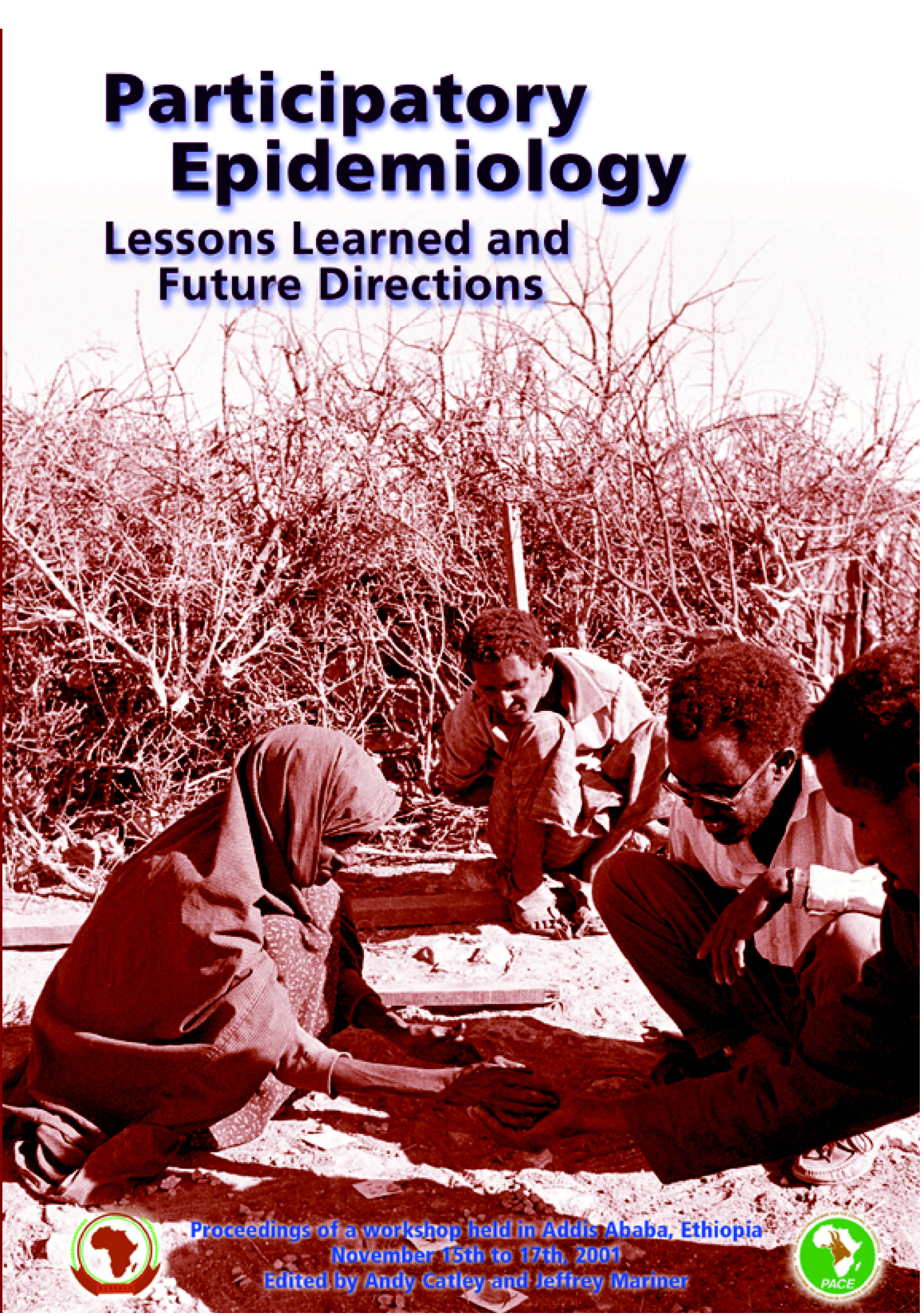
Participatory Epidemiology

Lessons Learned and Future Directions



Proceedings of a workshop held in Addis Ababa, Ethiopia
November 15th to 17th, 2001
Edited by Andy Catley and Jeffrey Mariner

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Contents

Summary

The Pan African Programme for the Control of Epizootics (PACE) aims to complete the final eradication of rinderpest from Africa and improve control of other epizootics diseases such as contagious bovine pleuropneumonia and foot and mouth disease. Experience has shown that disease control is particularly problematic in more remote arid and semi-arid areas inhabited by pastoralist communities. In regions such as the Horn of Africa, logistical and resource constraints are compounded by insecurity and in some cases, limited government presence.

Within the PACE Programme, the Community-based Animal Health and Participatory Epidemiology (CAPE) Unit supports the development of primary-level veterinary services in pastoral areas. The focus is on privatised, community-based delivery systems that are enabled through appropriate policies and legislation. CAPE also aims to complement conventional livestock disease investigation and surveillance methods through the wider application of "participatory epidemiology" (PE). Participatory epidemiology has evolved from the principles and methods of Rapid Rural Appraisal and Participatory Rural Appraisal, and provides opportunities to make best use of pastoralists' considerable indigenous knowledge on animal health while also encouraging community participation in disease control.

However, participatory approaches and methods are not widely used by epidemiology units within State Veterinary Services. This workshop was organised by the CAPE Unit to present recent developments in PE to senior veterinarians, academics and researchers in the Horn of Africa Region, and explore how PE might assist national PACE programmes to achieve their objectives. The workshop comprised a mix of presentations, discussion and working groups on key topics, and informal networking and exchange of experiences and ideas.

Recent developments in the use of PE by veterinarians with pastoralist communities in the region included studies of the reliability and validity of participatory methods, and the development of a disease model for rinderpest based on field data derived from PE. These experiences were useful for showing how PE can be combined with and complement conventional epidemiological approaches.

The main outcomes of the workshop were:

- Improved understanding of the potential roles of PE in veterinary epidemiology
- Raised awareness of important methodological issues affecting best practice of PE
- Widespread support for the wider use of PE in national PACE programmes
- Interest from veterinary schools for incorporating PE into either undergraduate or postgraduate teaching, and research activities
- Identification of PE training needs for veterinary and livestock workers at central and field levels

During 2002, the CAPE Unit will follow up training needs in national PACE programmes and support teaching and research on PE in veterinary schools and research institutes. The contents of an introductory training course on PE were presented and discussed during the workshop.

Abbreviations

ASF	African swine fever
CAHW	Community-based Animal Health Worker
CAPE Unit	Community-based Animal Health and Participatory Epidemiology Unit
CBPP	contagious bovine pleuropneumonia
FMD	foot and mouth disease
IIED	International Institute for Environment and Development
ND	Newcastle disease
OAU/IBAR	Organization of African Unity/Interafrican Bureau for Animal Resources
PACE	Pan African Programme for the Control of Epizootics
PARC	Pan African Rinderpest Campaign
PAVE	Participatory Approaches to Veterinary Epidemiology Project
PDS	Participatory Disease Searching
PE	Participatory Epidemiology
PRA	Participatory Rural Appraisal
RVF	Rift Valley fever
TOT	Training of Trainers

Acknowledgements

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The workshop was made possible by funding from the Department for International Development (DFID), United Kingdom to the CAPE Unit, PACE Programme, OAU/IBAR.

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Introduction

Background

Veterinarians in Africa have been using participatory approaches and methods since the late 1980s. Initially, experiences were largely derived from community-based animal health projects where PRA-type methods were used during project design. Soon after, 'participatory disease searching' evolved in the Pan African Rinderpest Campaign (PARC) as a means to trace rinderpest foci in remote areas. Over time, participatory methods have attracted increasing interest from veterinarians and are now used by a wide range of organizations. A survey of vets conducted with OAU/IBAR assistance in 1999 indicated that participatory methods were useful for developing good relationships with communities, understanding local knowledge and priorities, and were relatively inexpensive and flexible.

