program that will be conducted in the area, the livestock keepers should be told about the program and what it will involve. The training may even be used as a starting point from which to launch the program. Often, however, the PE training will be a one-time event for the area where the training is conducted. In this case, the field practice coordinators need to be very honest with the livestock keepers and let them know not to expect any material goods such as

vaccines or medicines after the training session. Some may choose not to participate after knowing this, which is fine. Local animal health workers should be included in the planning of fieldwork and may also accompany the trainees to the field. In this case, the worker may be able to address the issues that are brought out during the practice session.

Planning for the field practice – The following should be addressed in advance of the field practice session:

- Consultation with local authority leaders on where and when the field practice will take place and permission to work in the area
- Background information on the livestock and management practices in the area to be sure they fit with program objectives
- Identification of a focal person to link and coordinate the training team with the local community (perhaps a local animal health worker)
- Meeting sites identified keeping in mind the possibility of inclement weather
- Timing of fieldwork should be convenient for the livestock keepers
- Official documentation of the field practice session including the number of interviews per day, number of practical days during the training workshop, number of participants [interviewees] expected per interview (5-15), number of interviewers per group (3-5) and sites of the meetings
- Transportation arrangements for participants
- Preparation of equipment and stationery for field work
- Last minute confirmation with communities to make sure they are ready to welcome participants. This should be done in person 1-2 days before the fieldwork session.

On the day of the field practice – The following should be addressed the day of the field practice session:

- Field practice focal person and trainers should brief the trainees on the situation in the field (number of informants to expect, what informants have been told about the fieldwork, etc), amount of time allotted for fieldwork, and what is expected of them after the fieldwork is completed
- Discussion on professional and culturally sensitive conduct in the field (including smoking, use of cell phones and digital cameras, etc)
- Trainees should be broken up into groups of 3-5 people and roles assigned (who will be the interviewer, who will be the data recorder, which tools will be used and who will explain them to informants and conduct them in the field)
- Each group should be accompanied by a facilitator or focal point
- Refreshments, equipment and materials gathered
- Transportation confirmed and driver briefed on behaviour during field practical

After the field practice – The following should be addressed after the field practice session:
Each group should prepare a short presentation on the results of their fieldwork. This may include:

- Group members and their roles
- Tools used
- Main results (will depend on checklist used)
- Self-assessment (what went well, what went wrong, what could be improved next time)
- Facilitators and focal points should give feedback on observations in the field

To make it more interesting the feedback format should vary for each field practice. A good way of comparing results of the different teams is to have flip charts covering different topics of the checklist on which each group can add their answer. Please see figure 3 for an example.

Figure 3 Overview of common diseases per team

Chapter 4a: Course Introduction and Objectives Session

Objectives

By the end of the session, the participants should:

- Be introduced to the other participants and the trainers
- Understand the objectives and agenda of the training course
- Decide on the basic ground rules and elect a team leader for the course

Session Planning

- Course Opening – 15 minutes
- Introductions and Ice Breakers – 30 minutes
- Discussion: Course Objectives and Agenda – 10 minutes
- Exercise: Expectations and Fears – 45 minutes
- Discussion: Course Ground Rules – 5 minutes
- Questionnaire and Discussion: Previous experience – 15 minutes

Total time: 2.0 hours

Materials Needed

- Flip Chart Paper and markers
- Index Cards
- Computer and Projector (optional)

Support Materials on Training CD

- Agenda Template
- Questionnaire: Previous Training and Experience

Course Opening

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 amongst participants and trainers. Occasionally, the formal opening and training require different rooms to provide appropriate environments meeting the different needs.

Introductions and Ice Breakers

Initially, participants will be cautious. Ice breakers are recommended so that participants feel comfortable and relaxed in the training environment. They are a great way for participants and trainers to get to know one another. The important principal is that everyone should meet others and speak at least once to the whole group. This activity overcomes an important communication hurdle for many.

Example Ice Breakers:

1. FIND SOMEONE: Participants are given a blank index card to write three statements about themselves such as their favorite color, hometown or hobby. They should NOT write their name on the card and the three statements should not relate to physical appearance or be otherwise obvious. Collect the cards and place them at the front of the room. Ask each participant to take a card that does not belong to them. Participants should mingle until they find the owner of the card. Once everyone has a match, the participants should introduce the owner of the card they selected.

2. BIRTHDAY PARTNER: Have participants mingle in the group and identify the person whose birth date (not year - just month and date) is closest to their own. The participants should find out two other things they have in common and introduce each other to the group.

3. NON-VERBAL INTRODUCTIONS: Divide the group into pairs. Taking turns, each member of the pair should communicate to their partner as much about themselves as they can without speaking or writing (drawing pictures is allowed). For example, they might draw a picture of their house or family. To make the exercise slightly easier, and to keep the group to time, the facilitator could call out the topics and when to changeover to the other partner. Finish the exercise by having everyone introduce their partner (verbally). Also allow the partner to make corrections and fill in missing details.

Discussion: Course Objectives and Agenda

The broad objectives of the course and the course agenda should be discussed with the participants. The objectives will vary depending on the purpose of the training and any follow-

up activities (see chapter 3 on course preparation). An example list of objectives is presented in Box 1.

The course objectives have most likely been defined among the facilitators and decision makers before the training course began. These objectives can be distributed and read out loud by the participants along with the timetable. Alternatively, a more participatory approach could be used. The facilitator may ask the participants what they expect the objectives of the training course to be. This can reveal important communication gaps in the preparations for the training program and possible issues regarding participant expectations that will need to be addressed. Based on their suggestions, the facilitators can then fill in any gaps that may exist.

Box 1 Example training course objectives

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

1. Describe the roles, principles, and methods of participatory epidemiology (PE)
2. Plan and implement PE, including:
    a. Developing and testing a PE hypothesis
    b. Developing a PE checklist
    c. Leading a semi-structured interview
    d. Applying PE tools, including visualization and scoring techniques
3. Carry out participatory disease surveillance (PDS)
4. Record PDS findings in a format suitable for incorporation into the national surveillance system
5. Assess, analyze, and report PE and PDS data
6. Design interventions suitable for disease control based on PE and PDS data

The course agenda should be reviewed and the trainers should make sure that the start, end and break times are agreeable with the participants. If needed the agenda should be adapted.

Exercise: Expectations and Fears

Once the participants clearly understand the objectives of the course, it is important for the facilitator to also understand the expectations and fears of the participants. This helps to identify any expectations that will not be covered by the course and address misunderstandings at the beginning of the course. By being aware of the fears of the participants, the trainer can keep these concerns in mind as the training progresses.

Each participant is given several blank index cards. On each card, the participants should be asked to write an expectation or a fear associated with the training course (i.e. What do they hope to gain from the training?). If possible, use cards of one color for expectations and another color for fears. Encourage each participant to come up with more than one but preferably not more than 3 expectations and fears.

Collect the cards and write the results on flip chart paper or tape the cards to the wall where everyone can see them. Group the expectations into broad categories. Discuss with the participants whether each expectation will be reached in the course and how. Some expectations may be beyond the scope of the course. Also address each of the fears and discuss how they can be mitigated. The fears may also lead into a discussion of ground rules for the course; for example, a fear about not finishing on time may be addressed by creating a rule about keeping to the timetable.

Box 2 Example expectations and fears from a PE training course for HPAI surveillance in Fayoum, Egypt (2009)

Expectations	Fears
The Egyptian doctors will deliver the information to us in a good way	We won't be able to apply what is learned
Gain more experience and understand the topics	The method is not suitable for the job which I want to do
Understand how to use PDS tools	Difficulty dealing with people and exposure to HPAI virus
Know how to deal and react with outbreaks, especially those involving household keepers	Not having enough practice in PDS
Learn a new topic	The sessions will be boring and too long
To be aware of participatory surveillance	Side talking
Acquire valuable information about AI	Wasting time
Meet new people	The colleagues are pessimistic
New experience	Won't be able to apply what we have studied
Enjoy learning	What we learn is far from the field that I want to join
Know the customs and traditions of other villages	Face difficulty with people when applying PDS
This method will help to protect and serve people	Face difficulties in covering remote villages
Good company	Afraid not to be able to apply what we learned
Transparency and clearness	Might not get along with the trainer

Discussion: Course Ground Rules

In order to alleviate some of the fears about the training, it is often beneficial to establish ground rules during the first session of the training. These should be voluntarily raised by the participants. The participants may also want to come up with a "punishment" for those

participants caught breaking the rules. Usually, this will involve some type of public performance, such as singing or dancing, or saying something about themselves that no one else in the room knows.

Box 3 Example training ground rules

1. Mobile phones turned off or on "silent" mode
2. Ask questions
3. Raise hand before speaking
4. Respect others' opinions
5. Participate
6. Sessions start and finish on time

The group should elect a team leader to serve as a contact point between the trainees and the facilitators. Complaints, comments, suggestions and requests from the participants should be channelled through this person to the facilitators. The team leaders should also be responsible for enforcing the rules so that this duty does not fall to the facilitators.

Discussion: Previous Experience

Give the participants 10-15 minutes to fill out the questionnaire on previous training and experience. Follow this by asking if anyone has participated in any epidemiological investigations or disease surveillance programs that they would like to share with the group. Did the program involve any participatory techniques? Has anyone ever conducted participatory rural appraisal?

The questionnaires can be reviewed by the facilitators during lunch or at the end of the day and will provide a sense of the starting point of each of the participants. Although the in-class discussion will give some idea of the background of the participants and lead into the review of basic epidemiologic principles, the questionnaires are useful for knowing about participants who are not dominant speakers. Some participants may have very little experience in epidemiology, surveillance, and participatory techniques but are not willing to speak up in front of the others. These individuals may need special guidance during the course.

Questionnaire: Previous Training Experience

Name:

1. Have you attended any training courses that included training in epidemiology or surveillance? Give dates, duration, location and description of training.

2. Have you been involved in disease surveillance during the course of your work? Describe the types of surveillance you have been involved in.

3. Have you attended any training courses that included training in participatory approaches e.g. participatory rural appraisal (PRA)? Give dates, duration, location and description of training.

4. Have you ever used participatory approaches during field work?
   Describe the participatory methods used, for what purpose, when and where.

5. Have you ever trained others in the use of participatory approaches?
   Describe what training was conducted, for what purpose, when and where.

Chapter 4b: Introduction to Participatory Epidemiology Session

Objectives By the end of the session, the participants should be able to: • Understand the principles of epidemiology • Understand the principles of participation. • Describe the evolution, applications, and methods of PE
Session Planning • Presentation: Basics on epidemiology – 30 minutes • Brainstorming: What is participation? – 30 minutes • Presentation: Introduction to Participatory Epidemiology – 30 minutes Total time: 1.5 hours
Materials Needed • Flip Chart Paper and markers • Index cards • Computer and Projector (optional)

Support Materials on Training CD
 	
• Presentation: Introduction to participatory epidemiology
• Handouts:
  ○ A typology of participation
  ○ Introduction to participatory epidemiology

References:

ILRI. Introduction to Participatory Epidemiology and its Application to Highly Pathogenic Avian Influenza Participatory Disease Surveillance: A Manual for Participatory Disease Surveillance Practitioners (2009) Nairobi, Kenya. Available online: http://hdl.handle.net/10568/367

Pretty, J.N., (1994) Alternative systems of inquiry for a sustainable agriculture, IDS Bulletin 25:37-47.

Basics of Epidemiology (30 minutes)

Q 1: What is epidemiology?

Write their responses on a flip chart and discuss. In the synthesis of the discussion suggest the following definition by tying it to the responses of the participants.

Epidemiology: the study of the distribution and determinants of disease in specified populations, and the application of this study to the control of health problems.

Q 2: What do we mean with populations?

Write their responses on a flip chart and discuss. Bring out the following message in the synthesis:

A population can be a group of individuals/animals/species. It is important that the study population is clearly defined in a study. For example: chickens in a village, households in a village, the poultry of a district, all children under 5 years of age from a country etc...

It is important to understand that disease does not occur on its own...

In infectious disease epidemiology, disease occurs due to the interactions among the **host** (animal), the **agent** (e.g. viruses or bacteria) and the **environment** in which the host and the agent are present (Figure 1). The factors influencing the occurrence of disease are called **determinants** (see Table 1). This is called the epidemiologic triad.

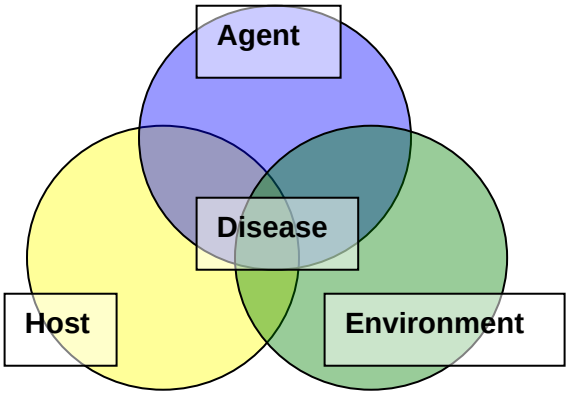

Figure 1: Interaction of host, agent and environment in the occurrence of disease.

Table 1: Disease determinants related to agent, host and environment

Determinants associated with the agent	Determinants associated with the host	Determinants associated with the environment
Virulence Pathogenicity	Genotype Age Sex Species and breed Immune status Stress	Location Climate Husbandry Social context

The Epidemiologic Approach: In simple terms, the epidemiologist

- **Counts** cases or health events, and describes them in terms of time, place, and host;
- **Divides** the number of cases by an appropriate denominator to calculate rates; and
- **Compares** these rates over time or for different groups or populations.

Brainstorming on Participation (30 minutes)

Q1: What is participation? What comes to your mind when they think of the word participation?

Write their responses on a flip chart and discuss.

Some examples might include:

- The process of involving people in projects, research or decision-making to encourage involvement and empowerment.
- The empowerment of people to find solutions to their own development challenges.
- Both an attitude and a philosophy that encourages learning, discovery and flexibility.

Q2: **What are some examples of projects or activities you have been involved in or read about?**

Write their responses on a flip chart and discuss.

Distribute the handout entitled: **A Typology of Participation**. Ask the participants to read the definitions out loud.

Ask if there are any questions about the different types of participation. After addressing the questions, ask the participants to classify the projects they mentioned and record their responses on the flip chart.

What is the most common type of participation that was used?

Presentation: Introduction to Participatory Epidemiology (30 mins)

Participatory appraisal – a family of approaches and methods that enable people to present, share and analyze their knowledge of life and conditions, to plan and to act. It is participatory, flexible, lightly structured, adaptable, exploratory, empowering and inventive.

Key principles of participatory appraisal:

1. Behavior and attitude
    - Listen, learn and respect
    - Act as a facilitator, not an expert
    - Be prepared to unlearn negative attitudes and stereotypes
2. People are knowledgeable
    - On subjects important to their livelihoods
    - Certain individuals have unique and valuable perspectives
3. Co-learning
    - Sharing of knowledge, experience and analysis
    - Combining local and professional knowledge for effective acceptable action
4. People make rational decisions
    - Based on information available
    - The appearance of irrational behavior means that a misunderstanding has occurred on the part of the appraiser
5. Optimal ignorance
    - There is a balance between the need for detailed information and the need for timely decision making.
6. Action-oriented
    - Data collected is based on the "information for action" philosophy.
    - The data should have an impact in a timely manner rather than collected simply for academic pursuits and publication

Participatory epidemiology (PE) is the use of participatory approaches and methods to improve our understanding of the patterns of diseases in populations. It is based on conventional epidemiological concepts and allows for the investigation of interactions between host, agent and environment but in a social context of disease transmission. It based on what is called "existing veterinary knowledge."

Evolution of Participatory Epidemiology

- Participatory approaches have been evolving since the 1960s in a variety of disciplines: adult education, social anthropology, rapid rural appraisal, participatory rural appraisal, community-based animal health
- Participatory epidemiology was first developed in pastoralist systems for rinderpest active surveillance (searching for disease outbreaks)
- It is increasingly being applied for a variety of emerging diseases in pastoralist, mixed farming and peri-urban systems around the world. Some examples include:
    - Rift Valley Fever (RVF) and East Coast Fever (ECF) in sub-Saharan Africa

- Foot and Mouth Disease (FMD) and Peste des Petits Ruminants (PPR) in Pakistan
- Highly pathogenic avian influenza (HPAI) in Egypt and Indonesia and several African countries

Applications of Participatory Epidemiology

PE may range from data collection (participation by information-giving or consultation) or may be closer to interactive participation where information is analysed with the community and a joint action plan is developed.

PE has a number of applications including:

1. Needs Assessments
    - Identify community priorities of and entry points for interventions
2. Participatory Epidemiology Research
    - Descriptive and Analytical Epidemiology
    - Disease modeling
    - Risk assessment
3. Passive Disease Surveillance
    - Community-based Disease Reporting
    - Information, Education and Communication
4. Active Disease Surveillance
    - Case finding (Participatory Disease Surveillance)
    - Demonstrating disease freedom
5. Impact Assessment
    - Evaluation of disease control interventions
6. Strategy and Policy Reform

Participatory Epidemiology Methods

Participatory epidemiology is based on communication and transfer of knowledge, using a variety of tools. These tools have been selected from a broader set of tools used in PRA and have been field tested for use with PE. Other tools may also be helpful but are beyond the scope of this course.

Tools and methods covered in this course include:

1. **Informal interviewing**: Semi-structured interviews, with key informants, focus-group discussions
2. **Ranking and scoring tools**: Simple ranking, pair-wise ranking, proportional piling, matrix scoring
3. **Visualisation tools**: Mapping, Venn diagrams, seasonal calendars, and timelines
4. **Direct observation**: transect walks, clinical and post-mortem exams.

They are complemented by:

1. **Secondary information sources** – to be obtained before you go to your study area.
2. **Laboratory diagnostics** – often rapid antigen tests are used in the field; if needed samples are taken and tested by a regional or national laboratory for confirmation.
3. **GPS** – data can be collected in the field to be used for disease modeling and reporting.

Handout: A Typology of Participation

Typology	Characteristics of each type
1. Passive participation	People participate by being told what is going to happen or has already happened. It is a unilateral announcement by an administration or project management without listening to people's responses. The information being shared belongs only to external professionals
2. Participation in information giving	People participate by answering questions posed by extractive researchers using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings, as the findings of the research are neither shared not checked for accuracy.
3. Participation by consultation	People participate by being consulted, and external people listen to views. These external professionals define both problems and solutions, and may modify these in the light of people's responses. 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	People participate by providing resources, for example labour, in return for food, cash or other material incentives. Much on-farm research falls in this category, as farmers provide the fields but are not involved in the experimentation or the process of learning. It is very common to see this called participation, yet people have no stake in prolonging activities when the incentives end.
5. Functional participation	People participate by forming groups to meet predetermined project objectives related to the project; which can involve the development or promotion of externally initiated social organisation, Such involvement does not tend to be at early stages of project cycles or planning, but rather after major decisions have been made. These institutions tend to be dependent on external initiators and facilitators, but may become self-dependent.
6. Interactive participation	People participate in joint analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and make use of systematic and structured learning processes. These groups take control over local decisions, and so people have a stake in maintaining structures or practices.

7. Self –mobilisation	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. Such self-initiated mobilisation and collective action may or may not challenge existing inequitable distributions of wealth and power.

From: Pretty, J.N., Guit, I., Thompson, J. and Scoones, I. (1995) A Trainer's Guide for Participatory Learning and Action, IIED 1995.

Handout: Introduction to Participatory Epidemiology

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    - The data should have an impact in a timely manner rather than collected simply for academic pursuits and publication

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3. **Visualisation tools**: Mapping, Venn diagrams, seasonal calendars, and timelines

4. **Direct observation**: transect walks, clinical and post-mortem exams.

They are complemented by:

1. **Secondary information sources** – to be obtained before you go to your study area.
2. **Laboratory diagnostics** – often rapid antigen tests are used in the field; if needed samples are taken and tested by a regional or national laboratory for confirmation.
3. **GPS** – data can be collected in the field to be used for disease modeling and reporting.

Chapter 4c: Community Veterinary Knowledge Session

Objectives

By the end of the session, the participants should be able to:

- Describe the concept of community veterinary knowledge (CVK)
- Describe the possible strengths and weaknesses of community knowledge systems

Session Planning

- Introduction: Community veterinary knowledge – 5 minutes
- Brainstorming: In your experience, what makes up community veterinary knowledge? – 25 minutes
- Group Practice: Examples of CVK – 30 minutes

Total time: 1 hour

Materials Needed

- Flip Chart Paper and markers
- Index cards

Support Materials on Training CD

- Presentation: Introduction to participatory epidemiology
- Handouts:
  - A typology of participation
  - Introduction to participatory epidemiology

Community veterinary knowledge is the information that communities have on veterinary matters. This type of knowledge has variable been called 'existing veterinary knowledge' and 'local knowledge' It is a important source of information from which PE investigators learn. Key informants, especially livestock keepers, are knowledgeable about animal diseases and their clinical presentations. They recognize diseases or syndromes and have local names for disease manifestations, especially if a disease has been present in the area for quite some time. For some diseases with clear clinical signs farmers are able to diagnose the disease and understand the pathology, vectors, reservoirs and other risk factors linked to the occurrence of disease. This understanding should not be underestimated despite a lack of formal education and possible illiteracy on the part of the livestock keepers. PE employs methods and tools that allow for learning from this valuable and unique source.