Within OAU/IBAR, two recent developments with the use of participatory methods are:

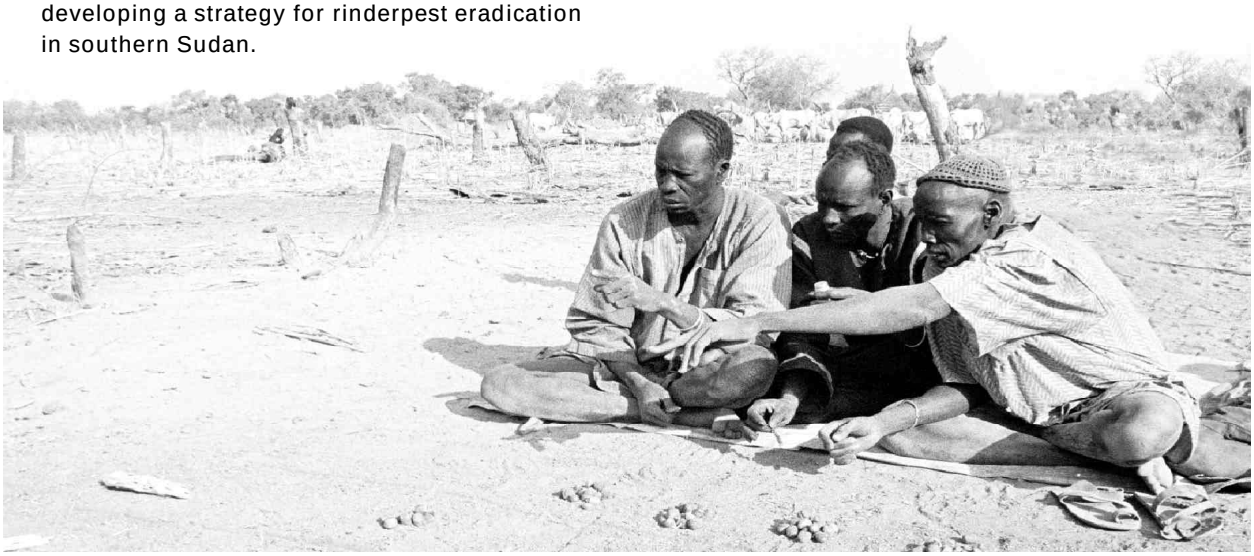
- The Participatory Approaches to Veterinary Epidemiology (PAVE) Project was implemented with the International Institute for Environment and Development (IIED) from 1998 to 2001, and focused on the reliability and validity of participatory methods. This research compared data derived from participatory inquiry with that obtained from conventional veterinary investigation methods, and also looked at options for quantifying 'participatory data'. Three studies were conducted in pastoral areas of southern Sudan, Kenya and Tanzania.
- In southern Sudan, participatory methods were used to generate data for a disease model for rinderpest. The model proved useful when developing a strategy for rinderpest eradication in southern Sudan.

Although many veterinarians are now using participatory methods, a number of issues remain open to discussion and further development. For example, while organizations such as IIED recommend training and field-level practice before using participatory methods, few veterinarians have been trained. Consequently, numerous methods are labeled 'participatory' but the principles and best practice of participatory inquiry are often overlooked. Another constraint is the pressure for academic researchers to publish in scientific journals, but the qualitative nature of participatory research is thought to prevent this. And finally, what are the opportunities for combining participatory methods with more conventional veterinary investigation and epidemiological methods in national PACE programmes?

Workshop objectives

The objectives of the workshop were as follows:

1. Obtain an overview of experiences with the use of participatory approaches and methods by veterinarians in the Greater Horn of Africa region.
2. Identify specific aspects of participatory methods in need of further research from a methodological perspective.
3. Define opportunities for the use of participatory methods by the Pan African Programme for the Control of Epizootics.
4. Make recommendations regarding 'best practice' use of participatory methods by veterinarians, including training needs.



Session 1

Overview of the origins, principles and methods of participatory epidemiology

Participatory Epidemiology: Setting the Scene

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Introduction

Simply stated, participatory epidemiology is the application of participatory rural appraisal techniques to the collection of epidemiologic information.

In the current era of globalisation, there is an increasing demand for animal health information. Internationally, the Sanitary and Phyto-Sanitary Agreement of the Global Agreement on Tariffs and Trade established science-based methods as the basis for livestock and livestock product trade decision-making. Countries are now required to provide data to substantiate their national animal health status relative to trade. This presents special problems for developing countries with remote and extensive agriculture systems. Remote and marginalized livestock populations are under-represented in service delivery and information systems. As a result, these populations suffer from the direct lack of services and pose epidemiologic risks to the national livestock population as a whole. The absence of current surveillance information on the animal health status of remote populations adversely affects export trade.
In the late 1980's Tufts University developed a thermostable vaccine against rinderpest and began implementation of a series of projects to introduce the use of the vaccine at both field and laboratory level as part of the OAU/IBAR Pan African Rinderpest Campaign (PARC). In the course of the rinderpest eradication effort, the need for alternative animal health delivery systems for remote, marginalized communities became apparent. This led to a programme of action research on community-based animal health delivery systems that included rinderpest control in a variety of communities in East and Central Africa. Nearly simultaneously, a major community-based animal health programme was set in motion by Tufts and Unicef to address the basic animal health and rinderpest vaccination needs of the communities affected by the complex emergency in southern Sudan.

As part of the process of designing these community-based programmes, participatory rural appraisal techniques were used to conduct needs assessments on animal health issues. The needs assessments focused on the following areas:

- Animal health problems and priorities
- Local veterinary knowledge and concepts
  - Disease vectors, reservoirs, epidemiologic understanding
  - Treatment
- Appropriate interventions
- Community structure, decision making and entry points

This information was used to formulate projects that directly addressed the perceived needs of the community through an appropriate combination of conventional approaches, local knowledge and community institutions. In the process, all those involved developed a tremendous respect for the extent of existing veterinary knowledge on the presentation and patterns of disease. This led to the identification of participatory epidemiology (PE) as an area of qualitative inquiry for further methodologic development and promotion as an appropriate technique for the rapid, effective, and economic collection of epidemiologic information.

Underlying concepts

Participatory approaches are founded on the philosophy that empowering beneficiaries to identify and overcome the challenges they are facing is the surest route to achieving sustainable development. The basic requirements for practitioners of participatory development are a respect for traditional knowledge, willingness to learn, and attitude of open-mindedness. The experts that apply participatory methods all come with technical educations and skills. The real value of these educations is not in providing universal models for development but in providing the tools to respond to new information in an innovative and constructive manner.

Participatory rural appraisal (PRA) is a qualitative intelligence gathering approach designed to rapidly

achieve a best-bet understanding of a situation as a basis for an action plan. It is a decision-oriented information collection and analysis process. A multi-disciplinary team of experts usually implements participatory rural appraisals. The PRA method provides a toolkit of techniques and activities that facilitate the exchange of information. The process is open-ended in that it allows the beneficiaries to provide direction to the information gathering process. This has been referred to as discovery and is based on the assumption that the appraisal team cannot and should not assume that they can anticipate all the issues and information that is important to understanding the situation. The process is participatory since the informants actually benefit from the information collection process. First, the data collection tools provide an opportunity for community self-realization through better visualization of their life and livelihood situations. Secondly, the information obtained though PRA is information for action that should result in interventions directly benefiting those who provided the data.

The participatory approach makes use of existing quantitative information and uses qualitative intelligence to fill the gaps between available data. It is perhaps important to note that quantitative data and the statistical methods used to analyse quantitative data cannot establish casual relations. They merely establish the probability of association between factors. It is in fact other qualitative information that is used to determine casual relationships and essential to the correct interpretation of quantitative data.