A new PE practitioner may be confused by the local names for diseases and risk factors used livestock keepers. These can be defined using a variety of methods that will be covered in this course including:

- Semi-structured interviews (SSI)
- Direct observation
- Matrix scoring for disease definitions

In describing and reporting PE information and learning, it is important to always use the original community knowledge terms. A major objective of most PE studies is to understand community knowledge terms as the community defines them (e.g. the picture they paint in words) and then translate these terms to conventional medical concepts that best fit. It is important to remember that the lack of a perfect fit between traditional and conventional medical concepts does not invalidate the usefulness of traditional knowledge. Communities sometimes split the same disease into multiple diseases based on the presentation. Thus, they may have different names for acute and chronic presentations of the same disease. They also may lump several diseases under one term that equivalent to a clinical syndrome rather than a disease with one specific etiology. Clarity and data integrity is best maintained by using the local term.

Brainstorming: Community Veterinary Knowledge

Ask the participants what they know about community veterinary knowledge. Where does it come from?

Possible answers might include:

- Exchange of information among livestock keepers
- Personal experience
- Ordinary/common knowledge
- Local indigenous knowledge
- Acts or practices passed down form generation to generation, for a purpose
- Passed from elders or grandparents
- Informal education

What other sources of information might livestock keepers have access to?

- Extension officers
- Training and formal education
- Media (TV, Radio)
- Outreach programs (posters, pamphlets)

Group Practice: Community Veterinary Knowledge

Ask the participants to think of a traditional livestock practice (animal health or animal management) and write it down on an index card.

Ask the participants to break up into small groups and discuss each practice in terms of its effectiveness at improving production or decreasing the disease burden in livestock.

For each practice, consider the following questions:

1. Is the practice rational?
2. How or why did this practice begin?
3. Does the practice make use of locally available materials?
4. Is the practice beneficial, harmful, or neutral?

Bring the groups back together and have each present the results of their group discussions. Build a table on a flip chart to categorize each practice as follows:

Beneficial	Neutral	Harmful

Chapter 4d: Review of Basic Epidemiologic Principles Session

Objectives

By the end of the session, the participants should be able to:

- Describe key concepts of epidemiology
- Calculate measures of central tendency, frequency and mortality rate.

Session Planning

- Interactive discussion: Concepts of epidemiology – 45 minutes
    a. Quantitative, semi-quantitative and qualitative methods as complimentary tools
    b. Measure of central tendency
    c. Ratios, proportions and rates
    d. Bias
- Sample problems in small groups (central tendency, frequency and mortality rates - 45 minutes

Total time: 1.5 hours

Materials Needed

- Flip Chart Paper and markers
- Simple calculators, paper and pen for each group

Support Materials on Training CD

- Handouts:
    - Basic Epidemiological Principals

Basic Epidemiologic Concepts

To give variety during the session, the trainer can have the participants sit in work groups and alternate between interactive presentation of concepts and problem solving for measures of central tendency, and frequency measures.

As discussed in Chapter 1, the "Session" sections in this manual should serve as guides to topics, terms and issues to be discussed with the participants. They are not meant for the facilitator to

display and read to the participants. Adult learners do not respond well to lectures and need to actively participate in the learning process. The facilitators need to be skilled at asking questions and engaging participants while sharing information. They should watch for signs of disengagement and insert discussions, exercises and energizers to keep the participants actively involved.

Epidemiology: The study of the distribution and determinants of disease in specified populations, and the application of the resulting information to the control of health problems.

The Epidemiologic Triad: In infectious disease epidemiology, disease occurs due to the interactions among the **host** (animal), the **agent** (e.g. viruses or bacteria) and the **environment** in which the host and the agent are present (Figure 1). The factors influencing the occurrence of disease are called **determinants** (see Table 1).

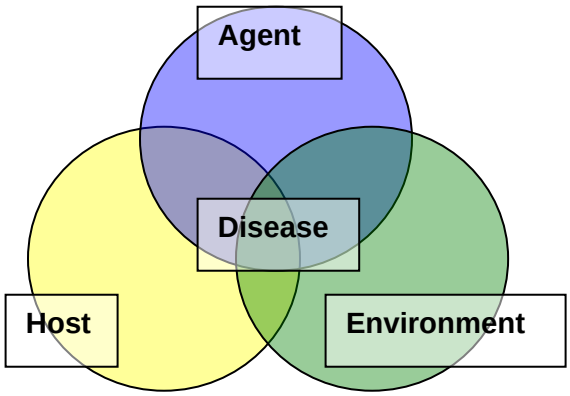

Figure 2: Interaction of host, agent and environment in the occurrence of disease.

Table 2: Disease determinants related to agent, host and environment

Determinants associated with the agent	Determinants associated with the host	Determinants associated with the environment
Virulence Pathogenicity	Genotype Age Sex Species and breed Immune status Stress	Location Climate Husbandry Social context

The Epidemiologic Approach: In simple terms, the epidemiologist

- **Counts** cases or health events, and describes them in terms of time, place, and host;
- **Divides** the number of cases by an appropriate denominator to calculate rates; and
- **Compares** these rates over time or for different groups or populations.

Case Definition: In order to count cases, the epidemiologist must first define what constitutes a case. A case definition is a set of standard criteria for classifying whether an animal has a particular disease, syndrome, or other health condition.

Descriptive Epidemiology: Identifies patterns among cases by describing "who, what, where, and when" the disease is occurring. Epidemiologists can use this information to develop hypotheses about the why/how (causes, risk factors, or modes of transmission).

Analytical Epidemiology: Allows for testing hypotheses about the causes, risk factors, or modes of transmission of disease by using a comparison group with different exposures or disease outcomes. Using analytical epidemiology, epidemiologists can quantify the association between exposures and outcomes and test hypotheses about causal relationships.

Types of Data: There are several types of data that can be collected during an epidemiological study each with relative strengths and weaknesses.

Quantitative data is a measure of "how much" of something and is expressed as a specific quantity with a unit. For example, a distance of 10 km is a quantitative measure.

Qualitative data is descriptive data. Instead of a specific quantity and unit of measure, in qualitative terms, a distance might be described as "far or near." Other examples of qualitative data are color and status (vaccinated or not vaccinated). Qualitative data is often needed to interpret quantitative accurately and the two forms of data complement each other.

Semi-quantitative data has a numeric value but the unit of measure may be comparative or scaled. Semi-quantitative data is often created from purely qualitative or quantitative information by using systems of ranking, prioritization and classification. For example, there are three points that are different distances away from a center location. These points might be ranked as 1 (the closest), 2 (the second closest), and 3 (the furthest). In analytical epidemiology, quantitative measurements are often converted to categories (near or far) and for analysis in statistic models.

Measures of Central Location: Quantitative and semi-quantitative data can be described by a central value that best represents the mid-point of data distribution. Common measures of central location are the mean, median, and mode and are also called the measure of central tendency.

Mean: also called the average; it is the most common measure of central tendency and is calculated by adding all the values in a group of measurements and dividing by the number of values in the group.

Median: the measure of central location that divides a set of data into two equal parts, above and below which lie an equal number of values. In other words, it is the middle value of a set of data that has been put into rank order.

Mode: the most frequently occurring value in a set of observations. It can be determined simply by tallying the number of times each value occurs.

Measures of Spread: The second method of describing data distribution is by summarizing the spread or dispersion of data points to show how far the data ranges from the measure of central location. Common measures of spread include **standard deviation, range** and **interquartile range**.

Standard Deviation: the measure of spread that is most commonly used with the mean. It is calculated by subtracting the mean from each observation and squaring the result to eliminate negative numbers. Then the average is calculated and the square root is taken to get back to the original units.

Range: the difference between its largest (maximum) value and the smallest (minimum) value in the data set and is usually reported as "from (the minimum) to (the maximum)." The range is the measure of spread commonly used with the median.

Interquartile Range: also commonly used to describe a data set with the median. It represents the central portion of the distribution, from the 25th percentile to the 75th percentile and thus includes approximately one half of the observations in the set, leaving one quarter of the observations on each side.

Measures of Frequency: Frequency measures compare one part of the distribution to another part of the distribution, or to the entire distribution. They can be used to compare health status of one population with another or the health status of a sub-population with the entire population. Common frequency measures are **ratios**, **proportions**, and **rates**.

Ratio: the relative size of two quantities, not necessarily related, calculated by dividing one quantity by the other. It is often expressed as the result "to one" or written as the result ":1."

Proportion: a ratio in which the numerator is included in the denominator; the ratio of a part to the whole, expressed as a "decimal fraction" (e.g., 0 2), a fraction (1/5), or a percentage (20%).

Rate: an expression of the relative frequency with which an event occurs among a defined population per unit of time, calculated as the number of events during a specified period divided by either person-time or the average (midinterval) population. Rates always involve time as a part of the denominator whereas proportions and ratios do not.

Commonly Used Measures of Frequency in Epidemiology:

Incidence: refers to the **proportion** of *new* cases of disease or injury in a population over a specified period of time.

Prevalence: is the **proportion** of persons in a population who have a particular disease or attribute at a specified point in time or over a specified period of time. Prevalence differs from incidence in that it refers to *all cases of disease present* during a period of time rather than only new cases.

Case Fatality Rate: is a misnomer as it is actually a proportion that does not involve time and not a rate. It is the **proportion** of animals with a particular condition that die from that condition. It is calculated by dividing the number of animals dead from a given disease by the number of animals sick with the disease within a population.

Bias: An estimate of a parameter is said to be biased to the extent that it systematically differs from the parameter that it is intended to represent. The amount of bias is the difference between the estimate and the 'true' value. Sources of bias are factors that introduce systematic error and may include using non-representative sample sets, problems of detection, or recall. In questionnaire surveys and semi-structured interviews, poorly designed questions that are leading or make assumptions can introduce bias. In epidemiological studies using laboratory tests, issues of sensitivity and specificity of tests, study design poorly adapted to context and issues of sampling procedures can be sources of bias.

Exercise: Measures of Central Tendency and Spread

The following exercises can be worked as a group or individually.

Use the following data set to answer the questions.

42, 50, 68, 44, 55, 29, 85, 43, 36, 69, 23, 40, 56, 34, 42

1. What is the mean?

   The mean is calculated by summing the values of the data set and dividing by the number of values.

   $$\text{Mean} = \frac{42+50+68+44+55+29+85+43+36+69+23+40+56+34+42}{15} = \frac{716}{15} = 47.7$$

   The mean is 47.7 or rounded to the nearest integer, 48.

2. What is the median?

   The median is determined by placing the values in rank order and selecting the middle value.

   23, 29, 34, 36, 40, 42, 42, 43, 44, 50, 55, 56, 68, 69, 85

   Middle position = (n + 1) / 2 = (15 +1) / 2 = 8
   n = number of values in the data set

   The median is the 8^{th} value in rank order and therefore is 43.

3. What is the range?

   The range is the difference between the smallest and largest value in the data set.

   The range is 23 to 85.

4. What is the interquartile range?

   The interquartile range represents the central portion of the distribution, from the 25th percentile to the 75th percentile and thus includes approximately one half of the observations in the set, leaving one quarter of the observations on each side.

   Position of lower quartile (25th percentile) = (n + 1) / 4 = (15 +1) / 4 = 4

The lower quartile is the 4th value in the data set and therefore is 36.

Position of upper quartile (75th percentile) = 3 (n + 1) / 4 = 3 (15 + 1) / 4 = 12

The upper quartile is the 12th value in the data set and therefore is 56.

The interquartile range is 36 to 56.

Exercise: Measures of Frequency

1. During an outbreak of disease at a poultry farm with of 100,000 chickens, the following number of cases occurred over a 4 week period:

Week 1: 3,000 chickens became ill
Week 2: 5,000 chickens became ill
Week 3: 6,000 chickens became ill
Week 4: 2,000 chickens became ill

Calculate the **incidence** of disease for each week

Week 1: 3,000/100,000 = 3%
Week 2: 5,000/97,000 = 5.1%
Week 3: 6,000/92,000 = 6.5%
Week 4: 2,000/86,000 = 2%

What is the **overall incidence** of disease over the 4 week period?

16,000/100,000 = 16%

2. Village A has 1000 sick chickens. In the last census, there were 100,000 chickens in Village A. Village B has 200 sick chickens. In the last census, there were 10,000 chickens in village B. Which village has a higher **prevalence** of disease?

Prevalence in Village A: 1000/100,000 = 1%
Prevalence in Village B: 200/10,000 = 2%

Village B has a higher prevalence of disease

3. There are 200 cattle in a herd that are diagnosed with Disease Y. Out of these cases, 20 of these cattle die. What is the **case fatality rate**?

$$\frac{\text{20 cows dead as a result of Disease Y}}{\text{200 cows sick from Disease Y}} = 10\%$$

Handout - Basic Epidemiologic Principles

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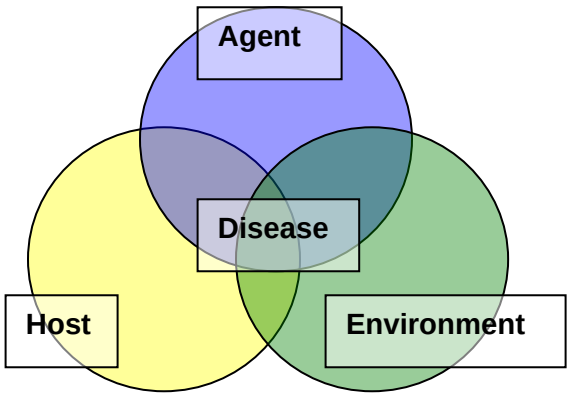

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Frequently Used Measures of Frequency in Epidemiology

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Chapter 4e: PE Tools - Semi-Structured Interview and Checklist

Objectives

By the end of the session, the participants should be able to:

- Describe the elements of a semi-structured interview
- Write a semi-structured interview checklist
- Describe the difference between open, leading, and probing questions
- Understand how to interpret behavior and attitude
- Demonstrate the semi-structured interview technique

Session Planning

- Presentation: Elements of a Semi-structured Interview – 15 minutes
- Brainstorming: Good Interviewing – 15 minutes
- Exercise: Categorize open and leading questions – 15 minutes
- Exercise: Interpreting behavior and attitude – 15 minutes
- Group practice: Investigate a potential disease outbreak – 1 hour

Total time: 2 hours

Materials Needed

- Flip Chart Paper and markers
- Index cards
- Computer and Projector (optional)

Support Materials on Training CD

- Presentation on Semi-structured Interview
- Video of Example Interview
- Exercise: Interpreting Behavior and Attitude
- Participant Handout: Summary guidelines for semi-structured interviews

Elements of a Semi-Structured Interview (SSI)

Anyone can interview but not everyone can conduct a good interview.

Interviewing is a specialized skill that improves with practice. Although just about anyone can collect useful information through an interview, the amount and reliability of information obtained can be greatly improved with experience.

"At the heart of all good participatory research and development lies sensitive interviewing. Without it, no matter what other methods you use, the discussion will yield poor information and limited understanding. It may create feelings of suspicion, fear or even hostility in the local people.

Semi-structured interviewing can be defined as: guided conversation in which only the topics are predetermined and new questions or insights arise as a result of the discussion and visualized analyses." (Pretty *et al*, 1995)

The interview method is informal but has a defined objective.

In this presentation, the following elements of an SSI will be covered:

1. Checklist
2. Place and time
3. Introductions
4. Questions
5. Probing
6. Observing Behavior
7. Data Recording

Checklist

In participatory appraisal, an interview questionnaire is not used. Instead, the study team prepares a checklist of important points and exercises to be covered. This allows the interview to be flexible and permits the respondents to express their thoughts in their own words within their own conceptual frameworks.

An example of a checklist for a participatory study to identify and prioritize animal health problems in a community is presented in Box 1. The checklist provides overall direction and ensures that no major points are missed in the interview. The checklist is flexible, allowing the respondents to discuss issues of special interest to them, and the appraisal team to investigate specific themes raised by the respondents. Not all items on a checklist need to be covered with every group of participants; this is a matter of judgement.

Box 1: Sample checklist for identifying and prioritizing animal health issues

1. Introduce the appraisal team
2. Identify the respondents
3. Livestock species kept
4. Husbandry systems
5. Grazing locations (mapping exercise)
6. Identify and describe three diseases for each major species
7. Proportional piling exercises on disease importance
8. Direct observations (transects and clinical examinations)

Figure 1: Active participation where people freely exchange their views in a relaxed manner, listen and reflect on the content of the discussion is the goal of a good interview.

Place and Time

The place and time when the interviews are conducted influence their success. Unfortunately, the study team does not always have control over these conditions, but every effort should be made to arrange a quiet and comfortable location. Ideally, the interview team and respondents should feel relaxed and on an equal footing with each other. Traditional community meeting sites make good group interview sites. Community and training centres make acceptable interview sites but official offices or the appearance of an official enquiry should be avoided.

With pastoral societies, dawn and dusk are often the best times to find cattle owners at their camps, but may not be the best times to interview them. For sedentary smallholder farmers, they may be busy tending to their crops in the mornings so it may be better to carry out interviews in the afternoon. Always ask if it is a convenient time and if not, when the meeting could be held. The interview should be planned to last about an hour to avoid loss of interest. If the informants lose interest, the quality of information being shared will decline. Learn to watch for signs of fatigue and boredom. Fidgeting and side conversations are a sign that either the interview needs to be enlivened by a shift to topics of greater interest to the respondents or that it is time to wrap up by asking any key questions that may remain.

Introductions

The first step in any interview is introductions. The members of the study team should introduce themselves and ask the participants to introduce themselves. Your introduction should be accurate but should not bias the response of the participants. For instance, if you place emphasis on a particular subject such as poultry or contagious bovine pleuropneumonia (CBPP) in your introduction, the respondents will frequently put undue emphasis on these topics in their replies. Normally, the study teams should record the names and community memberships of the respondents. At this point, the interviewers should also try to identify if the respondents are suitable participants for the appraisal at hand.

The appraisal team must be careful not to raise community expectations concerning future projects or services. The introduction is a good opportunity to diffuse some of these expectations by stating that the appraisal is only a study and the members of the appraisal team are not the decision-makers regarding future programs. Interviewers should state that they have not come with any drugs or medicines and that the purpose of the interviews is simply to share information. Invite informants to leave at any time if they wish.

Questions

It is essential to the reliability of the information collected that questions are open-ended rather than leading questions that restrict or direct the respondent to a particular response or type of response. In an animal health appraisal, it is often best to begin with a question such as ***'What animal health problems are you experiencing?'***

A good question does not make assumptions. For example, if the respondents have described a current disease problem that is consistent with sheep pox and you wish to know when previous outbreaks occurred, you might wish to ask: ***'When was the last time this disease occurred?'*** However, it would be better to ask: ***'Have you seen this disease before?'***

The first question assumes that the disease has occurred before and communicates the assumption to the respondents, who may state a year for the sake of being polite or out of fear of appearing uninformed. The second question allows the respondents greater freedom to state what they confidently know.

Questions should be ordered so that the interview progresses from general themes to specific ones. As much as possible, the respondents should determine the direction of the interview. As a result, most questions cannot be pre-planned. They must be designed on the spot in light of the information already presented and investigators must be able to think on their feet. The fact that most questions cannot be pre-planned does not mean that a limited number of ***key questions*** cannot be worked into the interview. For example, the appraisal team may have a special interest in unraveling the local epidemiology of CBPP and wish to ask in every interview about the last occurrence of CBPP. This can be done, but very careful attention must be paid to when the question is asked in the flow of the interview to avoid leading the discussion. If the disease is endemic, the participants will probably raise the subject of CBPP and the appraisal team can safely ask their standard question. If the participants do not introduce the subject of CBPP, the CBPP question can be asked at the end of the interview. However, the appraisal team should note that the community did not introduce the subject and that this probably reflects that CBPP is not a local priority.

Quantitative questions on subjects such as mortality rates and herd size do not receive very accurate responses. It is usually best to avoid such types of questions. In the authors' experience, herders do know exactly how many animals they own; it is their main form of wealth. However, as in most societies, it is impolite or brings bad luck to directly enquire about wealth in quantitative terms. If people do respond, poor farmers may exaggerate and rich ones may depreciate their holdings. If more specific information on herd or flock size is desired, McCauley et al (1983) collected accurate data on herd sizes to calculate mortality rates by triangulating three pieces of information:

- Owner information
- Direct observation of the herd
- Information from neighbours about the subject's livestock holdings

Probing

In participatory appraisal, the term probing means to ask detailed questions on a specific subject raised by the respondents. Probing is both a data gathering and data quality control technique. Probing can be used to verify the internal consistency of information or simply to gather more detailed information on a particular subject. In the case of PE, probing is often used to obtain a more detailed description of a particular disease entity volunteered by a respondent. For example, respondents might describe a disease that causes sudden death in livestock without *rigor mortis*. The appraisal team could enquire if the disease can affect humans and if so what does the disease look like in humans. A positive response with a characteristic description of anthrax abscesses will confirm this description as anthrax.

Verifying internal consistency of information is an important means of data quality control in PA. Probing helps to establish the plausibility of statements made by the participants through gathering more detailed information and background of the issue. This does not mean that 'trick questions' or attempts to lead the participants into self-contradiction should be made. Participatory techniques are founded on enlightened respect for individual opinions and observations. One respectfully evaluates the quality and merit of all statements from all individuals.

Observing Behavior

During interviews, it is very important to observe the informants as well as listen to them. Are the respondents relaxed and confident? Are they making eye contact? What types of body language are being expressed? Are some topics sensitive? Is everyone participating? Who is not participating? Are some people comfortable and others not? What are the differences in appearance between those participating and those who are not? Is gender, wealth or age the issue (don't ask, observe)? Follow-up interviews can be arranged with "non-participating" informants in groupings where they may feel more comfortable.

Group interviews may be a challenge if one or more individuals are dominating the respondents. Others may want to contribute but are intimidated because of the confidence with which the individual is speaking. Several methods for controlling dominant speakers exist. These include:

- Asking each person to answer the question individually

- Statements such as: “We’ve been hearing a lot from ____. Does anyone else have a different opinion?”
- Encouraging dissenters within the group by encouraging more than one response for each question

In general, livestock owners enjoy talking about their livestock. PE is about letting people share their knowledge and learning from them. The investigator should listen, be patient and open-minded.

Data Recording

Semi-structured interviews function best when a team of individuals work together. The appraisal team may be made of a facilitator, translator (if necessary), and data recorder. The data recorder usually sits slightly away from the group and records the discussion and observes group dynamics. They may note who within the group is contributing to which questions and who is keeping quiet.

If the facilitator is acting alone, he/she should record only the main points during the interview. Full notes can be made at the end to prevent interruptions in the interview process.

Regardless of whether the facilitator is working with a team or acting alone, data/notes should be reviewed immediately following the interview and overlooked details should be added.

Brainstorming: Good Interviewing

Ask the participants to brainstorm answers to the following questions and write their answers on flip chart paper. Some suggestions are given.

What makes a good interview?

- two-way dialogue
- comfortable atmosphere
- simple
- flexible

What is the objective of a good interview?

- sharing information
- obtaining information by participation
- co-learning

What are the characteristics of a good interviewer?

- Good communicator (uses simple language)
- confident
- good listener
- informal
- diplomatic
- interactive
- positive behavior and attitude

What are the barriers to good interviewing?

- 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
- Sensitive questions
- Irrelevant questions
- Repetitiveness
- Asking questions with obvious answers

Exercise: Categorize Open and Leading Questions

During the brainstorming some trainees may 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 categorize questions and rephrase leading questions so that they are more open.

Ask the participants to categorize the following questions as open or leading:

1. *Do you ever visit the veterinary clinic?*
2. *Why do you prefer to keep sheep rather than goats?*
3. *How many cattle do you have?*
4. *It's interesting what you say about anthrax – can you tell me more about it?*
5. *How many times have you vaccinated your chickens in the last few years?*
6. *Do your children play a role in caring for livestock?*
7. *What are the benefits of raising cattle?*
8. *What treatment do you provide for your goats when they are sick with respiratory disease?*
9. *Do you believe that traders carry poultry diseases into the village?*
10. *Do more of your animals get sick during the rainy season?*

During the discussion, when questions are classified by the group as leading, ask the participants to rephrase the questions to make them more open.

Exercise: Interpreting Behavior and Attitude

Distribute a piece of paper to each participant with a behavior, attitude or emotion written on it e.g. proud, angry, bored, happy, sad, impatient, arrogant, relaxed, tired, afraid, surprised. Ask the participants to act out the behavior and have the other participants guess what it is.

Discuss with the participants why interpreting behavior during semi-structured interviews is important for PE.

For example:
Interpret relationships between participants and when participants might have something to say but are intimidated
It can be a means of assessing professional, social, and cultural biases.
Attitude of the interviewer can impact the responses from the participants.
It can be used as a way of knowing when the interview should end.

Alternative:

An alternative to this exercise is to show the power point presentation entitled "Interpreting Behavior and Attitude" which contains cartoons and photos showing interview scenarios. Ask the participants to interpret what is going on in the cartoon. What is the non verbal communication taking place? Is this good interviewing? What is good? What is not so good? What could be done differently?

Figure 2: Participants in an interview in South Sudan. Describe their expressions. What does their expressions communicate?

Group practice: Investigate a Potential Disease Outbreak

Divide the participants into groups of 4-5 people.

Instruct them to develop a checklist for a semi-structured interview to investigate a rumor of a foot and mouth disease outbreak in their area.

Ask 2-3 people in each group to play the role of livestock keepers and the other 2 to act as interviewers. If time allows, participants should swap roles.

Bring the group back together and give the participants an opportunity to discuss what they learned during the group practice. Ask for volunteers to present their interview checklist and, if time allows, conduct a role play. Some questions/topics for discussion could include:

What was the easiest and most difficult part of the interview process?

Were there any surprises?

What questions did the participants use to start the discussion?

What were some of the probing questions that came up during the interview?

Discuss what worked well, what did not work well, and what could be improved.

Handout: Summary guidelines for semi-structured interviews

1. **Prepare yourself:** Define the topic you want to investigate, write an interview checklist, and determine who it is you would like to interview. Discuss the purpose of your visit with the local authorities. If possible, bring an assistant along as a note-taker and a translator, if necessary.

2. **Choose a convenient time and a comfortable setting**: Interviews should be held in a quiet and comfortable location at a convenient time for the participants. Traditional community meeting sites make good group interview sites. Official offices should be avoided.

3. **Introduce yourself, your team 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. Be careful not to raise expectations regarding follow-up or distribution of vaccines or medicines.

4. **Watch your body language throughout:** Be friendly, informal, and respectful.

5. **Start with general questions/comments:** This will put people at ease. Ask only one question at a time.

6. **Mix questions with general discussion:** By introducing variety, you will keep up the interest of your informants. Casual dialogue will ensure good communication.

7. **Use diagrams, symbols and other drawings:** These will help in keeping people interested and ensuring everybody participates and understands.

8. **Use simple language:** Avoid "scientific" words. Avoid leading questions, long or complicated questions, and questions which can be answered with simple "yes" or "no".

9. **Probe:** If an interesting point comes up, try to discover more about it. Six small words (why, how, who, what, when, where?) will help you to probe: keep them in mind throughout.

10. **Observe:** Watch to make sure that everybody participates (especially women) and that 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 and 60 minutes is ideal.

11. **When the interview is over:** thank your informants and give them an opportunity to ask their own questions. This is polite and will also provide valuable information.

12. **Make full notes after the interview:** Writing down only the main points during the interview will prevent interruptions in the interview flow. Even if a note taker is used, the notes should be reviewed by the entire interview team to fill in any gaps that may have been missed.

Chapter 4f: PE Tools - Simple and Pair-wise Ranking

Objectives

By the end of the session, the participants should be able to:

- Understand and demonstrate the use of simple ranking
- Understand and demonstrate the use of pair-wise ranking

Session Planning

- Presentation - Simple Ranking – 15 minutes
- Demonstration - Simple Ranking – 15 minutes
- Group practice – Simple Ranking – 15 minutes
- Presentation – Pair-wise Ranking – 15 minutes
- Demonstration - Pair-wise Ranking – 15 minutes
- Group practice – Pair-wise Ranking – 30 minutes

Total time: 1 hour 45 minutes

Materials Needed

- Flip Chart Paper and markers
- Index Cards
- Computer and Projector (optional)

Support Materials on Training CD

- Presentation on Simple Ranking
- Presentation on Pair-wise Ranking
- Video on using ranking tools in an SSI
- Participant Handout: Simple and Pair-wise Ranking

A Note about PE Tools: Ranking and Scoring

Numerous tools have been developed for use by the PE investigator to assist with communication. As mentioned in the introduction, these tools can be classified into four groups:

Tools and methods covered in this course include:

5. **Informal interviewing**: Semi-structured interviews, with key informants, focus-group discussions
6. **Ranking and scoring tools**: Simple ranking, pair-wise ranking, proportional piling, matrix scoring
7. **Visualisation tools**: Mapping, Venn diagrams, seasonal calendars, and timelines
8. **Direct observation**: transect walks, clinical and post-mortem exams.

Different PE tools can be used to investigate the same issues or diseases. Although the methods are intended primarily to explore different aspects of the issue being investigated, there will be some overlap in the information generated. This overlap is often most evident from answers given to probing questions asked after each tool is used and is important for triangulation of disease information.

This module will cover two ranking and scoring tools: simple ranking and pair-wise ranking.

Important advantages of ranking and scoring techniques are:

- they do not require herd sizes to be estimated because it only uses relative scores. Therefore, sensitive questions such as “how many cattle do you own?” are not necessary
- semi-quantitative data is collected that can be later evaluated analytically. Comparisons can be made between different regions and different categories of informants.
- data collected can be used to triangulate information from the SSI
- like other PE tools, the method does not require literacy on the part of the informants

The investigator must be sensitive to the education and literacy status of the informants he/she is interviewing. If the informants are illiterate, it is important to substitute pictures, symbols, or objects to represent words such as livestock species, diseases, etc. when using PE tools. Often times, the informants will not tell you that they cannot read so it up to the best judgement of the investigator to interpret when this is necessary and helpful. When dealing with educated informants, they may be insulted if the investigator is too simplistic in his/her explanation of how to use the tools, and is using symbols instead of words. The investigator must be sensitive to this as well to keep the informants from losing interest in the exercise. In some cases, there may be a mixed audience. Pictures, objects, or words can be used in this case, but the investigator should repeat many times out loud what each represents so that all informants are fully aware. This should be done in any scenario when using ranking and scoring exercises to be sure that there is clear communication.

Presentation: Simple Ranking

In simple ranking the informants are requested to order a list of items based on a defined criteria. Simple ranking is a fast and easy tool that allows many people to participate. It is an easy way to make sure there is consensus among the group being interviewed and gives the investigator the opportunity to probe more deeply into the meaning behind the ranking.

Simple ranking is a quick way of gathering data to help the researcher to understand issues from the respondents' point of view. It can be used for any number of topics from species and diseases of importance to types of housing, occupations, sources of income, etc. It is usually best to conduct this exercise with small groups, although it can be done with individuals or quite large groups. They should discuss the ranking and arrive at their decision by consensus. Listening to the discussion and probing the results of the ranking provides as much or more information than the final ranking.

Method for simple ranking

It is often best to think of PE tools in terms of steps the first few times you use them.

1. Have your simple ranking criteria clear in your own mind and write it down in your notebook. For example: *'Rank cattle disease problems in order of impact on household livelihood'.*
2. To develop the list of items for ranking, begin with an open-ended question: For example: *'What are some common disease problems that affect your cattle?'*
3. Probe the responses. Ask for descriptions of the diseases and clarify details.
4. Explain that you want to carry out an exercise to better understand what you are learning about their livestock disease problems. Have pictures, symbols or objects to represent each disease or write the name of each disease on a card. Place the pictures, symbols, objects or cards on a flat surface or on the ground where everyone can see them and remind the participants what each represents.
5. Ask the group to rank the diseases based on your defined criteria. For example, ask them to rank the diseases in order of the level of impact they have on household livelihood.
6. Give the informants time to discuss and rank the cards by consensus. Encourage them to make adjustments if they want to. When they appear to have finished, ask them if they all agree on the result.
7. Leave the cards in place. Summarize and crosscheck their ranking. For example: *'You have put CBPP first, followed by FMD, then HS, then trypanosomiasis. Is this correct?'*
8. Probe the results. For example: Why did they put this disease first, why this one last, why is this one above this one? etc.
9. Record the ranking question, the results and notes of any discussion during the ranking or during probing.

Demonstration: Simple Ranking

Informants are asked to name livestock that are kept in their village. The livestock species are written on cards. Then the informants are asked to organize the cards in order of population in the village.

Livestock species by population

1. chickens
2. goats
3. cattle
4. sheep
5. donkeys

Once the informants have ranked the cards, the interviewer asks if they all agree and then asks probing questions to find out why they have ranked chickens first, why donkeys last, etc.

The criteria being used for ranking should be clear to both the investigator and the informants and carefully recorded along with the results. If the question is changed slightly, the results might be much different. For example, if the informants are asked to rank the livestock species according to importance to household livelihoods, the result might be:

Livestock species by importance to household livelihood

1. cattle
2. goats
3. sheep
4. chickens
5. donkeys

Informants could also be asked to rank common livestock diseases based on importance, mortality or frequency of occurrence

Common livestock diseases based on importance to household income e.g. cattle diseases

1. CBPP
2. Haemorrhagic septicaemia (HS)
3. Foot and mouth disease (FMD)
4. Trypanosomiasis
5. Anthrax

Group Practice: Simple Ranking

Ask the participants to break into groups of 3-4 people. Ask them to write or draw five types of fruit on index cards. Each person in the group should be the investigator at least once and ask the other group members to rank the fruits based on one of the following criteria:

1. Price
2. Taste
3. Availability
4. Nutritional value

Keep the results from this exercise to be used in the data analysis module

Presentation: Pair-wise Ranking

Pair-wise ranking or comparison is a slightly more complex method than simple ranking. In pair-wise ranking, each item is compared individually with all the other items one-by-one. This tool can be used to understand the relative importance of different species or diseases and, through probing, to understand the benefits of different species or the impact of different diseases. It can be useful when there are disagreements among informants during a simple ranking exercise or if the scores given to different items using a proportional piling exercise are very similar so as not to be able to distinguish whether one is more important than the next. Pair-wise ranking is more complex and takes more time than other PE tools so should be primarily used with key informants such as district veterinary officers as a means of soliciting expert opinions.

In pair-wise ranking, the interviewer names two items from the list and asks the participants to name the more important. This is repeated for every possible combination in the list. This is approach is considered more reliable than simple ranking as it assists the participants to consider every possible relationship. It is especially useful if informants cannot reach a consensus using simple ranking or if they score two items nearly the same when using proportional piling. After the respondents rank each pair, they are asked why they made the choice they did. The criteria they specify are called indicators.

Method for pair-wise ranking

1. Have a pair-wise ranking criteria clear in your own mind and write it down in your notebook. For example: *'Compare the importance of different cattle disease problems'*.
2. To develop the list of items for ranking, begin with an open-ended question: For example: *'What are some common disease problems that affect your cattle?'*
3. Probe the responses. Ask for descriptions of the diseases and clarify details.
4. Explain that you want to carry out an exercise to better understand what you are learning about their cattle disease problems. Have pictures, symbols or objects to represent each disease or write the name of each disease on a card. Place the pictures, symbols, objects or cards on a flat surface or on the ground where everyone can see them and remind the participants what each represents.
5. Select one disease card and a second one. Ask: *'Which disease is more important? This one or this one?'* Once they have chosen, crosscheck the answer and then probe: *'Do you all agree? Why is this disease more important than this one?'*
6. Repeat the question comparing the same disease with each of the other diseases one-by-one, crosscheck and probe. Then select the second disease and compare it with all the remaining diseases one-by-one, and so on until all the diseases have been compared with all the other diseases.
7. The result of each comparison is recorded (see example in Table 1) as well as the details of any discussions generated by crosschecking and probing.
8. Count the number of times each disease was selected and record it at the bottom of the corresponding column. The disease that was selected the most often is ranked highest.

Demonstration: Pair-wise Ranking

Use the following example to demonstrate the methods to the participants:

Table 1: Example of pair-wise ranking on importance of common cattle diseases

	ECF	FMD	Anaplamosis	Heartwater	Worms	Tryps	CBPP
ECF							
FMD	FMD						
Anaplasmosis	ECF	FMD					
Heartwater	Heartwater	FMD	Heartwater				
Worms	ECF	FMD	Anaplasmosis	Heartwater			
Tryps	ECF	FMD	Anaplasmosis	Heartwater	Tryps		
CBPP	CBPP	CBPP	CBPP	CBPP	CBPP	CBPP	
Score	**3**	**5**	**2**	**4**	**0**	**1**	**6**
Rank	**4**	**2**	**5**	**3**	**7**	**6**	**1**

In this example, contagious bovine pleuro-pneumonia (CBPP) ranks first with a score of 6, foot and mouth disease (FMD) ranks second with 5, heartwater ranks third with 4, east coast fever (ECF) fourth with 3, anaplasmosis ranks fifth with 2, trypanosomiasis (tryps) ranks sixth with 1, and worms rank last with 0.

Probing questions during the exercise help to understand the ranking. The following questions may be asked during the demonstration:

- Why is ECF more important than anaplasmosis?
- Why is CBPP the most important?
- Why are worms the least important?
- What criteria are you using to say a disease is more important?

Group Practice: Pair-wise Ranking

Ask the participants to break into the same groups of 3-4 people. One person will be nominated as the investigator and conduct pair-wise ranking for one of the following questions:

1. What is the most common breakfast food consumed in the homes of the informants? (First, ask the participants to list the foods consumed for breakfast in their homes and choose the five most important)
2. What is the most important means of transportation in the area?
3. What are the participants' favorite holidays?

Have each investigator present the results of their pair-wise ranking exercise.

Ask the participants what they think of using ranking two tools during a semi-structured interview. Under which circumstances could these tools be used with farmers? What kinds of questions can be investigated?

Handout: Simple and Pair-wise Ranking

Simple Ranking

In simple ranking the informants are requested to order a list of items based on a defined criteria. Simple ranking is a fast and easy tool that allows many people to participate. It is an easy way to make sure there is consensus among the group being interviewed and gives the investigator the opportunity to probe more deeply into the meaning behind the ranking.

Method for simple ranking

1. Have your simple ranking criteria clear in your own mind and write it down in your notebook. For example: *'Rank cattle disease problems in order of impact on household livelihood'.*
2. To develop the list of items for ranking, begin with an open-ended question: For example: *'What are some common disease problems that affect your cattle?'*
3. Probe the responses. Ask for descriptions of the diseases and clarify details.
4. Explain that you want to carry out an exercise to better understand what you are learning about their livestock disease problems. Have pictures, symbols or objects to represent each disease or write the name of each disease on a card. Place the pictures, symbols, objects or cards on a flat surface or on the ground where everyone can see them and remind the participants what each represents.
5. Ask the group to rank the diseases based on your defined criteria. For example, ask them to rank the diseases in order of the level of impact they have on household livelihood.
6. Give the informants time to discuss and rank the cards by consensus. Encourage them to make adjustments if they want to. When they appear to have finished, ask them if they all agree on the result.
7. Leave the cards in place. Summarize and crosscheck their ranking. For example: *'You have put CBPP first, followed by FMD, then HS, then trypanosomiasis. Is this correct?'*
8. Probe the results. For example: Why did they put this disease first, why this one last, why is this one above this one? etc.
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Pair-wise Ranking

Pair-wise ranking or comparison is a slightly more complex method than simple ranking. In pair-wise ranking, each item is compared individually with all the other items one-by-one. This tool can be used to understand the relative importance of different species or diseases and, through probing, to understand the benefits of different species or the impact of different diseases. It can be useful when there are disagreements among informants during a simple ranking exercise or if the scores given to different items using a proportional piling exercise are very similar so as not to be able to distinguish whether one is more important than the next. Pair-wise ranking is more complex and takes more time than other PE tools so should be primarily used with key informants such as district veterinary officers as a means of soliciting expert opinions.

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the respondents rank each pair, they are asked why they made the choice they did. The criteria they specify are called indicators.

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5. Select one disease card and a second one. Ask: *'Which disease is more important? This one or this one?'* Once they have chosen, crosscheck the answer and then probe: *'Do you all agree? Why is this disease more important than this one?'*
6. Repeat the question comparing the same disease with each of the other diseases one-by-one, crosscheck and probe. Then select the second disease and compare it with all the remaining diseases one-by-one, and so on until all the diseases have been compared with all the other diseases.
7. The result of each comparison is recorded (see example in Table 1) as well as the details of any discussions generated by crosschecking and probing.
8. Count the number of times each disease was selected and record it at the bottom of the corresponding column. The disease that was selected the most often is ranked highest.

Table 1: Example of pair-wise ranking on importance of common cattle diseases

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FMD	FMD						
Anaplasmosis	ECF	FMD					
Heartwater	Heartwater	FMD	Heartwater				
Worms	ECF	FMD	Anaplasmosis	Heartwater			
Tryps	ECF	FMD	Anaplasmosis	Heartwater	Tryps		
CBPP	CBPP	CBPP	CBPP	CBPP	CBPP	CBPP	
Score	**3**	**5**	**2**	**4**	**0**	**1**	**6**
Rank	**4**	**2**	**5**	**3**	**7**	**6**	**1**

In this example, contagious bovine pleuro-pneumonia (CBPP) ranks first with a score of 6, foot and mouth disease (FMD) ranks second with 5, heartwater ranks third with 4, east coast fever (ECF) fourth with 3, anaplasmosis ranks fifth with 2, trypanosomiasis (tryps) ranks sixth with 1, and worms rank last with 0.

Probing questions during the exercise help to understand the ranking. The following questions may be asked during the demonstration:

- Why is ECF more important than anaplasmosis?
- Why is CBPP the most important?
- Why are worms the least important?
- What criteria are you using to say a disease is more important?

Chapter 4g: PE Tools - Proportional Piling and PPMM

Objectives

By the end of the session, the participants should be able to:

- Understand and demonstrate the use of proportional piling
- Understand and demonstrate the use of proportional piling for morbidity and mortality

Session Planning

- Presentation – Proportional Piling – 15 minutes
- Demonstration – Proportional Piling – 15 minutes
- Exercise – Proportional Piling – 15 minutes
- Group practice – Proportional Piling – 30 minutes
- Presentation – Proportional Piling for Morbidity and Mortality – 15 minutes
- Demonstration of proportional piling for morbidity and mortality – 15 minutes
- Group practice – Proportional Piling for Morbidity and Mortality – 30 minutes

Total time: 2 hours 15 minutes

Materials Needed

- Flip Chart Paper and markers
- Index Cards
- Counters
- Computer and Projector (optional)

Support Materials on Training CD

- Presentation on Proportional Piling
- Presentation on Proportional Piling for Morbidity and Mortality
- Handouts:
  - Proportional Piling
  - Proportional Piling for Morbidity and Mortality

This module will cover two ranking and scoring tools: proportional piling (in general) and proportional piling for morbidity and mortality.