In the developing world, the high cost, complexity and lack of flexibility associated with quantitative studies has meant that the availability of quantitative data is very limited. In fact, the very scarcity of quantitative data implies that the data is not representative and has often meant that the information resulting from such studies is misleading.

The method of sampling in PRA studies is based on the principal of key informants rather than randomisation. The study actively seeks individuals who are likely to have specialized knowledge or a uniquely informative perspective on the issues under study. In the case PE, the study team actively seeks out livestock owners and traditional healers who are respected for their ability relative to animal health. Other types of key informants are traditional elders and community leaders who are directly involved in decision-making processes and have some authority to speak for the group. Finally, veterinary professional, international experts and individuals with expert knowledge about the sociology of the groups under study are frequently consulted.

The way qualitative data is assessed and validated is fundamentally different from quantitative data. In the quantitative world, statistics are used to calculate the probability that randomised information and associations are valid. Validation in the qualitative approach is based on weighing of evidence from diverse sources. This may include information derived from quantitative or laboratory-based testing. But PRA can make use of broader forms of experiential knowledge and information such as oral testimony and observations from samples of non-random key informants.

The tools of participatory epidemiology

Participatory epidemiology utilizes the PRA toolkit of methods. These methods may be grouped as secondary sources, direct observation, interview techniques, visualization techniques and methods of ranking and scoring.

Secondary sources

Secondary sources refer to existing literature, reports, maps and databases on the communities and issues under study. All good PRA studies begin with an inventory of secondary sources and a review of these sources.

Direct observation

The techniques of direct observation refer to observing the environment and daily activities of livestock owners. One of simplest starting points is to get out and walk through the village or cattle camp and surrounding pasture. Observe the condition of the people, livestock, housing and pasture. Note what plants are present. Try to be present for production activities like milking and note who is carrying-out the tasks and how they are completed.

Semi-structured interviews

One of the main tools of participatory epidemiology is the semi-structured interview. In semi-structured interviews, a checklist of subjects to be covered is used as a point of reference rather than a questionnaire. The interview team makes use of open-ended questions to allow participants the opportunity to introduce topics and issues. For example, after introductions, an opening question might be "What are the problems with your livestock?" As the participants introduce topics, probing questions are asked to obtain more detail and check information for internal consistency.

Visualisation techniques

The visualisation techniques include approaches such as map, Venn diagram, timeline and seasonal calendar construction. Mapping usually involves clearing an area of sand and sketching with sticks the relative location of key resource and strategies used by the community. This includes things such as grazing areas, cultivation areas, water sources, salt sources, woodlands, wild foods, wildlife, habitat of insect vectors of disease, friendly and unfriendly neighbours, trade routes, seasonal movements, and emergency movements. Using this approach, the appraisal team can very quickly obtain an overview of the area and the spatial distribution of key resources. In epidemiology, the spatial relationship between communities, their social relations and movement patterns go a long way towards determining livestock contact patterns and are key to understanding the epidemiology of infectious disease. Timelines and seasonal calendars are very powerful tools for describing the temporal patterns of disease in a location.

Ranking and scoring methods

Ranking and scoring refers to a group of techniques used to prioritise information or provide semi-quantitative estimates of the relative size or impact of categories as perceived by the participants. In ranking, the respondents are asked to place items in their order of priority. For example, if 5 diseases have been mentioned as problems, the interviewer requests that they be listed in order of importance. A more systematic alternative is pair-wise ranking where the respondents are asked to identify which is the more important disease of each possible combination of two diseases from the list. Proportional piling is very flexible technique in which respondents are asked to divide 100 objects such as seeds or stones into piles of sizes representing the relative size or importance of different categories. The number of objects in each pile is then counted to give a score. These exercises can be repeated in subsequent interviews and the results analysed statistically.

Data validation and analysis

In the process of data collection, the use of probing questions is an important quality control tool to assess the internal consistency of reports. Once a body of information is obtained from a series of interviews and data collection exercises, the information can be assessed through the process of triangulation. The term triangulation simply means comparing information obtained from multiple informants and multiple methods to look for patterns. If the information suggests a uniform conclusion then the interpretation is relatively straightforward. Occasionally, different groups of key informants may provide conflicting information. The study team must then consider how the differing perspectives of the informants impact the information obtained.

An important advantage of PE that provides a high degree of flexibility is iterative analysis. As the data is gathered, the study team can review the information available and refine the study hypotheses. They have the opportunity to include new questions or data collection exercises as a result of information discovered during the PRA process. A further form of analysis is participatory analysis. Once the study team feels they have a reasonable best-bet scenario that describes the situation, they can present that scenario back to the participants. The participants can then add, subtract or clarify information in the best-bet scenario.

Applications of participatory epidemiology

As was mentioned in the introduction, PE was first developed as a project needs assessment tool. It has also found application in animal health project monitoring and evaluation. The techniques can be used to track changes in disease impact over time as well as to collect the perceptions of beneficiaries and other stakeholders on the impact of the project, weaknesses and possible ways to improve performance.

Perhaps more importantly, PE has important applications as an epidemiologic surveillance tool in its own right. Participatory epidemiology has been adapted as a very successful method of targeted surveillance for rinderpest. In fact, a few low cost and relative sort-term PE studies have dramatically altered the conventional wisdom regarding the mechanisms of endemicity and spatial distribution of rinderpest in East Africa. This approach has been termed participatory disease searching (PDS).

Participatory disease searching

In PDS, the disease search team is interested in information on a specific disease but takes precautions not to communicate this interest to respondents. Questions are asked about general animal health concerns. If the target disease is identified as a problem, probing questions can be asked about the target disease in combination with other subjects. The investigation seeks to establish the history of the disease in a community and trace reports forwards and backwards in time. Often, herders guide the disease search team to active cases of disease that can then be confirmed by laboratory diagnostic methods. An example of a form of timeline, a bar chart illustrating rinderpest reports by from Somali herders, is presented in Figure 1. Note that Figure 1 illustrates the principal of triangulation. All the available independent reports form a coherent pattern with an inter-epidemic period of about 5 years.

Another promising application of PE is in the general disease surveillance. Community-based animal health programmes are in place in a number of countries and in some countries more than one thousand community-based animal health workers (CAHWs) are active. These programmes are important animal health information networks. Programme monitors debrief and re-supply CAHWs on a more or less monthly basis. The CAHWs are aware of major disease outbreaks and are a source of information about trends in endemic disease. Several appropriate techniques of sample collection such as dried blood on filter paper have been developed for both serological and genetic analysis. At present national disease surveillance systems have yet to create a framework to adequately utilize this important and sensitive source of disease information.

Efforts are now underway to combine participatory epidemiological approaches with more conventional forms of analytical epidemiology. To this end, the Community-based Animal Health and Participatory Epidemiology (CAPE) Unit has been supporting the use of PE as a method of collecting expert opinion for use in infectious disease modelling. Also, studies have been completed by the PAVE Project to validate existing veterinary knowledge as a form of epidemiologic data. The results of this work suggest that combinations of both participatory and analytic techniques yield an extremely powerful approach to the study of epidemiology.

Livestock keeping and indigenous knowledge in the Horn of Africa: Personal reflections on 25 years experience

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This paper focuses on one aspect of pastoralists - the ethnoveterinary knowledge (EVK) which has enabled them to scrape a living from a climatically hostile ecosystem for ages. The vehicle of survival has mainly been livestock keeping and the accumulated quantum of traditional knowledge is based on this livelihood. The paper goes on to highlights specific examples of EVK that pastoralists have acquired from time immemorial and recommends that veterinary epidemiologists open their attitudes in order to tap this EVK from pastoralists. This is particularly important during the last stages of rinderpest disease control and that is at the surveillance and disease search stages.