Presentation: Proportional Piling

Proportional piling is a technique that allows farmers to give relative scores to a number of different items or categories according to one criterion. It can be done with an individual or by reaching consensus with a small group. The scoring is done by asking the farmers to divide 100 counters (beans, stones or similar items that are familiar to the community and locally available) into different piles that represent the categories. For example, the farmers could give scores to a set of disease problems (the categories) according to how important the diseases were to their livelihood (the parameter). Alternatively, the farmers could be asked to score the diseases according to how commonly they occur. Semi-quantitative data is collected by recording the number of counters in each category. This data can later be evaluated analytically.

Common uses of proportional piling during a semi-structured interview include the demonstration of:

1. Relative importance or population of livestock species in the village
2. Relative quantities of feed types provided to livestock
3. Sources of farm inputs (day old chicks, calves, feed, medicines, etc)
4. Relative incidence of diseases in the village
5. Relative importance of diseases to the livelihoods of farmers

Method of proportional piling

1. Have your proportional piling question clear in your own mind and write it down in your notebook.
2. To develop the list of items or categories for scoring, begin with an open-ended question. For example: *'What are the disease problems affecting your cattle?'*
3. Probe the responses; ask for descriptions and clarifications.
4. Explain that you want to carry out an exercise to better understand what you are learning about their livestock disease problems. Draw circles on the ground, one circle for each disease mentioned, and place a drawing or card next to each circle that illustrates the disease. Circles can also be made from construction paper or drawn on flipchart paper.
5. Place one hundred counters in a pile and ask the respondents to divide them according to a particular characteristic or parameter. Respondents do not need to count the counters but should divide them visually. For example, instruct the informants to divide the counters to represent the impact each disease has on their livelihood.
6. Make sure that they recognize each category by its drawing or name. Point at each category and say out loud what the drawing or name represents.
7. Give the informants time to discuss and divide the piles by consensus. When they appear to be finished, summarize and crosscheck the result. For example: *'You have scored this disease highest, followed by this one, then this one and this one is scored lowest. Do you all agree with these results?'*
8. Count the counters, but leave them in place so that the result can be discussed.
9. Probe the results. Why did they make the choices that they did?

It is usually best to conduct this exercise with small groups, although it can be used with larger groups or with individuals. They should discuss the division of the counters and arrive at their

decision by consensus. Listening to the discussion and probing the results of the piling provides as much or more information than the final score. This information tells you why the respondents gave the scores that they did and tells a lot about how they view the problems.

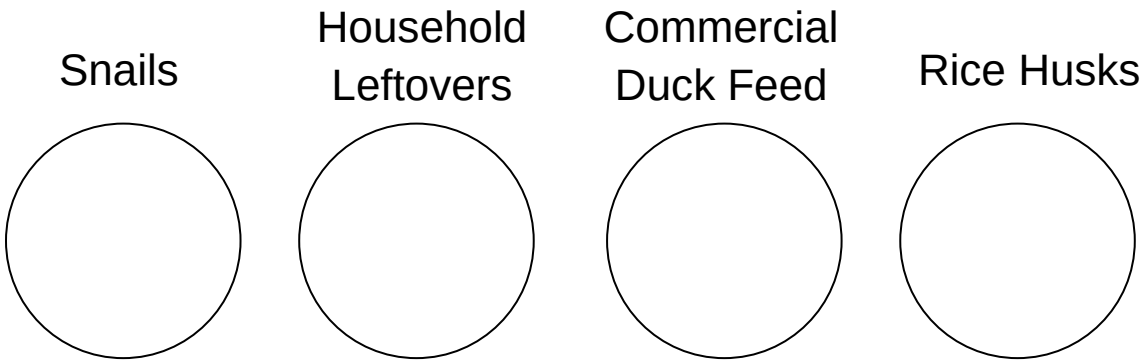
Demonstration: Proportional Piling

The objective of using this activity is to find out which types of feed are provided to duck flocks in the study area, and the relative proportions of each type that are provided.

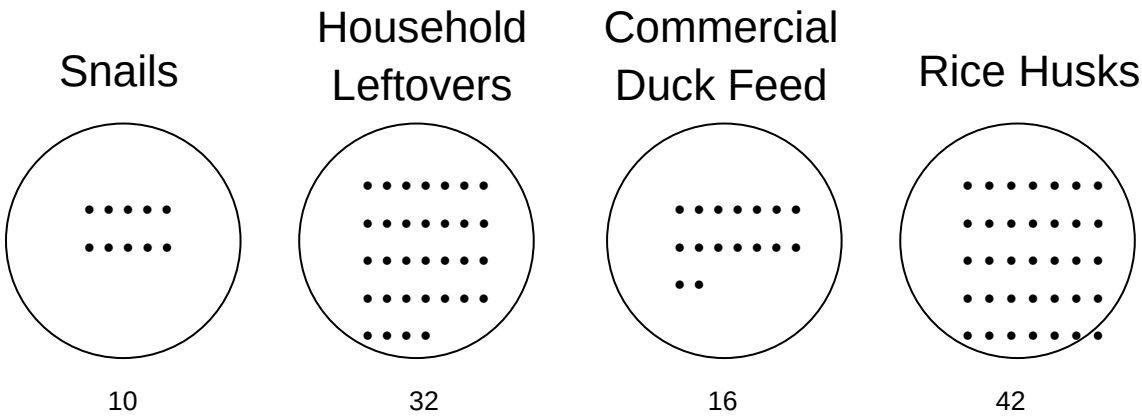
To develop a list of feed types, ask the duck farmers: What are the common feeds provided to ducks in the area? You may already have this information from earlier in the interview.

The farmers give the following responses: snails, household leftovers, commercial duck feed, and rice husks.

Draw four circles on flipchart paper, or use four index cards, and label them with images or words representing the farmers' responses.



Provide the farmers with 100 counters and ask them to distribute them relative to the amount of each type of feed that they provide to their ducks during a one week period. The farmers agree on the following proportions:



What questions might be asked of the farmers in order to get more information from this exercise?

Examples:
Why do rice husks make up the largest proportion of the ducks' diet?
Why are snails provided for the ducks and where are they obtained?
Where do you purchase commercial duck feed?
Do all of the ducks receive the same amount of each type of feed or do some ducks receive different amounts (e.g. female layers vs. male growers, etc)

Analysis

The results of proportional piling exercises from several groups can be averaged to derive an **aggregate** score for the community. You should pay close attention to the types of stakeholders or informants who participate in the interviews. Often, different stakeholders or informant groups will provide very different scores, and probing differences provides a lot of insight into the different perceptions and priorities of the groups.

Probing differences and calculating average scores for different segments of the community is known as analyzing the **disaggregated** results. For example, women often score diseases very differently from men because their needs and concerns differ from men.

More information about analyzing data from proportional piling exercises will be provided later in the training.

Exercise: Proportional Piling

Ask the women to leave the training room. The remaining men should identify 5 foods important in their household diet and pile counters relative to their importance. Ask them to explain the reasons for their proportions.

Ask the men to leave the room and the women to return. Repeat the exercise.

Bring the entire group back together to present the results. Discuss the following questions:

- Were there differences between the results for the men and the women?
- Why were their differences?
- How might men and women differ in their responses to questions regarding livestock husbandry and disease?

Group practice: Proportional Piling

Split into four groups. Each group should discuss one of the following questions.

- How can proportional piling be used to evaluate food security concerns?
- How can proportional piling be used to prioritize community development activities?
- How can proportional piling be used to study the impacts of a new disease?
- How can proportional piling be used to evaluate for risk factors for disease spread?

Ask each group to summarize their discussion on flipchart paper and present to the other groups.

Presentation: Proportional Piling for Morbidity and Mortality (PPMM)

A more specific use for proportional piling is to demonstrate the impact of diseases on the herd or flock, by demonstrating the relative morbidity, herd or flock mortality and case fatality of different diseases. This activity can be done by consensus with a small group or individually with each livestock keeper. If done individually, aggregate scores can be calculated after the interview. The advantages of this method are (1) it does not require the actual number of animals in the herd to be known and (2) it compares the morbidity and mortality of different diseases; this can reduce bias towards an individual disease problem. Diseases mentioned by farmers can be infectious or non-infectious (e.g. nutritional, developmental, genetic, accidental).

Method of proportional piling for morbidity and mortality

1. Use a pile of 100 counters to represent the flock or herd of animals.
2. Ask the farmer(s) to show what proportion of the flock or herd was healthy and what proportion became sick in the past year (no need to count the beans at this point).
3. Using the list of common diseases already given during the interview, write the names of the diseases on cards or use pictures or objects to represent the diseases. Use no more than four or five diseases, grouping all other mentioned diseases under a category called 'other diseases'.
4. Using the counters allocated to sick animals, ask the farmer(s) to divide the counters to show the proportion that suffered from each of the common diseases in the past year.
5. Taking one disease at a time, ask the farmer(s) to use the counters allocated to each disease to show what proportion of animals died and what proportion recovered out of the animals that suffered from the disease.
6. Count the counters after the farmer(s) has finished scoring each disease.
7. Summarize and crosscheck the results with the farmer(s).

Note: The methods can be repeated for each age group within a herd or flock. For example, the exercise could be conducted from adult goats and then repeated for kids to determine if different morbidity, mortality or case fatality rates are seen for the important diseases.

The method works well with either individuals or groups of informants. If the objective is to learn about individual herds the investigator should be careful when selecting the informant to conduct the exercise. The owners of the livestock are not necessarily the most knowledgeable about their health status, especially in the case of pastoral communities or migratory duck flocks. The caretakers that are with the herd or flock on a daily basis often know most about their health problems. In other situations, it may be children who work most closely with household animals (such as chickens or pigeons) that are the most informed.

If working with a group of informants, it is important that they are able to reach a consensus. Listen carefully to the discussion while they are debating the proportion of counters to place with each category. This debate can provide important information for probing and triangulation.

Movements of animals into and out of herds or flocks can be very complex and includes outputs and inputs for market and slaughter. 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 or to ask the informants to classify all of the animals present in their village. The method looks at the relative proportion of diseases observed during a given time period, rather than diseases affecting individual animals.

A strength of the method is that we do not 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.

Demonstration: Proportional Piling for Morbidity and Mortality

A study of cattle diseases is being conducted in Uganda. A group of farmers is asked to list the major diseases affecting their cattle. Although local terms are used for the diseases, through triangulation and probing, the investigator is able to create the following list based on what he is told by the farmers:

- Contagious Bovine Pleuro-pneumonia (CBPP)
- Foot and Mouth Disease (FMD)
- Anaplasmosis
- Heartwater
- East Coast Fever (ECF)

Following the steps of proportional piling for morbidity and mortality, one farmer is guided by the investigator to divide the counters to represent the status of his herd over the past year (see Figure 1).

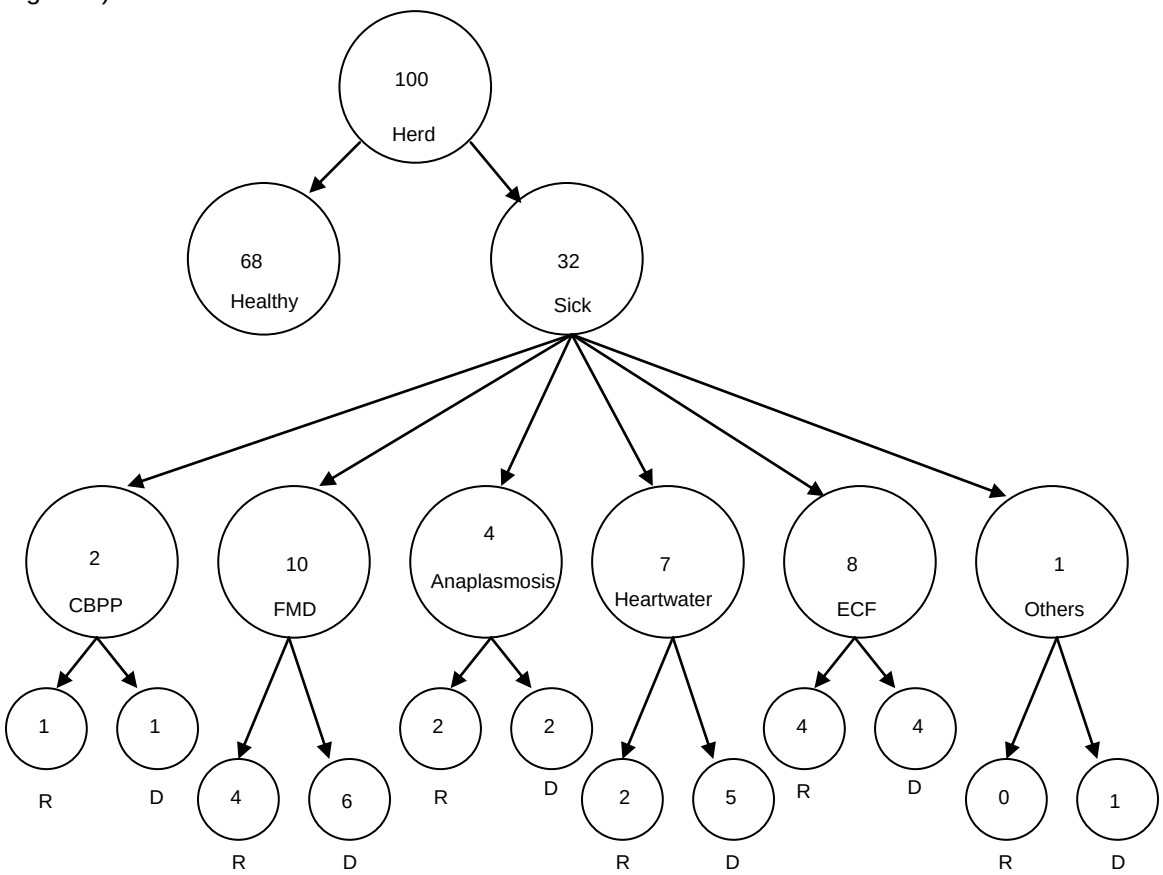


Figure 1: Example of proportional piling for morbidity and mortality for a cattle herd. (Note: R – recovered, D – died)

During and after the exercise, the farmer was probed to describe the symptoms of each disease, whether the rate of death described here was the same or different as that he had seen the year before, etc.

Later, using the data collected from this activity, the investigator was able to calculate:

1. Overall herd morbidity = (number sick/number in herd) x 100 %
   = (32/100) x 100% = 32%

2. Overall flock mortality = (number dead/number in herd) x 100%
   = (1 + 6 + 2 + 5 + 4 + 1)/100 = (19/100) x 100% = 19%

3. Overall case fatality = (number dead/number sick) x 100%
   = (19/32) x 100% = 59%

4. Morbidity due to specific disease = (number sick from disease/number in herd) x 100 %
   For example, morbidity due to FMD = (10/100) x 100% = 10%

5. Mortality due to specific disease = (number dead from disease/number in herd) x 100%
   For example, mortality due to FMD = (6/100) x 100% = 6%

6. Case fatality rate for specific disease = (number dead from disease/number sick from disease) x 100%
   For example, case fatality rate of FMD = (6/10) x 100% = 60%

Note: Calculating these frequencies is not part of the field exercise and is best conducted after the interview is finished.

Group Practice: Proportional Piling for Morbidity and Mortality by Age Group

Ask the participants to break up into 4 groups. One person in each group should be nominated as the investigator, another as the data recorder. The remaining group members will serve as informants and answer questions to the best of their knowledge based on local conditions. Use local names for diseases whenever possible. Each group should investigate one of the following cases:

1. Select 5 major diseases affecting cattle in your area. Conduct proportional piling for morbidity and mortality for these diseases in **adults** in the herds of a local village.
2. Select 5 major diseases affecting cattle in your area. Conduct proportional piling for morbidity and mortality for these diseases in **calves** in the herds of a local village.
3. Select 5 major diseases affecting sheep or goats in your area. Conduct proportional piling for morbidity and mortality for these diseases in **adults** in the flocks of a local village.
4. Select 5 major diseases affecting sheep or goats in your area. Conduct proportional piling for morbidity and mortality for these diseases in **lambs or kids** in the flocks of a local village.

Each group should calculate:

1. The overall herd/flock morbidity, mortality and case fatality rates.
2. Disease specific morbidity.
3. Disease specific mortality.
4. Disease specific case fatality.

Each group should present their results to the other groups. After each presentation, the following should be discussed:

1. Did the group conduct the exercise correctly? What went well? What went wrong? What could be improved next time?
2. Was the group able to reach consensus? What methods were used to reach consensus
3. if there were disagreements among informants?

After all groups have presented, the morbidity and mortality rates for each of the diseases should be compared between adult cattle and calves and adult sheep/goats and lambs/kids. Were the same diseases used for the exercise in the two species groups? Were the overall morbidity, mortality and case fatality rates the same or different? What about disease specific rates?

Handout: Proportional Piling

Proportional piling is a technique that allows farmers to give relative scores to a number of different items or categories according to one criterion. It can be done with an individual or by reaching consensus with a small group. The scoring is done by asking the farmers to divide 100 counters (beans, stones or similar items that are familiar to the community and locally available) into different piles that represent the categories. For example, the farmers could give scores to a set of disease problems (the categories) according to how important the diseases were to their livelihood (the parameter). Alternatively, the farmers could be asked to score the diseases according to how commonly they occur. Semi-quantitative data is collected by recording the number of counters in each category. This data can later be evaluated analytically.

Common uses of proportional piling during a semi-structured interview include the demonstration of:

1. Relative importance or population of livestock species in the village
2. Relative quantities of feed types provided to livestock
3. Sources of farm inputs (day old chicks, calves, feed, medicines, etc)
4. Relative incidence of diseases in the village
5. Relative importance of diseases to the livelihoods of farmers

Method of proportional piling

1. Have your proportional piling question clear in your own mind and write it down in your notebook.
2. To develop the list of items or categories for scoring, begin with an open-ended question. For example: *'What are the disease problems affecting your cattle?'*
3. Probe the responses; ask for descriptions and clarifications.
4. Explain that you want to carry out an exercise to better understand what you are learning about their livestock disease problems. Draw circles on the ground, one circle for each disease mentioned, and place a drawing or card next to each circle that illustrates the disease. Circles can also be made from construction paper or drawn on flipchart paper.
5. Place one hundred counters in a pile and ask the respondents to divide them according to a particular characteristic or parameter. Respondents do not need to count the counters but should divide them visually. For example, instruct the informants to divide the counters to represent the impact each disease has on their livelihood.
6. Make sure that they recognize each category by its drawing or name. Point at each category and say out loud what the drawing or name represents.
7. Give the informants time to discuss and divide the piles by consensus. When they appear to be finished, summarize and crosscheck the result. For example: *'You have scored this disease highest, followed by this one, then this one and this one is scored lowest. Do you all agree with these results?'*
8. Count the counters, but leave them in place so that the result can be discussed.
9. Probe the results. Why did they make the choices that they did?

It is usually best to conduct this exercise with small groups, although it can be used with larger groups or with individuals. They should discuss the division of the counters and arrive at their decision by consensus. Listening to the discussion and probing the results of the piling provides as much or more information than the final score. This information tells you why the respondents gave the scores that they did and tells a lot about how they view the problems.

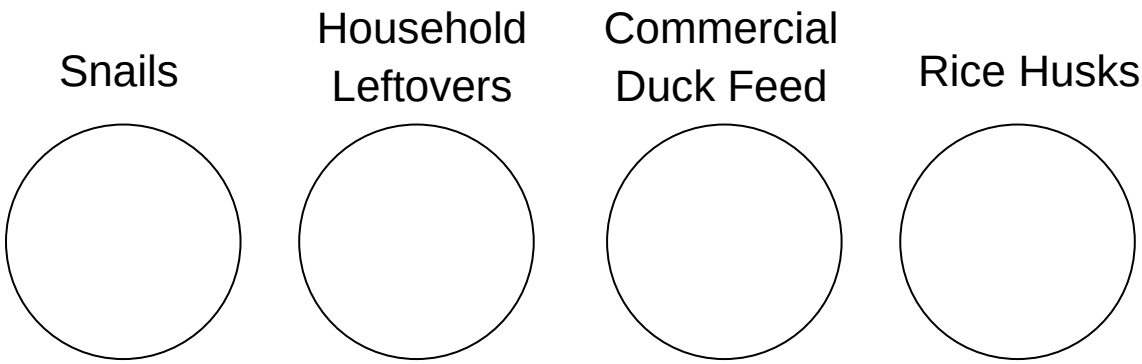
Example: Proportional Piling

The objective of this activity is to find out which types of feed are provided to duck flocks in the study area, and the relative proportions of each type that are provided.