Introduction

The Horn of Africa is home to around 20 million pastoralists. In general, pastoralists' areas are places with unique characteristics that have produced unique constraints among its inhabitants (see Box opposite). It is these constraints that have hardened the inhabitants of these areas to withstand the rigors of harsh environmental conditions. When outsiders come to the Horn they are bound to complain of the harsh climate and wonder how the inhabitants can live with their livestock quite comfortably. In contrast, the real pastoralist finds everything normal because he or she has known no other environment since childhood. They have accumulated vast traditional knowledge and experience on the tactics of survival in these environments. That is why pastoralists are experts on issues of livestock keeping in their environments. To them, livestock keeping is the most reliable livelihood as it offers them the most successful coping strategies for survival. It is however unfortunate that most outsiders coming to the pastoral areas are not aware of the existence of such EVK among pastoralists. Some veterinary epidemiologists belong to this category.

The unique characteristics of the pastoralists areas

1. Harsh climate and rugged topography.
2. Remote, largely inaccessible by road and distant from public-and private-sector centralized services.
3. Movement in search of pasture and water is key to survival (satellite camps or kraals at Awi ; home site - Ere)
4. The pastoralists are often branded "unwilling to change" but they cannot afford the luxury of experiments offered by the outsiders.
5. Maintain traditional structures, - pillars of decision-making.
6. They have complex decision making processes
7. Suffer from colonial and post colonial isolation - marginalization
8. Still hanging on dependency syndrome of handouts and this has slowed down privatization efforts.
9. Insecurity due to civil conflict and the deadly cross-border raids.

The weakness of veterinary epidemiology in pastoralists areas

As noted above, many veterinary epidemiologists are not aware that pastoralists are well equipped with very valuable EVK and are unwilling to learn from these local experts. There are many reasons for this lack of awareness, but the most obvious is that they have not been formally trained in their institutions of learning about the pastoralists and their unique EVK. Worse still, they have not had any opportunity to learn it themselves in the field since most of them are not willing as pointed above. The question is why have they not taken the trouble to tap this knowledge among pastoralists and yet these livestock owners are so vital in the epidemiology and the eradication of livestock diseases in the Horn of Africa?

- One obvious reason is that most veterinary professionals come from outside the pastoralists' areas and they are therefore not keen to come closer to the pastoralists. They generally have negative attitudes towards these people.
- The other reason is that veterinary epidemiologists are trained to work with

sedentary herds using conventional approaches. They cannot accommodate the dynamics of pastoralists' areas and lack the inherent flexibility required to work in such areas.

- The veterinarians cannot therefore reach the traditional knowledge system (EVK) that is embedded in the cultural matrix of these people.
- These factors have contributed to the poor performance of veterinary service delivery in these unique areas, thus exacerbating the marginalization of the pastoralists.

These factors will continue to impact negatively on the surveillance stage of disease control programs.

Ethnoveterinary knowledge among pastoralists: some examples

Wherever they exist in Africa, pastoralists have tried to devise ways of living in harmony with their harsh environment. Broadly speaking these ways are many and diverse, and continue to be changed with time and with new challenges. A few examples of these traditional knowledge systems are given below.

Expert knowledge on range ecology

Pastoralists have learnt how to manage their fragile ecosystem. Despite the fact that they have been accused of causing widespread overgrazing and mismanagement of their production system, they are pleading innocence until proven guilty. This is because they are very knowledgeable about their land forms, soil and pasture types, and they know the capacities of their wells and most of the watering points. Knowledge about salty pastures, red or black soils found in rolling plains or at the shoulders of hills are examples of their ability to closely observe their ecosystems. In addition, pastoralists have designed grazing patterns that take into account the production capacity and the dynamics of their ecosystem for any given season.

One of the elements of a grazing pattern is movement. To a pastoralist and contrary to popular belief, nomadism is not haphazard but is a calculated response to cope up with hostile changes in one part of the grazing areas. It is a survival coping strategy that has developed with time. In the final analysis they are capable of managing their production system without damaging it. In fact, they accuse outsiders as the main cause of environmental degradation in pastoral areas. Pastoralists have devised even seasonal calendars for specific areas and use the stars to tell the beginning and end of a season. In addition, stars help them to foretell the severity of an impending drought!

Experts in obstetrics and animal reproduction

The most valued item in livestock keeping among pastoralists is milk. Pastoralists begin talking about milk the very day a cow is serviced by a bull. They know the pregnancy periods of all their domestic animals and they take care to monitor the days of pregnancy for each cow or camel. For example, a Turkana pastoralist knows that the gestation period for a camel is thirteen lunar months. He knows this from years of patient observation. And to make sure he does not forget when to start getting milk, each month that passes is recorded with a line drawn on the head stool until the thirteen lunar months have passed and the pregnant camel calves down.

Correcting cases of infertility

The reproductive capacity of any given animal is observed with keenness. For instance the anoestrus cows are taken to salty pastures for grazing. To a Turkana pastoralist, the salty grass will replace the missing salt and minerals which could include the phosphates. Pastoralists report positive responses as most of the cows returning from akicuar (meaning to quench the thirst for salt) actually come back pregnant. Some pastoralists also perform a surgery on the clitoris of heifers that have failed to become pregnant. When the tip of the clitoris is cut off slightly, the heifer is stimulated and eventually gets pregnant when served. It is not known as yet what happens but it is popular management of heifer infertility among most pastoralists.

Assisting calvings

All pastoralist know in one way or the other to help their cows to calve down. But at the same time there are people whom each community recognizes as the experts in handling the most difficult obstetrical cases. These are often consulted using a traditional fee.

Ability to communicate clearly

Most pastoralists are good orators but in any tree-of-men (Ekitoengikiliok in Turkana; Kokwo in Pokot) there are always expert communicators that the community has recognized as talented orators. These are the people who will be given the responsibility of repeating the discussion that goes on in the tree-of-men so that everybody will get the message clear and loud. This is a traditional skill which is unique to pastoralist communities and should be taken seriously by outsiders attempting to work with these communities.

Knowledge about pastoralist home economics

It is the pastoral woman who is the authority when it comes to the matters of food production in a pastoralists household. She has acquired the skills of an ant that gathers and stores during times of plenty to be used when things go bad. For instance most pastoralist women are skillful in drying milk during the wet season when there is surplus production. That powdered milk will be fed on mainly children when the drought becomes severe. Similarly some milk is cooked into ghee for use later. The desert fruits are also dried for the same purpose. The Somali women are particularly well known for preserving camel meat into nyirinyir (minced paste). It is a delicacy for Somali men and it adds love for his wife.

Livestock disease perceptions and etymology among pastoralists

A few examples are given to illustrate the livestock disease perception and etymology as given by various pastoral groups.

Blackquarter

This is a livestock disease that is recognized and accurately described by most pastoralists and agro-pastoralists. The Turkana pastoralists, call it lokichuma which literally means 'piercing pain' (from akicum meaning 'to pierce'). The description was borrowed from human feelings as the Turkana pastoralist watched, with imagined pain, the limping of the sick cow. The Fulani of Cameroon call this disease labba meaning the 'Devil's spear'. The Fulani believe that the lesion which causes the sick animal to limp came as a result of the animal being pierced by the Devil's spear which pierces the heavy muscles without physically cutting the hide. Similarly the Afar of Ethiopia name this disease harraymude where harra means 'forequarter' and mude means 'to pierce or to spear'.

Rinderpest

Rinderpest is a livestock disease that can cause very high mortality. The disease is endemic in specific inaccessible pastoralist areas in the sub-Saharan Africa. The names given to rinderpest by the various cattle keeping communities tell very vivid stories that can be very effective tools for awareness creation.