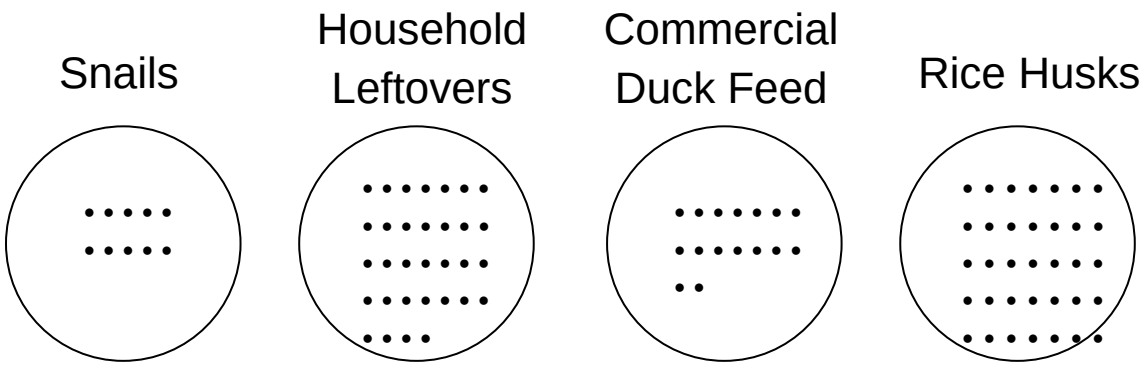
To develop a list of feed types, ask the duck farmers: What are the common feeds provided to ducks in the area? You may already have this information from earlier in the interview.

The farmers give the following responses: snails, household leftovers, commercial duck feed, and rice husks.

Draw four circles on flipchart paper, or use four index cards, and label them with images or words representing the farmers' responses.



Provide the farmers with 100 counters and ask them to distribute them relative to the amount of each type of feed that they provide to their ducks during a one week period. The farmers agree on the following proportions:



What questions might be asked of the farmers in order to get more information from this exercise?

Examples:
Why do rice husks make up the largest proportion of the ducks' diet?
Why are snails provided for the ducks and where are they obtained?
Where do you purchase commercial duck feed?
Do all of the ducks receive the same amount of each type of feed or do some ducks receive different amounts (e.g. female layers vs. male growers, etc)

Analysis

The results of proportional piling exercises from several groups can be averaged to derive an **aggregate** score for the community. You should pay close attention to the types of stakeholders or informants who participate in the interviews. Often, different stakeholders or informant groups will provide very different scores, and probing differences provides a lot of insight into the different perceptions and priorities of the groups.

Probing differences and calculating average scores for different segments of the community is known as analyzing the **disaggregated** results. For example, women often score diseases very differently from men because their needs and concerns differ from men.

More information about analyzing data from proportional piling exercises will be provided later in the training.

Handout: Proportional Piling for Morbidity and Mortality

A more specific use for proportional piling is to demonstrate the impact of diseases on the herd or flock, by demonstrating the relative morbidity, herd or flock mortality and case fatality of different diseases. This activity can be done by consensus with a small group or individually with each livestock keeper. If done individually, aggregate scores can be calculated after the interview. The advantages of this method are (1) it does not require the actual number of animals in the herd to be known and (2) it compares the morbidity and mortality of different diseases; this can reduce bias towards an individual disease problem. Diseases mentioned by farmers can be infectious or non-infectious (e.g. nutritional, developmental, genetic, accidental).

Method of proportional piling for morbidity and mortality

1. Use a pile of 100 counters to represent the flock or herd of animals.
2. Ask the farmer(s) to show what proportion of the flock or herd was healthy and what proportion became sick in the past year (no need to count the beans at this point).
3. Using the list of common diseases already given during the interview, write the names of the diseases on cards or use pictures or objects to represent the diseases. Use no more than four or five diseases, grouping all other mentioned diseases under a category called 'other diseases'.
4. Using the counters allocated to sick animals, ask the farmer(s) to divide the counters to show the proportion that suffered from each of the common diseases in the past year.
5. Taking one disease at a time, ask the farmer(s) to use the counters allocated to each disease to show what proportion of animals died and what proportion recovered out of the animals that suffered from the disease.
6. Count the counters after the farmer(s) has finished scoring each disease.
7. Summarize and crosscheck the results with the farmer(s).

Note: The methods can be repeated for each age group within a herd or flock. For example, the exercise could be conducted from adult goats and then repeated for kids to determine if different morbidity, mortality or case fatality rates are seen for the important diseases.

The method works well with either individuals or groups of informants. If the objective is to learn about individual herds the investigator should be careful when selecting the informant to conduct the exercise. The owners of the livestock are not necessarily the most knowledgeable about their health status, especially in the case of pastoral communities or migratory duck flocks. The caretakers that are with the herd or flock on a daily basis often know most about their health problems. In other situations, it may be children who work most closely with household animals (such as chickens or pigeons) that are the most informed.

If working with a group of informants, it is important that they are able to reach a consensus. Listen carefully to the discussion while they are debating the proportion of counters to place with each category. This debate can provide important information for probing and triangulation.

Movements of animals into and out of herds or flocks can be very complex and includes outputs and inputs for market and slaughter. 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 or to ask the informants to classify all of the animals present in their village. The method looks at the relative proportion of diseases observed during a given time period, rather than diseases affecting individual animals.

A strength of the method is that we do not 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.

Example: Proportional Piling for Morbidity and Mortality

A study of cattle diseases is being conducted in Uganda. A group of farmers is asked to list the major diseases affecting their cattle. Although local terms are used for the diseases, through triangulation and probing, the investigator is able to create the following list based on what he is told by the farmers:

- Contagious Bovine Pleuro-pneumonia (CBPP)
- Foot and Mouth Disease (FMD)
- Anaplasmosis
- Heartwater
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Following the steps of proportional piling for morbidity and mortality, one farmer is guided by the investigator to divide the counters to represent the status of his herd over the past year (see Figure 1).

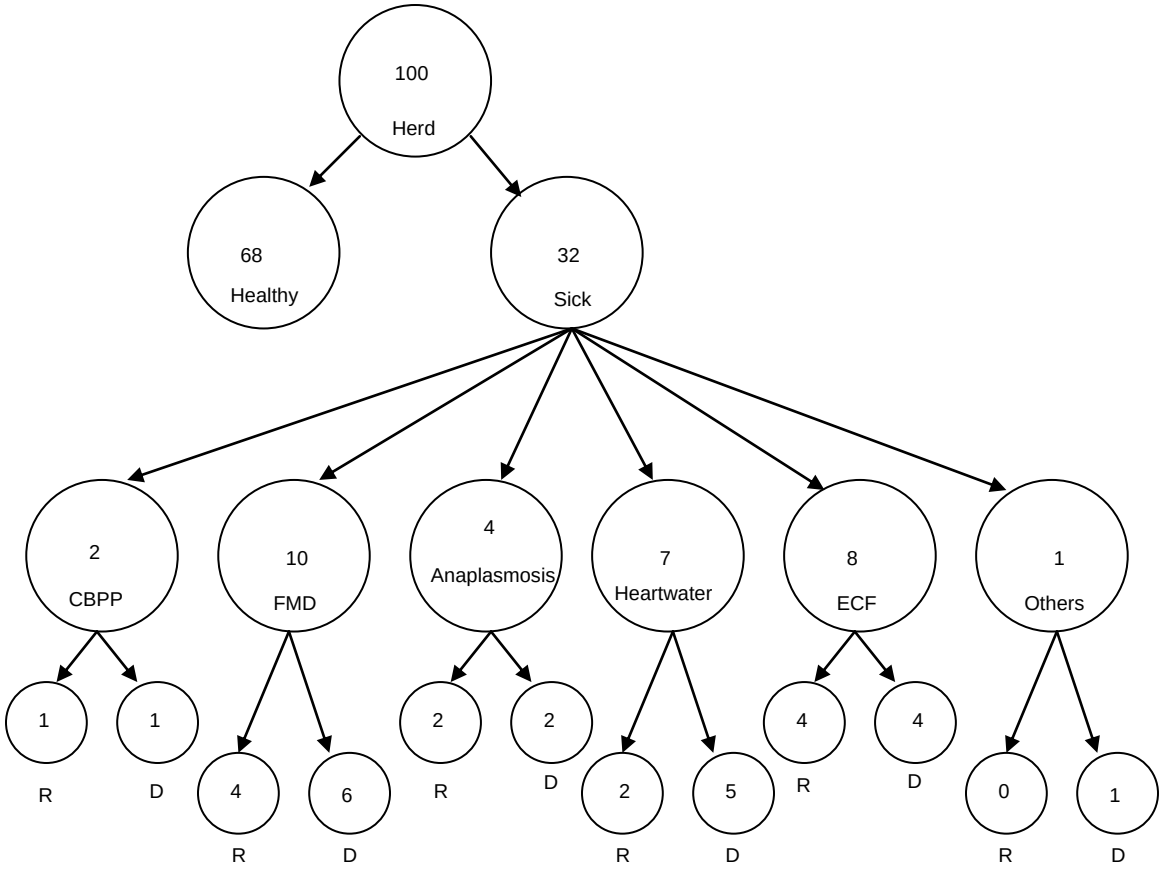

Figure 1: Example of proportional piling for morbidity and mortality for a cattle herd. (Note: R – recovered, D – died)

During and after the exercise, the farmer was probed to describe the symptoms of each disease, whether the rate of death described here was the same or different as that he had seen the year before, etc.

Later, using the data collected from this activity, the investigator was able to calculate:

1. Overall herd morbidity = (number sick/number in herd) x 100 %
   = (32/100) x 100% = 32%

2. Overall flock mortality = (number dead/number in herd) x 100%
   = (1 + 6 + 2 + 5 + 4 + 1)/100 = (19/100) x 100% = 19%

3. Overall case fatality = (number dead/number sick) x 100%
   = (19/32) x 100% = 59%

4. Morbidity due to specific disease = (number sick from disease/number in herd) x 100 %
   For example, morbidity due to FMD = (10/100) x 100% = 10%

5. Mortality due to specific disease = (number dead from disease/number in herd) x 100%
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   For example, case fatality rate of FMD = (6/10) x 100% = 60%

Note: Calculating these frequencies is not part of the field exercise and is best conducted after the interview is finished.

Chapter 4h: PE Tools - Matrix Scoring and Impact Matrix Scoring

Objectives

By the end of the session, the participants should be able to:

- Understand and demonstrate the use of matrix scoring
- Understand and demonstrate the use of matrix scoring for defining diseases
- Understand and demonstrate the use of impact matrix scoring

Session Planning

- Presentation – Matrix Scoring – 15 minutes
- Demonstration of matrix scoring – 15 minutes
- Group Practice – Simple Matrix Scoring – 45 minutes
- Demonstration – Matrix Scoring for Defining Diseases – 30 minutes
- Group Practice – Matrix Scoring for Defining Diseases – 45 minutes
- Presentation – Hints for Matrix Scoring– 15 minutes
- Presentation – Impact Matrix Scoring – 15 minutes
- Demonstration - Impact Matrix Scoring – 30 minutes
- Group Practice – Impact Matrix Scoring – 60 minutes

Total time: approximately 4 hours 30 minutes

Materials Needed

- Flip Chart Paper and markers
- Index Cards
- Counters
- Computer and Projector (optional)

Support Materials on Training CD

- Presentation – Matrix Scoring
- Presentation – Matrix Scoring for Disease Definitions
- Presentation – Tips for Matrix Scoring
- Presentation – Impact Matrix Scoring
- Participant Handout: Matrix Scoring

This module will cover two ranking and scoring tools: matrix scoring (in general) and impact matrix scoring.

Presentation: Matrix Scoring

Matrix scoring is essentially a series of proportional piling exercises where a list of items, such as diseases, is scored against a number of indicators, such as clinical signs or sources of infection, to create a matrix. Even after the proportional piling tool is mastered by PE practitioners, however, the method can seem difficult until it has been used numerous times both in practice exercises and in the field. It is essential that training participants get adequate practice with matrix scoring before the end of the training period.

A matrix is a systematic arrangement of data in rows (horizontal), columns (vertical) and cells (individual squares). The following matrix has six rows, four columns and twenty-four cells. All of the cells in a specific row or column share characteristics with one another.

Method for matrix scoring

1. Have a list of five to six items such as common diseases or disease syndromes that the participants have mentioned. Use the same names as used by the participants.
2. For each item, obtain a list of indicators, or characteristics, of the item. In the case of diseases, this may be the main clinical signs or epidemiological characteristics of the disease.
3. Use pictures, objects or cards to represent the items and place these across the top of the matrix.
4. Write the first indicators on a card or use a picture/object to represent it. Place this to one side of the first row of the matrix
5. Place a pile of counters next to the indicator and ask the participants to use the counters to show how strongly the indicator correlates with each item. Summarize and crosscheck for agreement on how they have scored.
6. Repeat for each indicator, gradually building up the matrix. Leave the matrix in place so that everyone can view the results and discuss as a group.
7. During the exercise and after the matrix is complete, it is essential that the investigator carefully probe the informants as to why they are scoring the way they are. After the matrix is complete, summarize the results and give the informants the opportunity to make changes if they wish.
8. Record the results in a matrix in your notebook.

This tool can take some time, so it is usually carried out with particularly knowledgeable farmers who are willing to spend a bit longer talking in detail. It should not be carried out during every interview unless this is a preset part of the study design.

Approximately five counters should be used per item across the top of the matrix. For example, if there are six categories (columns) then 30 counters should be used per indicator (row). If there are only four diseases, then 20 counters could be used. It is best not to have more than six items across the top and up to 10-12 indicators. If more are used, the exercise becomes more complex and lengthy and respondents will lose interest.

Demonstration: Matrix Scoring

To demonstrate this method, it is often better to use a simple example that is not related to veterinary epidemiology. This example uses popular food items.

Ask for 4 or 5 volunteers to help demonstrate the technique by serving as informants.

Ask the volunteers to list their favorite foods. Agree on a list of 5 or 6 foods. Write the food items on index cards and place them across the top of the matrix.

Next, ask the participants why they prefer these food items. These can be characteristics of the food such as taste, price, nutritional value, etc. Compare two of the foods that they described and ask them to tell you how those two foods are different. Agree on a list of 8-10 indicators and write each on an index card.

Place the first indicator on the left side of the matrix. Give the participants 30 counters and ask them to allocate them to indicate how strongly the indicator is associated with each food item. Repeat for each indicator to build the matrix.

Probe the matrix to cross-check e.g. you are saying that pounded yam is more difficult to prepare than the other food items?

Group Practice: Simple Matrix Scoring

Ask the participants to break up into groups of 4 or 5 people. One person will serve as the investigator and the rest as informants.

Ask the groups to conduct matrix scoring with one of the following topics:

1. Vacation Spots – Indicators: activities they engage in when on vacation there
2. Gifts– Indicators: characteristics of the gifts that they enjoy
3. Favorite sports activities – Indicators: benefits of engaging in the activity
4. Musical instruments – Indicators: characteristics of the instruments (such as what they are made of, ease of playing, etc).

Each group should record the results of their matrix scoring exercise on flipchart paper and present to the other groups. After each group presentation, the participants in the group should discuss what went well, what went wrong and how they would improve the activity next time.

After the presentations, ask the participants to discuss how matrix scoring could be used to better understand the diseases and disease syndromes described by farmers. What other ways can matrix scoring be used in participatory epidemiology?

- Epidemiological features of disease – differential diagnosis, associated syndromes
- Types of livestock raised and benefits derived from raising them (food, cash, social status, women's income, animal products, manure, gifts and loans)
- General livelihood activities in the household and which household members conduct them

Demonstration: Matrix Scoring for Disease Definitions

An important question to ask when conducting PE is: are the researchers and livestock keepers talking about the same diseases? When interviewing in local languages, technical veterinary terms are rarely used. An important first step in any PE study is to understand how farmers think about disease and characterize them. Matrix scoring can be a very useful tool for understanding the disease symptoms and epidemiological characteristics of the diseases described by the farmers.

Use the data presented in Table 1 to demonstrate to the participants how matrix scoring can be used to define diseases and disease syndromes described in local language by informants. The items to be characterized are common diseases affecting chickens in Uganda (kalusu, nsense, ebiwuka, kawali and senyiga).

When this data was gathered in Uganda, the informants listed 10 indicators that are associated with these 5 diseases. These include: high mortality, diarrhea, weight loss, fever, lesions on the wattle, cough, nasal discharge, airborne infection, and new bird introduction.

Create the matrix for the participants using volunteers from the class to distribute the counters (they will need a copy of the matrix).

Table 1: Example of matrix scoring of clinical signs and causes of common diseases of chickens, Uganda

	Kalusu	***Nsense***	***Ebiwuka***	***Kawali***	***Senyiga***
High mortality	14	5	2	1	8
Diarrhoea	8	11	9	1	1
Weight loss	4	11	12	1	2
Fever	15	8	0	3	4
Lesions on wattle	0	0	0	30	0
Cough	16	0	5	0	9
Nasal discharge	15	0	4	0	11
Airborne infection	14	0	0	0	16
New bird introduction	15	0	1	3	11

Ask the participants to discuss with their neighbor the veterinary definitions of the disease syndromes that have been described by the farmers in Uganda.

After 10 or 15 minutes, discuss the definitions that were developed by the participants. Ask if there are any questions about using matrix scoring to define diseases and disease syndromes using matrix scoring. Remind the participants that is it critically important to crosscheck the conclusions with local animal health specialists, textbooks, and direct observation.

Answers:
Kalusu = Newcastle Disease
Nsense = Coccidiosis
Ebiwuka = Gastrointestinal parasites
Kawali = Fowl pox
Senyiga = Respiratory Disease

Presentation: Tips for Matrix Scoring

1. Be patient – do not interfere with the discussion or try to hurry the informants.
2. Use a single species – if using the matrix scoring tool to define diseases and disease syndromes, it is best to use only one species of livestock such as chickens or goats.
3. Avoid "correcting" the results – it is a common mistake for investigators to give their opinions and "correct" he participants. Sometimes this develops into the investigator lecturing the informants about the right answer. Do not offer your views but instead use probing questions to reveal reasoning behind scores that seem strange to you.
4. Limit the items and indicators – too many items to score with a long list of indicators will cause the participants to get bored. It is recommended to keep the list of items around 6-8 and the list of indicators between 10-15 or less. If the informants make a long list of items or indicators, use simple ranking to determine which are the most important. If the participants are very dedicated however, you can use as many as you both wish.
5. Be aware of literacy – just as with other tools, if you are unsure of the literacy levels of all of the participants, it is better to use pictures or objects to represent items and indicators. Carefully explain the meaning of the symbols and repeat throughout the exercise to remind the informants of the meanings.
6. Column totals – do not make the mistake of totaling the columns. Indicators will often have different levels of importance or "weights" and summating the scores for each item has limited value. It is possible to ask the informants to weight the indicators by dividing the counters against the indicators in the first column before scoring each item in the row (see the section on Impact Matrix Scoring).
7. Let the matrix grow and leave it – do not clear the matrix until after you have interviewed the participants about the results. This will reveal more about the scores and open further areas for discussion. Visualizing the matrix allows the informants to better understand the differences between the diseases as well.
8. Be clear about the question – often investigators will ask the participants to pile the counters based on the "importance" of an indicator to the diseases listed in the matrix. It is key to define "important" as meaning that the indicator is either always associated with the disease or linked to the severity of the disease.
9. Use local language – it is helpful to prepare and test the instructions for matrix scoring using the local language of the informants before going to the field.
10. Leave copies of the matrix for the informants – copy the results of matrix scoring onto several sheets of paper to leave with the informants. This will give important feedback to the local people and allow them to discuss the results and learn from one another after the interview has come to an end.

For PE studies, it may be desirable to have a uniform matrix to be used across space and time to improve reliability and comparability of the results. In this case, run a few open matrices in selected areas to determine the key diseases of interest and the most important indicators. After the results of a few matrices are analyzed, select the common diseases and indicators and introduce them to the informants during the interview (in other words, the investigator sets up the matrix but the informants distribute the counters).

Group Practice – Matrix Scoring for Disease Definitions

Ask the participants to split into groups of 4 or 5 and practice matrix scoring for defining diseases and disease syndromes. One participant will serve as the investigator, the rest as informants.

Step one – What are the five most important diseases of goats (e.g. CCPP, PPR, heartwater, blackleg, mange, etc)

Step two – What are the clinical signs or epidemiological characteristics of these diseases (list 10).

Step three – Build the matrix using 30 counters per indicator.

Each group should present the results of their matrix. Discuss what went well, what went wrong and what could be improved next time. Discuss where differences occurred across the groups and potential reasons for this.

For some types of PE studies, a list of diseases (items) and clinical signs or epidemiological characteristics (indicators) may be provided to the participants so that matrix results can be compared over space and time.

What are the benefits and drawbacks of this approach?

Presentation: Impact Matrix Scoring

Impact matrix scoring is the same as simple matrix scoring except that the indicators (such as the benefits of keeping livestock) are weighted before they are compared to various categories (such as livestock species). In effect, a proportional piling exercise is conducted with the indicators before the counters are distributed across the categories to create a matrix. Disease impact matrix scoring (DIMS) is a specific type of impact matrix scoring that looks at the impact of diseases on the livelihoods of farmers.

Method for impact matrix scoring

1. Have a list of five to six items or categories (such as common species of livestock) that the informants have mentioned. Use the same names used by the informants.
2. For each item, obtain a list of indicators, or characteristics, of the item (in the case of livestock species, this may be the benefits of raising this type of livestock). Select up to 10 of the most important indicators from the overall list (you may use simple ranking to do this).
3. Use pictures, objects or cards to represent the indicators and place these in a row as for a proportional piling exercise. Give the informants approximately 10 counters per indicator (i.e. if there are 10 indicators, give them 100 counters).
4. Ask the informants to pile the counters on the indicators according to a question that you have asked (for example, how important is this indicator to your livelihood?). Record the results in your notebook.
5. Use pictures, objects or cards to represent the categories and place these across the top of the matrix.
6. Place the indicators to one side of the first column of the matrix. Keep the corresponding number of counters with each indicator.
7. Ask the informants to use the counters to show how strongly the indicator correlates with each category. Summarize and crosscheck for agreement on how they have scored.
8. Repeat for each indicator, gradually building up the matrix. Leave the matrix in place so that everyone can view the results and discuss as a group.
9. During the exercise and after the matrix is complete, it is essential that the investigator carefully probe the informants as to why they are scoring the way they are. After the matrix is complete, summarize the results and give the informants the opportunity to make changes if they wish.
10. Record the results in a matrix in your notebook.