The Turkana give the traditional name for rinderpest as *lokiyo or loleeo*. The two names were derived by the Turkana pastoralists as follows. *Ngakiyo* in English means 'tears' and *lokiyo* denotes a livestock disease manifested by copious lacrimation and nasal discharges, involving very many cattle in herd and easily spreads to other neighboring herds in an outbreak fashion. It is the widespread lacrimation signaling a catastrophic episode or plague that stimulated the coinage of the name. The plague often involved not only cattle but even buffalo herds. In this case, when herders notice emaciated buffaloes they move their cattle away to avoid the disease. *Loleeo* is borrowed from their neighbours, the Karamojong, where that word means 'malicious'. The Turkana use the word to describe a unique type of pipe-stem diarrhoea which is watery and greenish brown.

The Fulani of Cameroon call rinderpest *pettu* which they like to a strong wind that destroys a lot of fruits when it passes through a laden mango or apple tree. The picture paints rinderpest as being capable of blowing through cattle herds, leaving them dead. The Afar of Ethiopia, call rinderpest *degahabe* which means 'empty kraal' - it comes from the expression *geso foyas habe* which means 'the kraal of cattle is empty'.

The Dinker Rek and Dinker Boor of southern Sudan call rinderpest *awet* or *nyan tek*. The word *awet* comes from wet piny, which in Dinka Rek means to scatter down like a hen that scatters the sorghum grain when it is fed in a container. The older Dinka compared this observation to a disease, which scatters down cattle. The Dinka Bor called it *nyan tek* meaning 'one calf remains'. This indicates the manner in which rinderpest kills all the cattle, leaving only one or a few animals to become immune to the disease.

The Latuko of southern Sudan give to rinderpest the name *lopirit*. This is derived from the word *pirit*, referring to the speed at which a fluid is emitted. When the expression is used to describe a disease in cattle, it refers to projectile emission of watery faeces.

All the above people are aware of the presence of modern vaccines and admit that they have no treatment of their own. However, they do have sophisticated quarantine procedures, which they put into effect during outbreaks.

Trypanosomiasis

The disease is common in many pastoral and agro-pastrol areas. The main vector being the tsetse fly though biting flies contribute by mechanical transmission. This protozoan disease affects all domestic animal but the examples given here are mainly from cattle.

The Turkana of Kenya and the Toposa of southern Sudan call trypanosomiasis in cattle *lokipi*. The name comes from *ngakipi* which means 'water'. This

word describes the disease of cattle which is characterized by widespread oedema in the body of the affected animal, during the final stage of a wasting condition. The carcass literally quenches fire and releases a lot of smoke when roasted.

The Didinga and Latuko of southern Sudan call trypanosomiasis *lobi*. The word *lobi* in the two tribal groups describes gradual loss of body condition of the affected cow. The disease is spread by the tsetse fly (called *lolir* in Latukol and *ikirongit* in Didinga).

The Nuer of southern Sudan call trypanosomiasis *liey/guaw* and they derive these two names from *liy* meaning stealing slowly, like something is secretly removing something from inside the animal which becomes thin. *Guaw* is a cattle disease characterized by gradual loss of condition, periodic fever, sunken eyes, lacrimation and photophobia. Frequently these animals seek shade and have hair loss in from their tails.

In nearly all cases the pastoralists have been exposed to modern trypanocidal drugs, such as ethidium bromide. They associate the effectiveness of these modern drugs with their local terms for trypanosomiasis , thus indicating they are correct in their diagnosis. There is some evidence that the local names which describe wasting diseases (e.g. in southern Sudan) may in fact be a combination of several diseases such as combined infection of liver fluke with trypanosomiasis.

Disease diagnosis and use of traditional remedies

These few examples of livestock disease perceptions by the pastoralists show that pastoralists are very good in diagnosing livestock disease entities in their traditional way. In fact, when discussing the Turkana classification of livestock diseases Ohta (1984) stated that *"They classify the conspicuous uncommonness visible on the animal".* In other words the Turkana identify what they believe are defining symptoms and name the disease accordingly. It is after diagnosing that they indicate traditional remedies for these disease entities. All pastoral groups in sub-saharan Africa express this ability with pride.

In both East and West Africa traditional medications are well known and discussed freely. For instance the Fulani known as the WodaBee in Niger and the Taureg in Niger are skillful in vaccinating their cattle against contagious bovine pleural pneumonia (CBPP) by placing a piece of infected lung from a cow that has died of CBPP into a fold of slit skin on the side of the nose of cattle to be vaccinated (Stem, 1996).

Conclusions

As indicated above, pastoralists have accumulated a vast amount of traditional knowledge that has enabled them to utilize livestock keeping as a viable livelihood. It is now up to us to open ourselves to tap this EVK in order to enrich modern epidemiology. This will entail a complete change of attitudes on our side as professionals and a move closer to the grassroots where the custodians of that knowledge reside. It means we have to reseek the people, accept nomadism as a coping strategy for survival rather than viewed it as unnecessary loitering by those people, that we become flexible and broad minded instead of being the rigid veterinarians that we have been accused of, and that we should be prepared to learn the livestock disease perceptions of the livestock owners and the way disease names are derived from the socio-cultural backgrounds. This is particularly important at the last stages of rinderpest disease control and that is at the surveillance and disease search stages. Pastoralists ability to identify and describe accurately the livestock diseases will be a real asset. This is because this people will hardly miss a case!

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Session 2

Issues affecting the wider use of participatory epidemiology

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Introduction

This session was introduced by reference to a survey of veterinary uses of participatory appraisal in Africa conducted in 1998-1999[1].
The survey targeted veterinarians and used a questionnaire to assess:

- Understanding of participatory approaches and methods
- Veterinary uses of participatory methods
- Perceptions on strengths and weaknesses of participatory methods

The questionnaire was administered to Directors of Veterinary Services, PARC National Coordinators, Deans of African veterinary schools, veterinarians working with major donors, NGOs, research centers and international agencies. The response rate was 28.6% (50 responses from 175 questionnaires administered). Response rates varied from 15.6% from government-employed veterinarians to 47.6% from veterinarians employed by NGOs. Some of the results were presented as summarized below.

Table 2.1
The main advantages of participatory appraisal as perceived by veterinarians working in Africa

Advantages	Number of times advantages cited
Aimed at community priorities and context	23
Inclusive; includes all social groups in the community	12
Improves relationships, trust and rapport between outsiders and communities	11
Rapid	10
Results reached and decisions made by consensus	8
Inexpensive because uses local resources	7
Encourages community-level problem solving	5
Promotes indigenous technical knowledge	5
Increase local, community ownership of projects	5
Enables outsiders to learn about communities	5

Table 2.2
The main disadvantages of participatory appraisal as perceived by veterinarians working in Africa

Disadvantages	Number of times disadvantages cited
Time consuming	17
Generates qualitative data	11
Requires high resources	9
Language/translation problems at field	8
Requires much patience on the part of the facilitators	5
Manipulation by project to achieve it's own aims	5
Seen as a panacea data collection method by donors	4
Requires very skilled facilitators	3
Unpopular with central decision-makers in government	3
Improper use of tools	3

[1] Catley, A. (1999). The use of participatory appraisal by veterinarians in Africa. Office International des Epizooties Scientific and Technical Review, 19 (3), 702-714.

Table 2.3
The main constraints to the use of participatory appraisal by veterinarians working in Africa

Constraints to usage	Number of times constraints cited
Lack of financial resources	13
Lack of suitable training courses	13
Lack of time to attend training	12
Poor acceptance and negative attitudes among veterinarians	6
Lack of relevant literature and training manuals	4
Logistical problems	3
Lack of forum to share experiences	3
No facilities to cross-check data using conventional means	2
Poor public awareness of the approach	2
External constraints e.g. conflict, food shortages	2

It was suggested that a number of issues arising for the survey should form the basis for further discussion by workshop participants. These issues were:

Issue 1 The use of qualitative versus quantitative methods
Issue 2 Methodological issues
Issue 3 Training and learning issues

Issue 1
Qualitative versus quantitative methods

To discuss this issue, participants were divided into five working groups and each group was asked to identify the strengths and weakness of qualitative, quantitative and combined qualitative-quantitative methods. The results from the working groups are summarized in Table 2.4 opposite. The facilitator expanded on some of these points as follows:

Quantitative methods

- Quantitative methods assume that the world can be described using facts that are discovered using objective research. The approach focuses on instrumental knowledge
- Objective, quantitative research is based on methods that separate the object of inquiry from investigating subject
- This requires a complex world to be compartmentalised into manageable units, which can be controlled, manipulated and studied.
- Judged according to four main criteria viz. internal validity; external validity; objectivity and reliability
- Issues of validity and reliability are usually addressed at the design stage of the research, using techniques such as random sampling, selection of appropriate sample sizes and use of controls. This approach enables the use of probability statements to describe associations in large populations.

In the 'hard science' establishment, quantitative methods are strongly associated with 'good science'.

Qualitative methods

- In comparison with quantitative research, qualitative research often aims to understand relationships in a specific, often localised context.
- Therefore, qualitative research does not seek to extrapolate research findings to a larger population.
- Often aims to understand critical or interactive knowledge.
- Uses inductive research methods; sources of error cannot always be predicted at the onset.
- Validity based on triangulation of data - comparison of results arising from different methods and informants.
- Validity is highly dependent on the skill of the researcher and their capacity to cross-check information as it emerges.

Table 2.4
Working Group perceptions of quantitative and qualitative methods

	Strengths	Weaknesses
Quantitative	Reliable and repeatable Statistical tools well-developed Proven, well-tested methods Technical qualified people available Widely accepted by decision makers, policy makers and academics Objective Auditable Allows direct comparison Representative Easy to interpret and extrapolate More in-depth statistical analysis Defined methods available to test specific questions More accepted as "proof"	Expensive and boring Long time frames required Difficult to sustain Requires a lot manpower Highly trained people Logistically difficult Techniques can be used inappropriately Less flexible Not easily understandable Feedback to communities difficult Limited attention to indigenous knowledge Less community involvement/ownership Interpretation difficult without background qualitative information
Qualitative	More participatory More sustainable and interesting Multidisciplinary and multidimensional More information than numbers alone Quick Better for feeding back to people; supports quick implementation of findings Indigenous knowledge Individual observations from local knowledge has significant Demands few resources Community and interviewer gains from process Discover unexpected, useful information Takes care of farmer circumstance Establishing ownership Broad issue Understand remote communities More sociality acceptable	Subjective Not accepted as a strong method e.g. by decision makers Requires trained people Transaction concerns Difficult to audit Difficult to quantify information Need of local knowledge and language Analyses tools not well developed Standardization often poor Lack of best practice rules Not everyone can do PRA (even when trained) May lack repeatability and comparability Lack of awareness of participatory methods among policy makers other stakeholders
Combination	More reliable More sustainable Less manpower Broader participation More realistic - most of time this in fact happening Can help to rule out weaknesses of qualitative and quantitative approaches More acceptable by donor countries More accepted by community and people improved "Best of both approaches" Allows participations of different types of expertise More verification possible	Expensive Required long-term commitment and resources

Issue 2
Methodological features of participatory inquiry

This session focused on three aspects of participatory epidemiology which are commonly misunderstood.

Confusion with questionnaires

Some workers consider the methods of participatory epidemiology to be "just like a questionnaire". However, an important influence on the development of participatory methods was dissatisfaction with questionnaire surveys among development workers. Questionnaires were often difficult to design and administer, and were based on the priorities and perceptions of researchers, rather than local people. Although best-practice guidelines for using questionnaires were available, they were rarely followed. For example, pretesting of questionnaires was often overlooked and the problem of non-sampling errors was usually ignored. Possible confusion over use of language, particularly translation of technical terms, was another issue.

In remote areas, pretesting of questionnaires can be logistically difficult and time consuming. Similarly, after the administration of questionnaires and collection of data, the analysis is often conducted back in the laboratory or office. This means that if discrepancies or unusual information arises during the analysis, it is difficult to verify the original data.

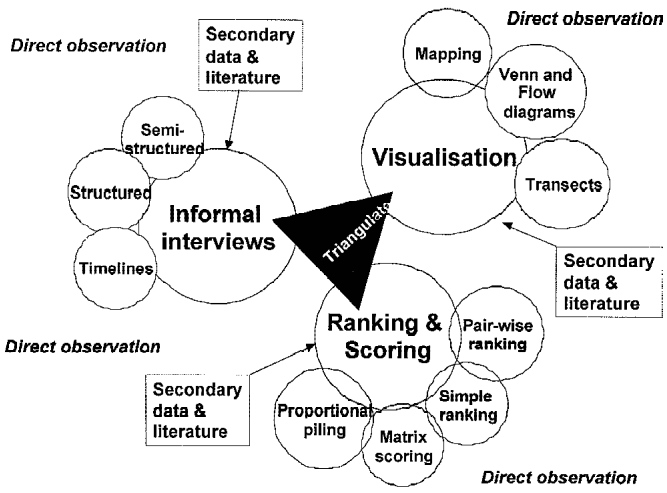
In part, participatory inquiry attempts to overcome some of the problems of questionnaires. Typically, local priorities are discussed using local language and disease terms. The overall approach is not to ask standard questions to a set number of people, but to explore and analyse issues and follow-up interesting leads. In other words, the approach is open-ended and flexible.

Triangulation

An important feature of participatory epidemiology is the use of different methods with different informants. Some of the most commonly used methods are summarised in Figure 1 and comprise three main groups - interviewing, visualization and ranking (and scoring). These three groups of methods are complemented by reference to secondary sources (reports, literature) and direct observation in the field. Information derived from all these sources is then combined and cross-checked to build a picture of the issues under investigation.

This process is similar to clinical veterinary inquiry. When visiting a farm, a veterinarian observes the conditions on the farm and the animals, and cross-checks these observations with information provided by the farmer. Similarly, when examining sick livestock the clinician is constantly comparing what is detected visually (or with a thermometer or stethoscope) with the description provided by the livestock keeper. As the investigation proceeds, samples might be taken for laboratory tests. Therefore, a combination of direct observation, owner interview, clinical examination and laboratory tests help the veterinarian to reach a diagnosis - this is an example of triangulation. In participatory epidemiology, triangulation is important because it helps to ensure the validity and reliability of findings. The process requires practitioners to be constantly aware of why a particular method is being used and how results will be compared with results derived from other methods. Also, when compiling reports it is necessary to describe how information from different sources and methods was combined to give "the diagnosis" and make recommendations.

Figure 1
The methods of participatory epidemiology



"Participatory methods are qualitative, so we can't publish the work"

While the qualitative nature of participatory epidemiology is clearly a concern for many veterinarians, it seems to be a particular problem for academics and researchers. The perception seems to be that unless research involves the collection of numerical data and presents some statistical summary or analysis, findings cannot be published in journals. When researchers are judged within a "publish or perish" culture, they favour conventional methods which are known and accepted by their peers and reviewers for scientific journals.

When considering this issue, two points were made:

- It is possible to describe many subjective opinions using numbers. For example, preference ranking requires an informant to assign numerical ranks to items or issues to demonstrate their preferences. In veterinary medicine, we commonly use body condition scores to summarise a subjective assessment of an animal's condition. Similarly, we can assign ranks or scores to lesions or clinical observations.
- By standardizing a ranking or scoring method, and then repeating the method, we produce numerical data that can be summarized using common and simple statistical methods.