Note: Unlike with simple matrix scoring, it is possible to sum the total number of counters in each column when doing impact matrix scoring because the indicators are weighted by importance. This figure will give an indication of how important the category is to the informants, or its overall impact.

Demonstration: Impact Matrix Scoring

Use the following example to demonstrate the methodology of impact matrix scoring to the participants.

You are in the middle of interviewing a group of key informants in a village when you decide you would like to learn more about the benefits of raising the types of livestock that they have

mentioned. The informants have already told you that they primarily raise five types of livestock: goats, cattle, chickens, ducks, and donkeys.

You ask the participants to list the benefits of raising each type of livestock and develop a list of eight indicators:

- Meat for family consumption
- Milk for family consumption
- Eggs for family consumption
- Social status
- Cultural tradition
- Draft power
- Products to sell at the market
- Source of emergency funds

You draw symbols representing the eight indicators on index cards and place them in a row in front of the participants. You ask them to conduct a proportional piling exercise with 100 counters based on the importance of each indicator to their livelihoods. After giving the participants some time to distribute the 100 counters and asking probing questions, you record the following results in your notebook:

Meat for family consumption	25
Milk for family consumption	15
Eggs for family consumption	8
Social status	4
Cultural tradition	4
Draft power	10
Products to sell at the market	22
Source of emergency funds	12
Total	**100**

Now it is time to create the matrix. Another set of cards is made to represent the categories, or types of livestock species mentioned by the participants. These are placed across the top of the matrix. The indicators with the corresponding number of counters are placed to the side of the first column of the matrix.

	Counters	Goats	Cattle	Chickens	Ducks	Donkeys
Meat for family consumption	25					
Milk for family consumption	15					
Eggs for family consumption	8					
Social status	4					
Cultural tradition	4					
Draft power	10					
Products to sell at the market	22					
Source of emergency funds	12					

The informants are asked to distribute the counters across the various columns according to how much the indicator corresponds to each livestock species. The following results are obtained:

	Goats	Cattle	Chickens	Ducks	Donkeys
Meat for family consumption	8	4	8	5	
Milk for family consumption	9	6			
Eggs for family consumption			5	3	
Social status		3			1
Cultural tradition	1	2	1		
Draft power					10
Products to sell at the market	6	12	1	3	
Source of emergency funds	4		6	2	
Total	**28**	**27**	**21**	**13**	**11**

You summarize the results for the informants. Based on the totals for each species of livestock, goats and cattle seem to be the most important species for their livelihood followed by chickens and then ducks and donkeys. The informants agree with these results.

Group Practice – Impact Matrix Scoring

Ask the participants to split into groups of 4 or 5 and practice impact matrix scoring. One participant will serve as the investigator, the rest as informants.

Step one – Using the same five diseases for goats listed in the previous group practice, ask the participants about the negative impacts these diseases have on animal production (e.g. decreased weight gain, death, decreased reproduction, decreased milk production, etc.)

Step two – Conduct a proportional piling exercise to weigh the indicators.

Step three – Build the matrix according to how well the indicators correlate with each disease. Use the number of counters weighted for each indicator during the proportional piling exercise.

Step four – Sum the columns of the matrix. Ask the participants if the disease with the highest score correlates to the disease that they feel has the most negative impact on their livelihoods. Give the participants the opportunity to change their results.

Each group should present the results of their matrix. Discuss what went well, what went wrong and what could be improved next time. Discuss where differences occurred across the groups and potential reasons for this.

Ask the participants how they feel about using this tool versus simple matrix scoring. Is the additional step confusing? Does it provide helpful/useful information in some scenarios?

Handout – Matrix Scoring

Matrix scoring is essentially a series of proportional piling exercises where a list of items, such as diseases, is scored against a number of indicators, such as clinical signs or sources of infection, to create a matrix. Even after the proportional piling tool is mastered by PE practitioners, however, the method can seem difficult until it has been used numerous times both in practice exercises and in the field. It is essential that training participants get adequate practice with matrix scoring before the end of the training period.

Method for matrix scoring

1. Have a list of five to six items such as common diseases or disease syndromes that the participants have mentioned. Use the same names as used by the participants.
2. For each item, obtain a list of indicators, or characteristics, of the item. In the case of diseases, this may be the main clinical signs or epidemiological characteristics of the disease.
3. Use pictures, objects or cards to represent the items and place these across the top of the matrix.
4. Write the first indicators on a card or use a picture/object to represent it. Place this to one side of the first row of the matrix
5. Place a pile of counters next to the indicator and ask the participants to use the counters to show how strongly the indicator correlates with each item. Summarize and crosscheck for agreement on how they have scored.
6. Repeat for each indicator, gradually building up the matrix. Leave the matrix in place so that everyone can view the results and discuss as a group.
7. During the exercise and after the matrix is complete, it is essential that the investigator carefully probe the informants as to why they are scoring the way they are. After the matrix is complete, summarize the results and give the informants the opportunity to make changes if they wish.
8. Record the results in a matrix in your notebook.

This tool can take some time, so it is usually carried out with particularly knowledgeable farmers who are willing to spend a bit longer talking in detail. It should not be carried out during every interview unless this is a preset part of the study design.

Approximately five counters are used per item across the top of the matrix. In the example above, there are five diseases so 30 beans were used. If there were only four diseases, then 20 counters could be used. It is best not to have more than six items across the top and up to 10-12 indicators. If more are used, the exercise becomes more complex and lengthy and respondents will lose interest.

Matrix Scoring for Disease Definitions

An important question to ask when conducting PE is: are the researchers and livestock keepers talking about the same diseases? When interviewing in local languages, technical veterinary terms are rarely used. An important first step in any PE study is to understand how farmers think about disease and characterize them. Matrix scoring can be a very useful tool for understanding the disease symptoms and epidemiological characteristics of the diseases described by the farmers.

Example: Disease symptoms and epidemiological characteristics of common diseases affecting chickens in Uganda (kalusu, nsense, ebiwuka, kawali and senyiga).

	Kalusu	***Nsense***	***Ebiwuka***	***Kawali***	***Senyiga***
High mortality	14	5	2	1	8
Diarrhoea	8	11	9	1	1
Weight loss	4	11	12	1	2
Fever	15	8	0	3	4
Lesions on wattle	0	0	0	30	0
Cough	16	0	5	0	9
Nasal discharge	15	0	4	0	11
Airborne infection	14	0	0	0	16
New bird introduction	15	0	1	3	11

Based on the above matrix, which veterinary disease terms correspond with the above local disease names?

Newcastle Disease _____

Coccidiosis _____

Gastrointestinal parasites _____

Fowl pox _____

Respiratory Disease _____

Impact Matrix Scoring

Impact matrix scoring is the same as simple matrix scoring except that the indicators (such as the impacts of livestock diseases) are weighted before they are compared to various categories (such as diseases). In effect, a proportional piling exercise is conducted with the indicators before the counters are distributed across the categories to create a matrix.

Method for impact matrix scoring

1. Have a list of five to six items or categories (such as common species of livestock) that the informants have mentioned. Use the same names used by the informants.
2. For each item, obtain a list of indicators, or characteristics, of the item (in the case of livestock species, this may be the benefits of raising this type of livestock). Select up to 10 of the most important indicators from the overall list (you may use simple ranking to do this).
3. Use pictures, objects or cards to represent the indicators and place these in a row as for a proportional piling exercise. Give the informants approximately 10 counters per indicator (i.e. if there are 10 indicators, give them 100 counters).

4. Ask the informants to pile the counters on the indicators according to a question that you have asked (for example, how important is this indicator to your livelihood?). Record the results in your notebook.
5. Use pictures, objects or cards to represent the categories and place these across the top of the matrix.
6. Place the indicators to one side of the first column of the matrix. Keep the corresponding number of counters with each indicator.
7. Ask the informants to use the counters to show how strongly the indicator correlates with each category. Summarize and crosscheck for agreement on how they have scored.
8. Repeat for each indicator, gradually building up the matrix. Leave the matrix in place so that everyone can view the results and discuss as a group.
9. During the exercise and after the matrix is complete, it is essential that the investigator carefully probe the informants as to why they are scoring the way they are. After the matrix is complete, summarize the results and give the informants the opportunity to make changes if they wish.
10. Record the results in a matrix in your notebook.

Note: Unlike with simple matrix scoring, it is possible to sum the total number of counters in each column when doing impact matrix scoring because the indicators are weighted by importance. This figure will give an indication of how important the category is to the informants, or its overall impact.

Example: You are in the middle of interviewing a group of key informants in a village when you decide you would like to learn more about the benefits of raising the types of livestock that they have mentioned. The informants have already told you that they primarily raise five types of livestock: goats, cattle, chickens, ducks, and donkeys.

You ask the participants to list the benefits of raising each type of livestock and develop a list of eight indicators:

- Meat for family consumption
- Milk for family consumption
- Eggs for family consumption
- Social status
- Cultural tradition
- Draft power
- Products to sell at the market
- Source of emergency funds

You draw symbols representing the eight indicators on index cards and place them in a row in front of the participants. You ask them to conduct a proportional piling exercise with 100 counters based on the importance of each indicator to their livelihoods. After giving the participants some time to distribute the 100 counters and asking probing questions, you record the following results in your notebook:

Meat for family consumption	25
Milk for family consumption	15
Eggs for family consumption	8
Social status	4
Cultural tradition	4
Draft power	10
Products to sell at the market	22
Source of emergency funds	12
Total	100

Now it is time to create the matrix. Another set of cards is made to represent the categories, or types of livestock species mentioned by the participants. These are placed across the top of the matrix. The indicators with the corresponding number of counters are placed to the side of the first column of the matrix.

	Counters	Goats	Cattle	Chickens	Ducks	Donkeys
Meat for family consumption	25					
Milk for family consumption	15					
Eggs for family consumption	8					
Social status	4					
Cultural tradition	4					
Draft power	10					
Products to sell at the market	22					
Source of emergency funds	12					

The informants are asked to distribute the counters across the various columns according to how much the indicator corresponds to each livestock species. The following results are obtained:

	Goats	Cattle	Chickens	Ducks	Donkeys
Meat for family consumption	8	4	8	5	
Milk for family consumption	9	6			
Eggs for family consumption			5	3	
Social status		3			1
Cultural tradition	1	2	1		
Draft power					10
Products to sell at the market	6	12	1	3	
Source of emergency funds	4		6	2	
Total	**28**	**27**	**21**	**13**	**11**

You summarize the results for the informants. Based on the totals for each species of livestock, goats and cattle seem to be the most important species for their livelihood followed by chickens and then ducks and donkeys. The informants agree with these results.

Chapter 4i: PE Tools: Participatory Mapping and Venn Diagrams

Objectives

By the end of the session, the participants should be able to:

- Explain the role of visualization methods compared with verbal methods in PE
- Understand and demonstrate the use of participatory mapping.
- Understand and demonstrate the use of Venn Diagrams as a PE tool.

Session Planning

- Presentation on participatory mapping – 20 minutes
- Group Practice – Participatory Mapping – 40 minutes
- Group Discussion – Participatory Mapping – 60 minutes
- Presentation on Venn Diagrams – 15 minutes
- Group Practice – Venn Diagrams 15 minutes

Total time: 2 hours 30 minutes

Materials Needed

- Flip Chart Paper and markers
- Computer and Projector (optional)

Support Materials on Training CD

- Presentation on Participatory Mapping
- Example photographs of participatory maps
- Presentation on Venn Diagrams
- Handouts
  - Participatory Mapping
  - Venn Diagrams

A Note about PE Tools

Numerous tools have been developed for use by the PE investigator to assist with communication. As mentioned in the introduction, these tools can be classified into three groups:

9. **Informal interviewing**: Semi-structured interviews, with key informants, focus-group discussions
10. **Ranking and scoring**: Simple ranking, pair-wise ranking, proportional piling, matrix scoring
11. **Visualisation**: Participatory Mapping, timelines, seasonal calendars, Venn diagrams

Different PE tools can be used to investigate the same issues or diseases. Although the methods are intended primarily to explore different aspects of the issue, there will be some overlap in the information generated. This overlap is often most evident from answers given to probing questions asked after each tool is used and is important for triangulation of disease information.

This module will cover two visualization tools: mapping and Venn diagrams.

Visualization Tools

Important advantages of visualization techniques are:

- they demonstrate information that cannot be easily communicated orally
- information collected can be used to triangulate information from the SSI

Participatory Mapping

Participatory mapping is a technique for physically diagramming key resources, hazards, and land use. It is one of the most useful tools of participatory epidemiology because sometimes it is easier to draw a map than to describe spatial relationships orally. It can be used at the beginning of the SSI to define the spatial boundary of the area under investigation. It acts as an ice-breaker because many people can be involved. It can also be referenced through the rest of the interview whenever spatial issues arise, such as location of disease outbreaks and spread of disease through an area over time. Maps can illuminate risk factors for disease outbreaks and spread.

Participatory maps can illustrate:

- general features (main roads, waterways, meeting places, schools, etc.)
- community boundaries
- infrastructure
- livestock density, species, management system, etc
- grazing movements
- trade movements
- vector prone and disease prone areas
- disposal areas
- sources of inputs (feed, veterinary clinics, hatcheries, etc)
- crop areas
- human housing areas
- neighboring communities
- natural resources

Maps produced on the ground using locally-available materials are easy to adjust until informants are happy that the map is correct. Maps do not need written words or labels, and therefore non-literate people can participate.

As with other activities, it is useful to prepare a mental checklist of items to be probed during the mapping exercise. Respondents should not only be asked to illustrate locations on the map, but to provide underlying reasons for movements and resource use. At the end of the interview, maps can be used to plan for disease control activities.

Method for participatory mapping

1. Request the group to draw key features of their village or area on a map, e.g. the place of the meeting, main roads, waterways, important public places, etc.
2. Request the group to draw key livestock features, e.g. grazing areas, watering points, markets where animals are sold, slaughtering points, veterinary services, locations of farms, disposal sites, seasonal movements, trade routes etc.
3. Once the map is completed, or while participants are drawing the map, ask probing questions, e.g. *How are animals marketed? Where do new animals come from? Where did a disease outbreak occur?*
4. To finalize the map, find out the direction of North and mark it on the map. Also try to obtain an idea of scale by asking the distance between two key points and then add an approximate scale. If symbols are used to represent features, add a key to the map.
5. Copy the map into a notebook or take a photograph of the map.

Helpful Tips:

1. Depending on the location of the meeting and the type of participants, the map may be drawn on the ground and features represented by objects such as stones or sticks, or it can be drawn on flip chart paper with colored marker pens. It is important that the map is large so that everyone can see it and contribute to its development.
2. Maps can be drawn on different scales depending on the objective of the study being carried out. The map could be of a farm and its surrounding area, a village and its surrounding area, a district or even a country.
3. A blank sheet of paper can be intimidating. If the participants have trouble getting starting, start by adding a feature that the informants have mentioned and then ask where another feature is located relative to the first. Ask them to draw or place this feature on the map themselves.
4. The map doesn't have to be of the village it can also be of an area, it all depends on the question asked.
5. Some informants may not know the directions (North, South, East, and West). You may ask them in which direction the sun rises and mark this on the map.
6. If the informants cannot estimate approximate distances (in meters or kilometers), ask them how long it takes to walk from one location to another and mark this on the map.
7. The informants may appreciate if you leave a copy of the map behind for them to reference. This is a way of giving back to the community. Be sure that the results are adequately documented.

Group Practice: Participatory Mapping

Ask the participants to break into small groups of 4-5 people to practice participatory mapping. Each group should select an area to map that is familiar to all members. This could be their country, state, district or city.

Each group member should take a turn mapping a different attribute. These may include:

- Major boundaries
- Important roads
- major waterways, lakes, wetlands and oceans including ports
- urban and rural areas
- national forests and parks
- livestock production areas by species and management system
- movements of livestock marketing

If all of the participants are from different areas, ask them to map the training venue. They can include attributes such as:

- training room
- outdoor and recreational areas
- restaurants and cafeterias
- housing or guest rooms
- other facilities

Group Discussion: Participatory Mapping

Give each group about 10 minutes to present their map to the other groups. After each presentation, the group should discuss

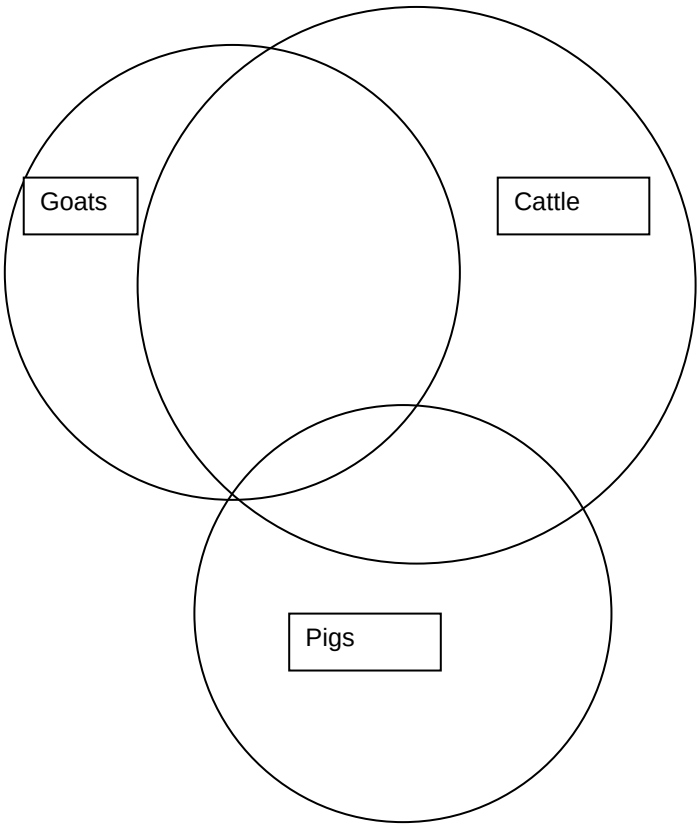
- What went well?
- What went wrong?
- What should be done differently next time?

Ask the group to discuss how participatory mapping can help us better understand risk factors for disease spread. Use one of the group maps as an example.

Venn Diagrams

Venn diagrams show logical relationships between sets or groups of items or characteristics. They are comprised of various sized circles based on the importance of the item or characteristic. The degree of overlap (or non-overlap) indicates the inter-relatedness of the items.

An example of a simple Venn diagram used for PE would be to make various sized circles based on the number of each species of livestock present in the village. Two or three of the species are selected to demonstrate management practices. The circles are overlapped to show how these species are handled the same or differently from each other.



The above example demonstrates that cattle are the most important species to the community followed by goats and then pigs. There is a great degree of overlap between the way goats and cattle are raised but only a small amount of overlap with how pigs and cattle are raised and hardly any overlap with how pigs and goats are raised. Goats and cattle share pasture, feed and are de-wormed and vaccinated at the same time. All three species are sometimes housed together but usually pigs are housed with cattle or alone. When probed, the informants revealed that the only management aspect that is shared among all three species is that they sometimes share a common water source.

Venn diagrams can provide useful information on relationships that are difficult to describe orally. The ways in which informants organize the diagram can provide insight into their thinking about

management practices and other topics of interest such as farm input resources, animal health services, etc.

Group Practice: Venn Diagrams

Ask the participants to break into small groups of 4-5 people to discuss Venn Diagrams and PE.

- Give 3 examples of how Venn Diagrams could be used during a semi-structured interview to learn more about livestock diseases and their control
- Select one of these examples and draw an example diagram
- Be ready to present to the other participants the rationale for circle size selection and the degree of overlap between categories

Give each group about 10 minutes to present their 3 examples and present their diagram to the other groups.

Handout: Participatory Mapping

Participatory mapping is a technique for physically diagramming key resources, hazards, and land use. It is one of the most useful tools of participatory epidemiology because some it is easier to draw a map than to describe spatial relationships orally. It can be used at the beginning of the SSI to define the spatial boundary of the area under investigation. It acts as an ice-breaker because many people can be involved. It can also be referenced through the rest of the interview whenever spatial issues arise, such as location of disease outbreaks and spread of disease through an area over time. Maps can illuminate risk factors for disease outbreaks and spread.

Participatory maps can illustrate:

- general features (main roads, waterways, meeting places, schools, etc.)
- community boundaries
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- livestock density, species, management system, etc
- grazing movements
- trade movements
- vector prone and disease prone areas
- disposal areas
- sources of inputs (feed, veterinary clinics, hatcheries, etc)
- crop areas
- human housing areas
- neighboring communities
- natural resources

Maps produced on the ground using locally-available materials are easy to adjust until informants are happy that the map is correct. Maps do not need written words or labels, and therefore non-literate people can participate.

As with other activities, it is useful to prepare a mental checklist of items to be probed during the mapping exercise. Respondents should not only be asked to illustrate locations on the map, but to provide underlying reasons for movements and resource use. At the end of the interview, maps can be used to plan for disease control activities.