In participatory epidemiology, ranking and scoring methods produce numerical data at an early stage in the method. Typically, within a particular survey these methods have been used as 'one-off' methods. For example, the results below show how one group of farmers ranked livestock diseases in terms of morbidity and mortality[2].

Scoring of livestock diseases in Abela Sipa, North Omo, Ethiopia

Disease	Mortality	Morbility
trypanosomiasis	*****(5)	*********(9)
anthrax	********(8)	****(4)
blackleg	********(8)	****(4)
ticks and tick-borne disease	**(2)	*******(7)
internal parasites	- (0)	********(8)

Note: A group of 12 male farmers were asked to score the five most important diseases in Abela Sipa peasant association out of 10, in terms of mortality and morbility.

[2] IIED and Farm Africa (1991). Farmer Participatory Research in North Omo, Ethiopia: Report of a Training Course in Rapid Rural Appraisal. International Institute for Environment and Development, London.

Participatory methods such as proportional piling can be easily standardized to understand local perceptions of disease incidence.

Example

Use of proportional piling to estimate incidence of cattle diseases in Tana River District, Kenya[3]

As part of participatory research project on bovine trypanosomiasis, a proportional piling method was developed to understand local perceptions of the relative incidence of livestock diseases in different age groups of cattle during the preceding 12-month period. Interviews with Orma informants indicated that their cattle were categorised by age group as *jabie* (calves to weaning age; 0-2 years of age), *waela* (weaner group, 2-3 years old), *goromsa* (young adult stock, including heifers and young bulls; age group 3 to 4 years) and *hawicha* (adult stock, particularly the milking cows kept around the permanent villages; > 4 years of age).

Using a pile of 100 stones to depict each age group, the stones were divided by informants into 'sick cattle during the last year' and 'healthy cattle during the last year'. The pile of stones representing sick cattle was then sub-divided by informants to show the relative numbers of cattle suffering from *gandi*/trypanosomiasis, *hoyale*/foot and mouth disease, *buku*/acute haemorrhagic trypanosomiasis, *sombal* CBPP, *madobesal* rinderpest and 'other diseases'. The method was repeated with 50 Orma pastoralists. An example of the kind of information arising from this method is presented in Figures 2 and 3 overleaf.

Important features of this proportional piling method were:

- Relationships between local disease names and veterinary terminology had been previously determined using other participatory methods, such as matrix scoring of disease signs supported by comparisons of local disease descriptions with standard veterinary textbook descriptions.
- This method was thought to be superior to questionnaires, because,
  - local terminology was used for the diseases and cattle age groups;
  - the comparison of different diseases reduced exaggeration;
  - the piling process was partly visual i.e. informants could see representations of sick

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

cattle (whereas a questionnaire involves only verbal communication);
- the method is flexible and informants can move stones between piles until they're comfortable with their responses;
- responses can be checked and probed using open questions.

However, there are also potential pitfalls when using this type of method:

- it requires very careful training of researchers and epidemiologists;
- there is a strong tendency to focus on "collecting the numbers" rather than following up results with probing questions;
- there is a strong tendency for researchers to record only the numbers, rather than also write notes on the following discussion.

Summary

In summary, participatory epidemiology involves:

- an approach and toolkit of methods that vary considerably from questionnaires;
- the use of interviewing, diagramming and scoring tools supported by reference to secondary literature and direct observation, leading to immediate field-level triangulation of data;
- if required, some standardization and repetition of methods to produce numerical data.

Examples of research publications based on participatory methods were distributed to workshops participants.

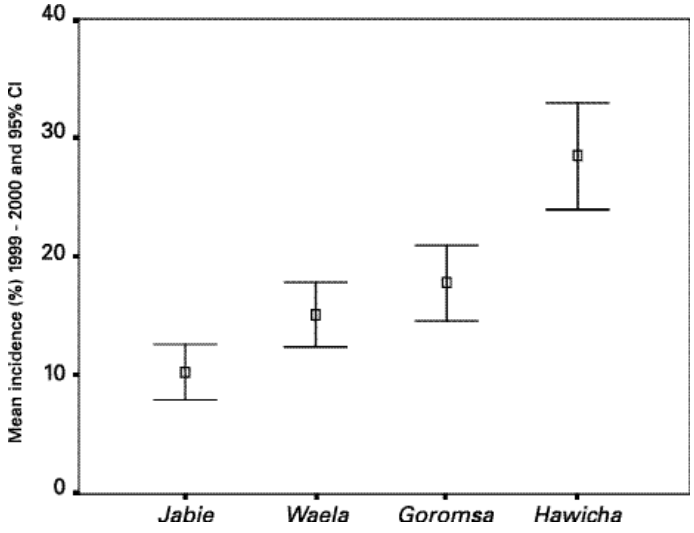


Figure 2
Estimated annual incidence of bovine trypanosomiasis *(gandi)* by age group

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

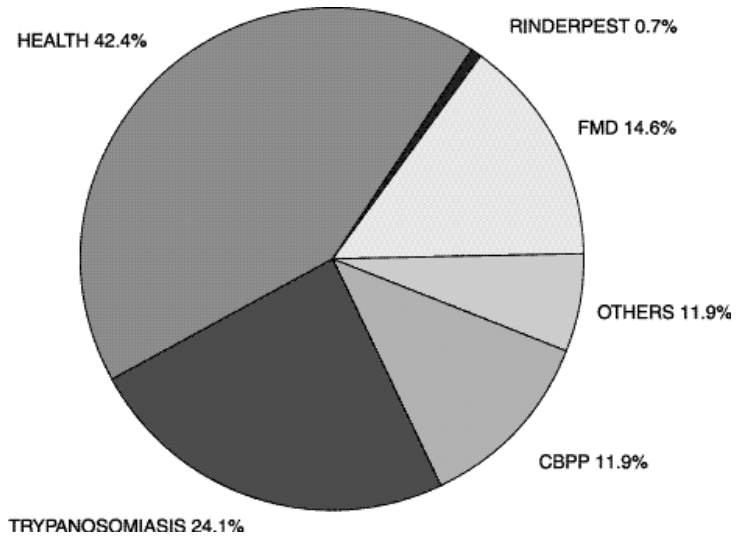


Figure 3
Estimated mean incidence of cattle diseases relative to healthy cattle, all age groups, 1999 - 2000

Issue 3
Training and learning in participatory epidemiology

Training Courses

The rapid growth of RRA and PRA in development work has been accompanied by the emergence of numerous training courses. These courses vary considerably in their content, training methodology, duration and trainer experience. During the workshop, a training course in participatory epidemiology for veterinarians was proposed based on the courses run by the International Institute for Environment and Development and the Institute of Development Studies in the late 1980s and 1990s. These courses included initial classroom-based sessions followed by field practice. The length of the courses was around 10 days.

Therefore, the proposed training course in participatory epidemiology comprised the following sessions:

Outline of an Introductory Training Course in Participatory Epidemiology

Session 1: Origins of participatory approaches and methods
Farming Systems Research
Applied Anthropology
Adult Education Movement
Agroecosystem Analysis
Rapid Rural Appraisal

Session 2: Concepts of community participation in development
Historical background to community participation
Meanings of community participation
Examples of applications, uses and abuses

Session 3: "Rural Development Tourism"
Spatial bias
Temporal bias
Project bias
Diplomatic bias
Person bias
Professional bias

Session 4: Key features of participatory epidemiology
Attitudes and behaviour of practitioners
Mixed methods- participatory and conventional
Secondary data
Managing groups
Key informants
Triangulation
Optimal ignorance

Session 5: Methods - interviewing methods
Principles of informal interviewing
Use of open and probing questions
Use of checklists - written and mental
Examples from veterinary epidemiology
Practical sessions

Session 6: Visualisation methods - participatory mapping
Priniciples of mapping
Types of maps (social, natural resource, movement etc.)
Examples of maps used in epidemiology
Practical sessions

Session 7: Visualisation methods - Seasonal Calendars
Principles and methodologies
Examples from epidemiology
Practical sessions

Session 8: Ranking and scoring methods
Principles of ranking and scoring
Types of ranking and scoring
Examples from epidemiology
Practical sessions

Session 9: Summarising and analysing data
How to handle ranks and scores
Statistical tests for non parametric data
Assessing agreement between informants
Multidimensional scaling, GPA, correspondence analysis and other methods

Field practice: Five days in the field
This is crucial!
Provides opportunity to practice methods and address any misunderstandings
Summarise and analyse data - in the field
Feedback and cross-check findings
Evaluation of methods
Write report

Who To Train?