Method for participatory mapping

1. Request the group to draw key features of their village or area on a map, e.g. the place of the meeting, main roads, waterways, important public places, etc.
2. Request the group to draw key livestock features, e.g. grazing areas, watering points, markets where animals are sold, slaughtering points, veterinary services, locations of farms, disposal sites, seasonal movements, trade routes etc.
3. Once the map is completed, or while participants are drawing the map, ask probing questions, e.g. *How are animals marketed? Where do new animals come from? Where did a disease outbreak occur?*
4. To finalize the map, find out the direction of North and mark it on the map. Also try to obtain an idea of scale by asking the distance between two key points and then add an approximate scale. If symbols are used to represent features, add a key to the map.
5. Copy the map into a notebook or take a photograph of the map.

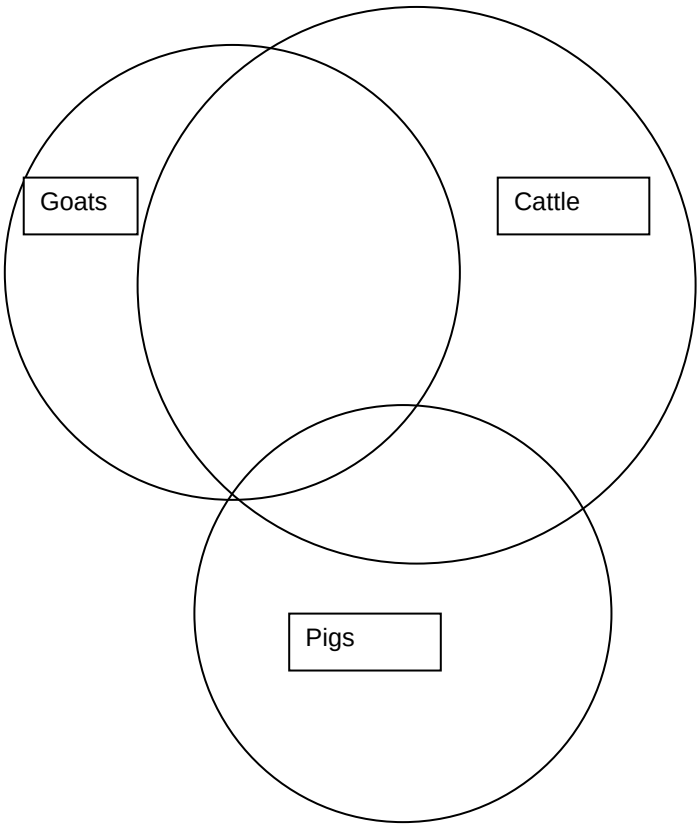
Helpful Tips:

1. Depending on the location of the meeting and the type of participants, the map may be drawn on the ground and features represented by objects such as stones or sticks, or it can be drawn on flip chart paper with colored marker pens. It is important that the map is large so that everyone can see it and contribute to its development.
2. Maps can be drawn on different scales depending on the objective of the study being carried out. The map could be of a farm and its surrounding area, a village and its surrounding area, a district or even a country.
3. The map can be drawn either interactively (with suggestions and probing questions from the investigator) or the informants can be left alone to draw the map and then asked to explain the map to investigator.
4. A blank sheet of paper can be intimidating. If the participants have trouble getting starting, start by adding a feature that the informants have mentioned and then ask where another feature is located relative to the first. Ask them to draw or place this feature on the map themselves.
5. Some informants may not know the directions (North, South, East, West). You may ask them in which direction the sun rises and mark this on the map.
6. If the informants cannot estimate approximate distances (in meters or kilometers), ask them how long it takes to walk from one location to another and mark this on the map.
7. The informants may appreciate if you leave a copy of the map behind for them to reference. This is a way of giving back to the community. Be sure that the results are adequately documented.

Handout: Venn Diagrams

Venn diagrams show logical relationships between sets or groups of items or characteristics. They are comprised of various sized circles based on the importance of the item or characteristic. The degree of overlap (or non-overlap) indicates the inter-relatedness of the items.

An example of a simple Venn diagram used for PE would be to make various sized circles based on the number of each species of livestock present in the village. Two or three of the species are selected to demonstrate management practices. The circles are overlapped to show how these species are handled the same or differently from each other.



The above example demonstrates that cattle are the most important species to the community followed by goats and then pigs. There is a great degree of overlap between the way goats and cattle are raised but only a small amount of overlap with how pigs and cattle are raised and hardly any overlap with how pigs and goats are raised. Goats and cattle share pasture, feed and are dewormed and vaccinated at the same time. All three species are sometimes housed together but usually pigs are housed with cattle or alone. When probed, the informants revealed that the only management aspect that is shared among all three species is that they sometimes share a common water source.

Venn diagrams can provide useful information on relationships that are difficult to describe orally. The ways in which informants organize the diagram can provide insight into their thinking about

management practices and other topics of interest such as farm input resources, animal health services, etc.

Chapter 4j: PE Tools - Seasonal Calendars and Timelines

Objectives

By the end of the session, the participants should be able to:

- Understand and demonstrate the use of seasonal calendars.
- Understand and demonstrate the use of timelines in PE.

Session Planning

- Presentation – Seasonal Calendars – 20 minutes
- Demonstration – Seasonal Calendars – 30 minutes
- Group Practice – Seasonal Calendars – 60 minutes
- Presentation – Timelines – 20 minutes
- Group Practice – Timelines - 60 minutes

Total time: 3 hours

Materials Needed

- Computer and Projector (optional)
- Flip Chart Paper and markers
- Counters

Support Materials on Training CD

- Presentation – Seasonal Calendars
- Example photographs of Seasonal Calendars and Timelines
- Presentation – Timelines
- Handouts:
    - Seasonal Calendars
    - Timelines

A Note about PE Tools

Numerous tools have been developed for use by the PE investigator to assist with communication. As mentioned in the introduction, these tools can be classified into three groups:

12. **Informal interviewing**: Semi-structured interviews, with key informants, focus-group discussions
13. **Ranking and scoring**: Simple ranking, pair-wise ranking, proportional piling, matrix scoring
14. **Visualisation**: Participatory Mapping, timelines, seasonal calendars, Venn diagrams

Different PE tools can be used to investigate the same issues or diseases. Although the methods are intended primarily to explore different aspects of the issue, there will be some overlap in the information generated. This overlap is often most evident from answers given to probing questions asked after each tool is used and is important for triangulation of disease information.

This module will cover two visualization tools: seasonal calendars and timelines.

As with other modules, the seasonal calendar can be taught by giving a brief introduction and background, demonstrating the method and allowing time for practice.

Presentation: Seasonal Calendars

Temporal variations in disease occurrence are a common aspect of epidemiological investigation. Many animal health problems and issues show seasonal variation. Seasonal calendars are a useful method for understanding local perceptions of seasonal variations in disease incidence or risk factors for disease. A seasonal calendar can be used to visualize and analyze local perceptions of the seasonality of key farming practices, diseases, risk factors etc. The seasonal occurrence of diseases is interesting to understand in relation to the seasonality of these factors. New or unusual factors may emerge that are important in the particular area. The information can be useful for improving disease mitigation strategies such as timing of prophylactic vaccination or treatment. 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.

In order to be able to construct a seasonal calendar, it is first necessary to be familiar with local terminology and descriptions of seasons and how these relate to the months of the year. This information can be gathered from key informants. The seasonality of different events or activities of interest is then demonstrated by indicating the timing of occurrence or scoring occurrence in relation to the seasons.

Seasons are defined by different characteristics in different regions. In tropical areas seasons are often defined by the amount of rainfall while in temperate areas seasons are divided based on the temperature or length of day. Understanding the characteristic that are used to define the seasons in the area under investigation is the first step in creating a seasonal calendar. Then other seasonal events (indicators) can also be investigated. These may include:

- disease outbreaks

- availability of grazing pasture
- access to water
- presence of wild animals or birds
- presence of vectors
- movement of livestock
- calving seasons
- availability of animal housing
- prophylactic treatments such as vaccination
- buying in stock or off-take
- harvests
- festivals, holidays
- taxes or collection of other fees

Method

Based on information previously gathered in the interview, the interviewer should be familiar with local farming practices, common disease problems and the factors that may affect disease occurrence. From this information a list of indicators (diseases or risk factors) may be developed and the following method used to explore seasonality.

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1. Draw a line on the ground or at the top of a piece of flip chart paper and indicate that this represents one year.
2. Ask the informants to describe the seasons that they experience during the year. Record the local names for these seasons. Ask the participants to divide the line into seasons based on their occurrence and length during the year.
3. Label the seasons by either be writing them on cards or representing them with local objects or pictures. If the months of the year are commonly used, then write these along the line above or below the relevant seasons.
4. Ask the informants about a key indicator that defines the seasons in the area (rainfall, temperature, length of day, etc). Give them a pile of 20-30 counters and ask them to divide the counters between the seasons to show the relative association of the indicator with that season. All the counters should be used. Draw a line to create the first row of the calendar. Record the results but do not remove the counters.
5. Repeat this with each indicator (activity, event, disease) on a new line, using 20-30 counters each time, so that gradually a matrix is built up (see example in Table 1). The name of the indicator may be written on the flip chart or on a card and placed at the side of the matrix. For illiterate participants, a picture or object may represent the indicator.
6. Once the calendar has been completed, the results should be discussed with the informants using open and probing questions, for example: *Why is this disease more common in this season? Do you know what causes this disease? So this disease seems to occur when there is a lot of rain, is that correct?*

Table 1: Example of a seasonal calendar for cattle diseases in Maasai community, Tanzania (translated into English)

	J	F	M	A	M	J	J	A	S	O	N	D
	DRY SEASON		HEAVY RAIN SEASON			COLD AND DRY SEASON				SHORT RAIN SEASON		
Rainfall			ooooooooooo			o				ooooooo		
East Coast fever	oooo		oooooooo			ooooo				oo		
Rift Valley fever	oo		ooooooo			ooooooo				oooo		
Lumpy skin disease			ooooooooooooooo			ooo				o		
Peste des petits ruminants	ooooooooo									ooooooooo		
Anaplasmosis	oo		ooooooo			ooooooo				oooo		
Contagious bovine pleuropneumonia	oooooo		oooooo			ooooo				ooo		
Foot and mouth disease	o		ooooooooo			o				ooooooooo		
Malignant catarrhal fever			ooooooooooooooo			oooo						
Trypanosomiasis	oo		ooooo			ooooooooo				ooo		
Tsetse flies	o		oooo			ooooooooo				oooooo		
Ticks	oo		ooooooo			ooooooo				ooo		

Alternative method: Timing of occurrence

This method simply indicates the presence or absence of an indicator by season rather than scoring, and therefore gives useful but less detailed information (see Table 2).

1. Draw a line on the ground or at the top of a piece of flip chart paper and indicate that this represents one year.
2. Ask the informants to describe the seasons that they experience during the year. Record the local names for these seasons.
3. Write the seasons along the line in the order in which they occur while crosschecking with the participants. The names can either be written on cards or represented with local objects or pictures.
4. If the months of the year are commonly used, then write these along the line next to the relevant seasons.
5. Ask the participants to think about rainfall and how it varies with the seasons. Ask them to mark on the matrix when rainfall occurs; draw on ground with a stick or on flip chart paper with a marker pen.
6. Repeat this with each indicator (activity, event, disease). The name of the indicator may be written on a card or on the flip chart and placed at the side of the matrix. For illiterate participants, a picture or object may represent the indicator. The indicators used will be linked to the species or disease(s) of interest. They may be determined before the PE interview but are likely to be added to or modified as a result of discussions during the interview.
7. Once the calendar has been completed, the results should be discussed with the participants using open and probing questions, for example: *Why is this disease*

more common in this season? Do you know what causes this disease? So this disease seems to occur when there is a lot of rain, is that correct?

Table 2: Example of a seasonal calendar of diseases (Tororo/Butaleja HPAI PDS, Uganda)

	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
	Dry Season		Rainy Season			Dry Season		Rainy Season			Dry Season	
Rains			■	■	■			■	■	■		
Kawoya (ND)	■	■				■	■				■	■
Amabwa (Fowl pox)	■	■	■	■	■	■	■	■	■	■	■	■
Ehidukhano sio musayi (Coccidiosis)			■	■	■			■	■	■		
Ekusa/nafuya (Fleas/mites)	■	■	■	■	■	■	■	■	■	■	■	■
Senyiga (Respiratory signs)			■	■	■			■	■	■		

Tips for Seasonal Calendars:

1. Not all cultures use the Gregorian calendar based on 12 months in a year (January – December). This is why it is important to start by asking informants to describe the seasons before correlating them to months. While they are describing the seasons, ask how long the seasons last and when they begin and end. Some examples of alternative calendars include:
    a. Lunar calendar: a calendar based on the phases of the moon. This calendar is widely used by Muslim cultures.
    b. Julian calendar: a precursor to the Gregorian calendar. Still in use by the Berber people in North Africa and some Orthodox Christian sects.
2. During calendar construction, participants will often mention key risk factors such as humidity, vector populations, grazing conditions, water scarcity etc. Thus, not only do calendars provide information on seasonality, they are also useful tools for identifying predisposing factors.
3. As with all PE tools, it is important to have a clear question in mind when conducting the activity and to write the question down in a notebook. Sometime the interest may be in the quantity of an indicator or the incidence of disease while other times importance of the indicator (or the severity of disease) may be the primary concern.
4. Seasonal calendars may be best used at a late stage in a study or interview after other methods have been used to determine meanings of local terminology for diseases. This will allow for more in depth probing of disease occurrence and help prevent misunderstandings when interpreting a seasonal calendar during follow-up data analysis.

5. When discussing risk factors such as vectors, it may be helpful to carry preserved specimens in clear bottles, or ask informants to collect specimens during the study. This will create interest and enthusiasm on the part of the livestock keepers.
6. Notes taken during the probing phase of the seasonal calendar activity should be written up as part of the "results" as these are important for understanding why the informants piled the counters the way they did.
7. As with other PE tools, it is nice to leave behind a copy of the calendar for the informants to discuss with other members of the community. This helps prevent the problems associated with extractive research techniques in which communities are not provided with feedback or results after a study is conducted.

Demonstration: Seasonal Calendars

Identify one or more participants with particular knowledge of a specific community and their language. Ask them to act the role of livestock keepers (informants) from the community and build a seasonal calendar as a demonstration.

Group Practice: Seasonal Calendar

Ask the participants to split into groups of 4 or 5 and practice making seasonal calendars. One participant will serve as the investigator, the rest as informants.

Each group should select a different livestock species that they are familiar with (cattle, sheep and goats, poultry, camels, etc.). The investigator should ask the informants about the five most important diseases affecting that species in their area. This may require a simple ranking exercise if more than five diseases are mentioned.

Next, the investigator should ask about perceived risk factors associated with each disease and select up to five risk factors that may have a seasonal trend. These may include movement of livestock for grazing, vector populations, cultural events or holidays, presence of wildlife, calving seasons, etc.

The groups should make a seasonal calendar starting with description of seasons in local terms followed by a description of the characteristics that define the seasons such as rainfall, temperature, etc. The seasonal calendar should be build using seasonal characteristics, disease incidence, and risk factors for disease spread.

Following the practice session, each investigator should present the group calendar to the other groups. Discuss what went well, what went wrong and what could be improved for next time for each group.

Presentation: Timelines

Many diseases of interest occur as epidemics at finite time points and endemic diseases may flare up at regular or irregular intervals. The interviewer may note the years of major epidemics for various diseases on an annual time line. Timelines are a useful tool for exploring the frequency of key disease events and patterns over time. They will also serve as a useful reference to triangulate the year of reports made by the community as a means of data verification. The dates reported by the informants can be compared to official reports from the local government surveillance system. Information on major events, such as droughts and famines or political events may also be included to assist informants in remembering the timing of key disease events. These dates can be verified using reports from local newspapers. In addition, these events may also have an impact on disease occurrence because changing movements and habits of animals and people. Their inclusion may allow for triangulation of reported risk factors for disease occurrence. Local names for events should be used as much as possible.

The scale of the timeline may vary depending on the issue of interest. For example, it could be 50 years of more for diseases with a long epidemic cycles such as RVF or rinderpest, three to five years for a disease which occurs more frequently such as ND, or just a few months or weeks if you are exploring events around a specific disease outbreak e.g. the new introduction of a disease into an area.

Benefits of using timelines in PE:

- They help to clarify the details of disease events mentioned by respondents because they prompt respondents to remember things that happened before or during the disease event.
- Timelines may also prompt respondents to remember additional information e.g. other disease outbreaks not already mentioned.
- Estimate the duration of events, e.g. disease outbreaks and how frequently they occur.
- Can show the cause-and-effect relationship between events, e.g. timing of heavy rainfall and occurrence of Rift Valley fever (RVF).
- Enable the surveillance team to involve communities in evaluating targets, e.g. how soon after a disease report should implementation of disease control interventions start.

Table 3: Example of a timeline prepared for the period 1999-2008 indicating key events in Uganda and key national or local livestock events

Year	General events	Livestock events
1999	Kabaka's wedding Congo war	Recruitment of vet graduates started CBPP influx from Congo
2000	Kanungu massacres Kisangani I and II Besigye declares political intentions	CBPP
2001	Presidential elections Signing of EA pact Ebola outbreak in North Uganda	PACE starts CBPP
2002	Bill Clinton visits Uganda Congo war ends	Uganda declared provisionally free of rinderpest CBPP
2003	Death of Amin (ex-president)	Decentralization of veterinary services
2004	Ebola outbreak in North Uganda Uganda withdraws from Congo Constitutional amendments	FMD
2005	Death of Obote (ex-president) Discovery of oil in Uganda Amendment of constitution Ebola	FMD, anthrax in QENP
2006	Presidential elections under multi-party system Floods in East and North Uganda	FMD spread reaches record levels, Anthrax in QENP (hippos died)
2007	Ebola in Bundibugyo Marburg outbreak in Western Uganda Uganda hosts CHOGM (Queen) Floods in Teso region Peace in Northern Uganda Balaio saga	FMD in E. Uganda, Uganda declared RP free by OIE *Peste des petits ruminants* (PPR) confirmed outbreak in Karamoja
2008	Budo inferno Obama elected US president Minister of State MAAIF Sebunya dies Kyabazinga dies	FMD, livestock census, Uganda declared free of rinderpest infection PACE ends

Method

1. Decide on the timeline scale based on the issue of interest (50 years, 10 years, 3 years etc.). Draw a line on the flipchart and indicate the years before present.
2. Ask the participants to indicate key events during the timeframe (events affecting the community, major livestock events and livestock disease events) and write the events on the calendar. Objects or pictures can be used to represent events.
3. Probe the timeline, e.g. *Has this disease ever occurred in this area before that year? Did anything different or significant happen in the few months or weeks before that outbreak?*

Handout: Seasonal Calendars

Temporal variations in disease occurrence are a common aspect of epidemiological investigation. Many animal health problems and issues show seasonal variation. Seasonal calendars are a useful method for understanding local perceptions of seasonal variations in disease incidence or risk factors for disease. A seasonal calendar can be used to visualize and analyze local perceptions of the seasonality of key farming practices, diseases, risk factors etc. The seasonal occurrence of diseases is interesting to understand in relation to the seasonality of these factors. New or unusual factors may emerge that are important in the particular area. The information can be useful for improving disease mitigation strategies such as timing of prophylactic vaccination or treatment. 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.

In order to be able to construct a seasonal calendar, it is first necessary to be familiar with local terminology and descriptions of seasons and how these relate to the months of the year. This information can be gathered from key informants. The seasonality of different events or activities of interest is then demonstrated by indicating the timing of occurrence or scoring occurrence in relation to the seasons.

Seasons are defined by different characteristics in different regions. In tropical areas seasons are often defined by the amount of rainfall while in temperate areas seasons are divided based on the temperature or length of day. Understanding the characteristic that are used to define the seasons in the area under investigation is the first step in creating a seasonal calendar. Then other seasonal events (indicators) can also be investigated. These may include:

- disease outbreaks
- availability of grazing pasture
- access to water
- presence of wild animals or birds
- presence of vectors
- movement of livestock
- calving seasons
- availability of animal housing
- prophylactic treatments such as vaccination
- buying in stock or off-take
- harvests
- festivals, holidays
- taxes or collection of other fees

Method

Based on information previously gathered in the interview, the interviewer should be familiar with local farming practices, common disease problems and the factors that may affect disease occurrence. From this information a list of indicators (diseases or risk factors) may be developed and the following method used to explore seasonality.

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1. Draw a line on the ground or at the top of a piece of flip chart paper and indicate that this represents one year.
2. Ask the informants to describe the seasons that they experience during the year. Record the local names for these seasons. Ask the participants to divide the line into seasons based on their occurrence and length during the year.
3. Label the seasons by either be writing them on cards or representing them with local objects or pictures. If the months of the year are commonly used, then write these along the line above or below the relevant seasons.
4. Ask the informants about a key indicator that defines the seasons in the area (rainfall, temperature, length of day, etc). Give them a pile of 20-30 counters and ask them to divide the counters between the seasons to show the relative association of the indicator with that season. All the counters should be used. Draw a line to create the first row of the calendar. Record the results but do not remove the counters.
5. Repeat this with each indicator (activity, event, disease) on a new line, using 20-30 counters each time, so that gradually a matrix is built up (see example in Table 1). The name of the indicator may be written on the flip chart or on a card and placed at the side of the matrix. For illiterate participants, a picture or object may represent the indicator.
6. Once the calendar has been completed, the results should be discussed with the informants using open and probing questions, for example: *Why is this disease more common in this season? Do you know what causes this disease? So this disease seems to occur when there is a lot of rain, is that correct?*

Table 1: Example of a seasonal calendar for cattle diseases in Maasai community, Tanzania (translated into English)

	J	F	M	A	M	J	J	A	S	O	N	D
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Peste des petits ruminants	ooooooooo									ooooooooo		
Anaplasmosis	oo		ooooooo			ooooooo				oooo		
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Foot and mouth disease	o		ooooooooo			o				ooooooooo		
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Tsetse flies	o		oooo			ooooooooo				oooooo		
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Alternative method: Timing of occurrence

This method simply indicates the presence or absence of an indicator by season rather than scoring, and therefore gives useful but less detailed information (see Table 2).

1. Draw a line on the ground or at the top of a piece of flip chart paper and indicate that this represents one year.
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Kawoya (ND)	■	■				■	■				■	■
Amabwa (Fowl pox)	■	■	■	■	■	■	■	■	■	■	■	■
Ehidukhano sio musayi (Coccidiosis)			■	■	■			■	■	■		
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Tips for Seasonal Calendars:

1. Not all cultures use the Gregorian calendar based on 12 months in a year (January – December). This is why it is important to start by asking informants to describe the seasons before correlating them to months. While they are describing the seasons, ask how long the seasons last and when they begin and end. Some examples of alternative calendars include:
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3. As with all PE tools, it is important to have a clear question in mind when conducting the activity and to write the question down in a notebook. Sometime the interest may be in the quantity of an indicator or the incidence of disease while other times importance of the indicator (or the severity of disease) may be the primary concern.
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5. When discussing risk factors such as vectors, it may be helpful to carry preserved specimens in clear bottles, or ask informants to collect specimens during the study. This will create interest and enthusiasm on the part of the livestock keepers.
6. Notes taken during the probing phase of the seasonal calendar activity should be written up as part of the “results” as these are important for understanding why the informants piled the counters the way they did.
7. As with other PE tools, it is nice to leave behind a copy of the calendar for the informants to discuss with other members of the community. This helps prevent the problems associated with extractive research techniques in which communities are not provided with feedback or results after a study is conducted.

Handout: Timelines

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The scale of the timeline may vary depending on the issue of interest. For example, it could be 50 years of more for diseases with a long epidemic cycles such as RVF or rinderpest, three to five years for a disease which occurs more frequently such as ND, or just a few months or weeks if you are exploring events around a specific disease outbreak e.g. the new introduction of a disease into an area.

Benefits of using timelines in PE:

- They help to clarify the details of disease events mentioned by respondents because they prompt respondents to remember things that happened before or during the disease event.
- Timelines may also prompt respondents to remember additional information e.g. other disease outbreaks not already mentioned.
- Estimate the duration of events, e.g. disease outbreaks and how frequently they occur.
- Can show the cause-and-effect relationship between events, e.g. timing of heavy rainfall and occurrence of Rift Valley fever (RVF).
- Enable the surveillance team to involve communities in evaluating targets, e.g. how soon after a disease report should implementation of disease control interventions start.

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2003	Death of Amin (ex-president)	Decentralization of veterinary services
2004	Ebola outbreak in North Uganda Uganda withdraws from Congo Constitutional amendments	FMD
2005	Death of Obote (ex-president) Discovery of oil in Uganda Amendment of constitution Ebola	FMD, anthrax in QENP
2006	Presidential elections under multi-party system Floods in East and North Uganda	FMD spread reaches record levels, Anthrax in QENP (hippos died)
2007	Ebola in Bundibugyo Marburg outbreak in Western Uganda Uganda hosts CHOGM (Queen) Floods in Teso region Peace in Northern Uganda Balaio saga	FMD in E. Uganda, Uganda declared RP free by OIE *Peste des petits ruminants* (PPR) confirmed outbreak in Karamoja
2008	Budo inferno Obama elected US president Minister of State MAAIF Sebunya dies Kyabazinga dies	FMD, livestock census, Uganda declared free of rinderpest infection PACE ends

Method

1. Decide on the timeline scale based on the issue of interest (50 years, 10 years, 3 years etc.). Draw a line on the flipchart and indicate the years before present.
2. Ask the participants to indicate key events during the timeframe (events affecting the community, major livestock events and livestock disease events) and write the events on the calendar. Objects or pictures can be used to represent events.
3. Probe the timeline, e.g. *Has this disease ever occurred in this area before that year? Did anything different or significant happen in the few months or weeks before that outbreak?*

Chapter 4k: PE Tools - Direct Observation, Transect Walks and Clinical/Post-mortem Exams

Objectives

By the end of the session, the participants should be able to:

- Understand the importance of direct observation during PE data collection.
- Understand and demonstrate the use of transect walks.
- Understand the purpose of conducting clinical and post-mortem exams and the etiquette of handling privately owned animals as a researcher.

Session Planning

- Discussion: Direct Observation in PE – 20 minutes
- Presentation: Transect Walks – 30 minutes
- Brainstorming: Transect Walks – 20 minutes
- Group Practice: Transect Walks – 40 minutes
- Presentation: Clinical and Post-Mortem Exams – 10 minutes

Total time: about 2 hours

Materials Needed

- Flip Chart Paper and markers
- Computer and Projector (optional)

Support Materials on Training CD

- Presentation – Transect Walks
- Presentation – Clinical and Post-Mortem Exams
- Video example of a Transect Walk
- Handout – Direct Observation – Transect Walks and Clinical/Post-mortem Exams

A Note about PE Tools

Numerous tools have been developed for use by the PE investigator to assist with communication. As mentioned in the introduction, these tools can be classified into three groups:

15. **Informal interviewing**: Semi-structured interviews, with key informants, focus-group discussions
16. **Ranking and scoring tools**: Simple ranking, pair-wise ranking, proportional piling, matrix scoring
17. **Visualisation tools**: Mapping, Venn diagrams, seasonal calendars, and timelines
18. **Direct observation**: transect walks, clinical and post-mortem exams.

Direct observation is used as a means of triangulating the information gathered using other participatory tools and techniques. It allows the researcher to visualize issues with his/her own eyes and creates a better understanding of the concepts being studied.

This module will cover tools of direct observation: transect walks and clinical and post-mortem exams.

Discussion: Direct Observation in PE

By this point in the training, the participants should have an excellent understanding of PE techniques and the benefits of using participatory techniques. Direct observation is a skill that most veterinarians and animal health workers develop during formal training. Now is a good time to discuss how observation skills can contribute to a PE study about livestock disease.

Give each participant 2 index cards and ask them to write on each one way that direct observation could contribute to a PE study. Collect the cards and group the responses by category. Attach the cards to the wall so that everyone can view them.

Next, ask the participants to discuss methods of direct observation that could be used in a PE study. Encourage them to think about the bias (see module called Introduction to PE) that may be introduced using the different methods discussed and ask them this bias could be mitigated.

An example might be diplomatic bias. A wealthy key informant may be interested in showing the researcher various aspects of the community but not include the poorest households because he/she feels it would be rude to expose their poverty to an outsider.

Presentation: Transect Walks

A transect walk is a tool that uses direct observation, informal interviewing and visualization to describe and show the location and distribution of resources, features, landscape and land use along a given cross-section of a village or area. A cross-section of the area of interest is observed by walking in a straight line (or as straight as possible) through a community in the company of key informants.

Transect walks can be used to:

- gain a physical sense of the environment and directly observe the daily activities of residents in a natural setting;
- identify and explain the cause-and-effect relationships among topography, natural vegetation, animal husbandry systems and other production activities and human settlement patterns;
- identify major problems and possibilities perceived by different groups of participants in relation to features or areas along the transect;
- learn about local technology and practices;
- triangulate data collected through other tools such as mapping; and
- probe the information that has already been mentioned by the community.

The transect walk should not coincide with the main road, but should start on one side of the area, cross the main road and continue to the other side. In the case of a village, the transect should begin at the limit of the village lands and walk straight forward, only deviating from this path when a physical obstruction (or cultural taboo) prevents direct passage to the opposite side. The idea is to directly observe production systems and community life, not just on the main street, but in the side street, back yards and a forgotten corner or two. The appraisal team should be accompanied by community members and should stop and ask questions of other residents as the need arises. Key informants should be selected based on their standing in the community, knowledge on local resources, and availability. If possible, both men and women should be selected as key informants to ensure gender sensitivity and balance.

For data recording, especially in rural agricultural areas, transects may be sketched in the profile form to illustrate relief features, land use, soil types, etc. Notes related to the various features are made directly below the profile. In more urban environments, sketching may not be necessary and direct notes may suffice. Narayan (1996) refers to these as ‘walking surveys’ and Chambers (1994) described them as ‘mobile interviews’. Transects can be time consuming but a lot of valuable information is missed by field teams that drive into an area on a paved road and drive out after an interview or questionnaire is administered. A wealth of information is available to a relaxed observer that takes the time to look around. This allows for a deeper understanding of the data gathered using other PE tools. Observations during the transect walk can be triangulated with information collected using other PE tools, especially the semi-structured interview and mapping activity.

Figure 1: The transect walk is an opportunity to observe conditions, build relationships and ask brief questions. Things to note include physical conditions, general health and well-being of the people and animals, and risky behavior or conditions.

The following are regarded as some of the strengths of this tool:

- Community members are able to demonstrate their knowledge of the local environment;
- Ability to corroborate informants' responses to questions;
- The researcher becomes familiar with the community members which may prompt them to be more open about the problems they face;
- Direct observation by the researcher allows for a clearer understand of these problems.

The following are regarded as some of the weaknesses of this tool:

- The presence of strangers in the community may bias normal activity;
- Key informants may guide the researchers to see 'highlights' of the community that do not represent the community as a whole;
- Expectations may be raised among the residents of the community without an opportunity to clearly explain the purpose of the visit;
- Some areas being studied may have poor security and be unsafe for the research team;
- Conducting an interview while walking and looking around may lead to delayed note taking and loss of data.

Method

1. Select and request that key informants guide you on a walk through the area to observe the daily activities and major sites in the community. Clearly explain that the purpose of the walk is to get a cross-sectional view of the community and that you wish to stay away from main roads, if possible.
2. During the transect walk, directly observe and note the area and community activities. Take time to stop at important sites such as markets and farms.
3. Interview the key informants as you walk. The questions may be prompted by what is observed on the way.
4. Stop and conduct short informal interviews with community members that are encountered along the way, when appropriate.
5. Construct a diagram of the community cross-section showing land use, livestock etc. and triangulate this with maps already prepared.

Tips for Transect Walks

1. Transect walks may be done at the beginning of an interview and provide a basis for probing during the SSI and inspiration on how to use other PE tools during the interview. Transect walks may be more useful at the end of an interview, however, so that key informants can demonstrate some of the topics that were raised during the interview.
2. There may be situations when a complete transect is not possible (e.g. inclement weather or there is too large of an area to be covered). In these scenarios, it may be helpful to conduct purposive walks to key sites recommended by key informants. Conducting a 'transect drive' may also be appropriate in some scenarios when a large area is being covered.
3. Explaining the purpose of the transect walk is a very important first step before the activity begins. Informants must clearly understand that everyday sites and activities are of interest and that main roads are fine but it is also desirable to observe hidden areas, including the poorest areas, of the community that demonstrate daily life.

Brainstorming: Transect Walks

What key activities, objects, or materials would be useful to observe during a transect walk?

Examples may include:

- Animal husbandry and housing
- Human housing and yards
- Relative wealth of the community
- Roads and waterways
- Commercial or individual farms
- Waste, hygiene and sanitation practices
- Markets
- Types of livestock and their general health status
- Meeting places
- Hospitals and health facilities
- Pharmacies
- Veterinary services
- Natural and other resources
- Land use and pasture

Group Practice: Transect Walks

Ask the participants to break up into groups of 4-5 people. Each group should plan a transect walk in the local area with a pre-determined objective. If possible, identify a key informant from the area to accompany the group on the transect walk.

Some examples of objectives:

1. To observe and understand the type of restaurants and food available in the local area
2. To observe and understand the means of transport used by people in the local area including the quality of the roadways.
3. To identify and understand leisure or recreational activities of the local community.
4. To observe and identify the types of vegetation in the local area.

If possible, during the transect walks the groups should stop and talk to informants along the way.

The groups should come together after 30 minutes to present their findings.

Presentation: Clinical and Post-Mortem Examination

Adapted from Mariner (2000)

In participatory epidemiology, clinical examination of representative cases is an important part of the triangulation process. An opportune time for conducting exams is usually directly after the semi-structured interview. Often the appraisal team will be asked to look at some sick animals during the interview and this can be deferred until after the interview is completed. The livestock owners can be asked to give their diagnosis for the cases presented, if they have arrived at one.

If they have not made a diagnosis or are not sure, do not press them to make a diagnosis. The information would not be significant. The fact that they have not made a diagnosis is the significant observation. They can be asked why they find the case confusing or have not reached a diagnosis. This may reveal factors used in the traditional diagnostic process and the level of experience that the informant has with livestock and livestock disease. If they have made a diagnosis, ask them for the basis of the diagnosis.

The clinical exam should be conducted using routine procedures. The animal's history should be taken and the herd should be examined or 'walked.' Always use appropriate precaution. Local breeds can be unusually nervous or aggressive. Be sure to consider the risk of zoonotic disease. Rabies and anthrax are common diseases in rural systems. Avoid oral exams in cases of apparent choke or excess salivation prior to ruling out rabies. In the case of some dangerous zoonotic diseases, such as highly pathogenic avian influenza H5N1, clinical and post-mortem exams are not recommended. In all cases in which a zoonotic disease is on the differential diagnosis list, appropriate personal protective equipment (PPE) should be worn by the investigator if an exam is to be pursued.

Occasionally, extremely ill or recently dead animals will be encountered with a history of interest. If possible, these should be autopsied. During autopsy, livestock owners can be asked to identify the various organs and describe their function, etc. They can also be asked to describe the lesions encountered. This provides information as to the type of lesions they recognise and the terminology they use to describe lesions. At times, ill animals of special epidemiological interest may be encountered which the owner does not wish to sacrifice. The team can negotiate to purchase the animal or the right to sacrifice, autopsy and sample the carcass from the owner. Invest time in the negotiation and avoid paying more than real market values. Paying exorbitant prices creates unrealistic expectations of future benefits from development activities.

Avoid distribution of free medicine as this perpetuates the psychology of dependence and creates false expectations. It is better to sell or trade, even if the trade is for something that the investigator does not want or need.

Clinical and post mortem examinations are the appropriate time for using field diagnostics and collecting samples for laboratory testing. Field diagnostics and laboratory confirmation are a key component of the triangulation process in PE. Photographs of clinically ill animals highlighting specific symptoms or lesions as well as post mortem photographs of characteristic lesions are additional methods to document information that can be used for reporting.

Figure 2 and 3: The photos depict buffalo pox in Sindh, Pakistan. The team was first shown the buffalo and inquired if the condition affected people. The farmers reported that women milking the buffaloes were affected. Many villages in Sindh are closed to outsiders and the women were asked to come to a gate and show their hands by the male members of their family. With patience and respect, PE practitioners can often find acceptable approaches.

Handout: Direct Observation – Transect Walks and Clinical/Post-Mortem Exams

Transect Walks

A transect walk is a tool that uses direct observation, informal interviewing and visualization to describe and show the location and distribution of resources, features, landscape and land use along a given cross-section of a village or area. A cross-section of the area of interest is observed by walking in a straight line (or as straight as possible) through a community in the company of key informants.

Transect walks can be used to:

- gain a physical sense of the environment and directly observe the daily activities of residents in a natural setting;
- identify and explain the cause-and-effect relationships among topography, natural vegetation, animal husbandry systems and other production activities and human settlement patterns;
- identify major problems and possibilities perceived by different groups of participants in relation to features or areas along the transect;
- learn about local technology and practices;
- triangulate data collected through other tools such as mapping; and
- probe the information that has already been mentioned by the community.

The transect walk should not coincide with the main road, but should start on one side of the area, cross the main road and continue to the other side. In the case of a village, the transect should begin at the limit of the village lands and walk straight forward, only deviating from this path when a physical obstruction (or cultural taboo) prevents direct passage to the opposite side. The idea is to directly observe production systems and community life, not just on the main street, but in the side street, back yards and a forgotten corner or two. The appraisal team should be accompanied by community members and should stop and ask questions of other residents as the need arises. Key informants should be selected based on their standing in the community, knowledge on local resources, and availability. If possible, both men and women should be selected as key informants to ensure gender sensitivity and balance.

For data recording, especially in rural agricultural areas, transects may be sketched in the profile form to illustrate relief features, land use, soil types, etc. Notes related to the various features are made directly below the profile. In more urban environments, sketching may not be necessary and direct notes may suffice. Narayan (1996) refers to these as 'walking surveys' and Chambers (1994) described them as 'mobile interviews'. Transects can be time consuming but a lot of valuable information is missed by field teams that drive into an area on a paved road and drive out after an interview or questionnaire is administered. A wealth of information is available to a relaxed observer that takes the time to look around. This allows for a deeper understanding of the data gathered using other PE tools. Observations during the transect walk can be triangulated with information collected using other PE tools, especially the semi-structured interview and mapping activity.

The following are regarded as some of the strengths of this tool:

- Community members are able to demonstrate their knowledge of the local environment;

- Ability to corroborate informants' responses to questions;
- The researcher becomes familiar with the community members which may prompt them to be more open about the problems they face;
- Direct observation by the researcher allows for a clearer understand of these problems.

The following are regarded as some of the weaknesses of this tool:

- The presence of strangers in the community may bias normal activity;
- Key informants may guide the researchers to see 'highlights' of the community that do not represent the community as a whole;
- Expectations may be raised among the residents of the community without an opportunity to clearly explain the purpose of the visit;
- Some areas being studied may have poor security and be unsafe for the research team;
- Conducting an interview while walking and looking around may lead to delayed note taking and loss of data.

Method

1. Select and request key informants to guide you on a walk through the area to observe the daily activities and major sites in the community. Clearly explain that the purpose of the walk is to get a cross-sectional view of the community and that you wish to stay away from main roads, if possible.
2. Duringthe transect walk, directly observe and note the area and community activities. Take time to stop at important sites such as markets and farms.
3. Interview the key informants as you walk. The questions may be prompted by what is observed on the way.
4. Stop and conduct short informal interviews with community members that are encountered along the way, when appropriate.
1. Construct a diagram of the community cross-section showing land use, livestock etc. and triangulate this with maps already prepared.

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ANNEX 1 – Example of a PE Introductory Course

Day One	Session
8.30 – 10.30	Opening and introductions Course objectives, programme, timetable, ground rules Expectations Questionnaire
10.30 - 11.00	Break
11.00 – 13.00	Surveillance systems
13.00 – 14.00	Lunch
14.00 – 15.30	Introduction to participatory epidemiology (PE)
15.30 – 16.00	Break
16.00 – 17.00	Introduction to PE (continued)
Day Two	
8.30 – 10.30	Review Traditional knowledge
10.30 - 11.00	Break
11.00 – 13.00	PE tools: semi-structured interviews and checklists
13.00 – 14.00	Lunch
14.00 – 15.30	PE tools: Ranking and proportional piling
15.30 – 16.00	Break
16.00 – 17.00	PE tools: Ranking and proportional piling (continued)
Day Three	
8.30 – 10.30	Review Mapping
10.30 - 11.00	Break
11.00 – 13.00	GPS Preparation for field practice
13.00 - 14.00	Lunch
14.00 – 17.00	***Field practice 1:*** semi-structured interviews
Day Four	
8.30 – 10.30	Review of field practice HPAI disease and differential diagnosis
10.30 - 11.00	Break
11.00 – 13.00	Sample collection and use of rapid test - theory
13.00 - 14.00	Lunch
14.00 – 15.30	Sample collection and use of rapid test - practical
15.30 – 16.00	Break
16.00 – 17.00	Personal Protective Equipment (PPE) – theory and practical

Day Five	
8.30 – 10.30	Review Data recording and analysis
10.30 - 11.00	Break
11.00 – 13.00	PE tools: timelines, seasonal calendars
13.00 – 14.00	Lunch
14.00 – 15.30	PE tools: matrix scoring
15.30 – 16.00	Break
16.00 – 17.00	PE tools: transect walk
Day Six	
8.30 – 10.30	Review PE tools: proportional piling – morbidity and mortality
10.30 - 11.00	Break
11.00 – 13.00	PE tools: disease impact matrix scoring Preparation for field practice
13.00 – 14.00	Lunch
14.00 – 17.00	***Field practice 2:*** semi-structured interviews and use of tools
Day Seven	
8.30 – 10.30	Review Reporting back, data handling
10.30 - 11.00	Break
11.00 – 13.00	Introduction to Participatory Disease Surveillance (PDS) PDS checklist and clinical case definition Preparation for field practice
13.00 – 14.00	Lunch
14.00 – 17.00	Field practice 3: PDS
Day Eight	
8.30 – 10.30	Review, reporting back, data handling
10.30 – 11.00	Break
11.00 – 13.00	Record keeping Data reporting and analysis
13.00 - 14.00	Lunch
14.00 – 17.00	Field practice 4: PDS
Day Nine	
8.30 – 10.30	Review, reporting back, data handling
10.30 – 11.00	Break
11.00 – 13.00	Risk mapping
13.00 - 14.00	Lunch
14.00 – 15.30	Planning for HPAI field work
15.30 – 16.00	Break
16.00 – 17.00	Planning for HPAI field work

Day Ten	
8.30 – 10.30	Review Checklists, reporting formats, sampling protocols
10.30 - 11.00	Break
11.00 – 13.00	Review, revision, finalisation of plans Closing
13.00 – 14.00	Lunch