It is often said that 'not everyone can do PRA'. In fact, a growing body of experience in participatory approaches and methods in various technical sectors shows how the attitudes and behaviour of practitioners is probably more important than their knowledge about specific methods. This experience indicates that certain types of people feel more comfortable with PRA than others and are more successful at applying the approach.

In order to prompt discussion on the characteristics of a 'good participatory epidemiologist', Jeffrey Mariner introduced participants to the Briggs Myers Personality Type. This system helps to characterise people by personality type and is used by various organizations to assign tasks to staff with particular attributes.

At its most basic level, the Briggs Myers uses the following characteristics:

Extrovert (E)	Introvert (I)
Sensing (S)	intuition (N)
Thinking (T)	Feeling (F)
Judging (J)	Perceiving (P)

These characteristics are explored through a series of questions:

1. Where do you direct your energy?
- To the outer world of activity, and spoken words?
- To the inner world of thought and emotions?

Characterisitics associated with extrovert verses introvert people are as follows:

Extroversion	**Introversion**
Social	Private
Expressive	Quiet
Many	Few
Broad	Deep
Interaction	Concentration
Outward	Inward
Action before thought	Thought before action

2. How do you process information?
- In the form of known facts and familiar terms?
- In the form of possibilities or new potential?

Sensing	**Intuition**
Facts	Patterns
Experience	Novelty
Present	Future
Practicality	Aspiration
Enjoyment	Development
Realism	Idealism
Using	Changing

3. How do you make decisions?
- On the basis of logic and objective considerations?
- On the basis of personal values?

Thinking	**Feeling**
Analysing	Sympathising
Objective	Subjective
Logical	Personal
Criticism	Appreciation
Onlooker	Participant
Decides on principle	Decides using values
Long term view	Immediate view

4. How do you prefer to organise your life?
- In a structured way, making decisions and knowing where you stand?
- In a flexible way, discovering life as you go along?

Judgement	**Perception**
Close	Open
Decide	Explore
Structure	Meander
Organise	Inquire
Firmness	Flexibility
Control	Spontaneity

Although there wasn't enough time during the workshop for a thorough discussion on this personality test, the key point was that different people have different characteristics and behaviours. For epidemiologists, some people are instinctively more at ease when dealing with objective data and 'black and white' situations whereas other people seek to understand grey areas and can cope easily with uncertainty. Similarly, some researchers prefer the structure of a pre-ordered learning process but others prefer open-ended inquiry and like to respond to new information as it arises.

Recognition of these kinds of attributes together with communication skills can assist senior managers to identify staff who are most likely to benefit from training in PE and apply the approaches and methods effectively in the field. Such people are usually natural and relaxed communicators, observant of local customs and norms, and respectful of other people's views.

How can participatory epidemiology assist PACE?

Participatory Disease Modelling

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[2]International Livestock Research Institute, PO Box 30709, Nairobi, Kenya
[3]Emergency Prevention System for Tranboundary Animal and Plants Pests and Diseases (EMPRES), Animal Health Service, Animal Production and Health Division, Food and Agriculture Organization, Viale delle Terme di Caracalla, 00100 Rome. Italy.

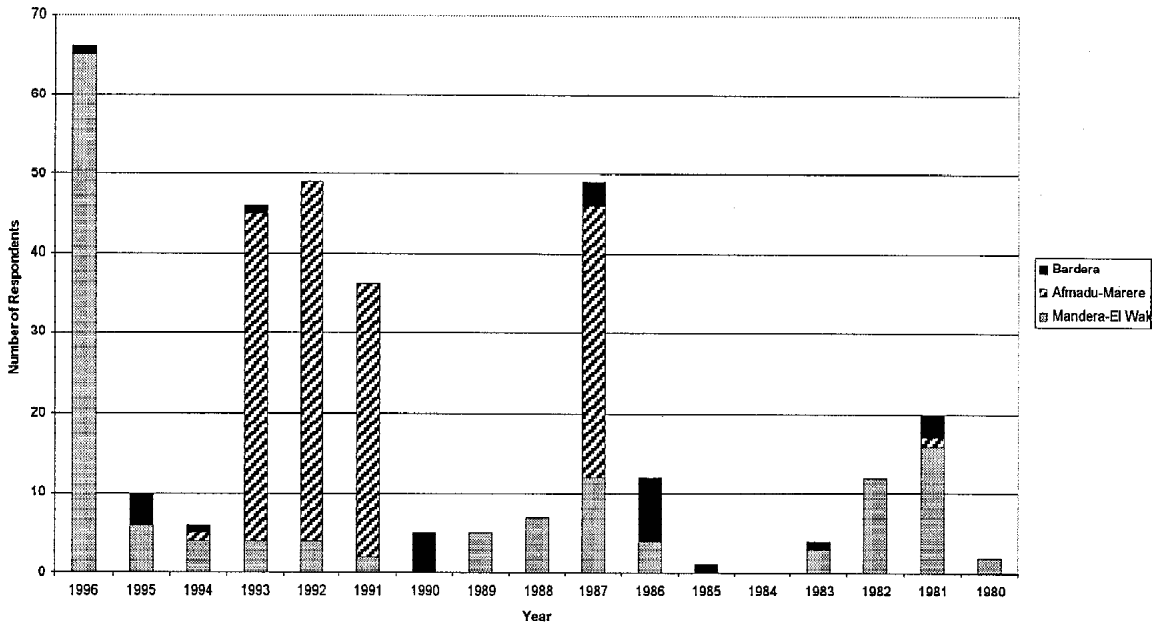
Infectious disease modelling relies upon quantitative data and expert opinion to make parameter estimates. In conventional disease modelling experts include epidemiologists and microbiologists. This paper describes a state-transition model of rinderpest transmission dynamics in East Africa. The model differs from previous rinderpest models and disease models in general in that the knowledge of the owners of the livestock populations being modelled is utilized as expert opinion to derive parameter estimates and validate the model.

Participatory epidemiologic tools were utilized to estimate population demographics, rinderpest mortality rates, population contact structure and inter-epidemic periods. Published laboratory inoculation data was used to estimate latency and infectious period. The basic reproductive number was derived from serologic data obtained during periods of endemic stability. The estimates of basic reproductive number and infectious period were in turn used to estimate effective contact rates. The model was validated by comparing the predicted epidemic curves with historic information provided by farmers on the actual temporal patterns of outbreaks in two different endemic scenarios.

The model is a simple, open population SEIR state transition model that incorporates stochastic elements when transmission levels are low. The structure of the model is presented in Figure 1. The model incorporates vaccination as either a continuous or a seasonally pulsed process.

Rinderpest is southern Sudan is caused by moderately virulent rinderpest virus from African lineage 1. In Somali, a mild form of rinderpest due to Africa lineage 2 is believed to be present. The model successfully reproduces the endemic

Figure 1
Temporal distribution of herder reports of rinderpest in Somali ethnic areas of East Africa: 1980-1996



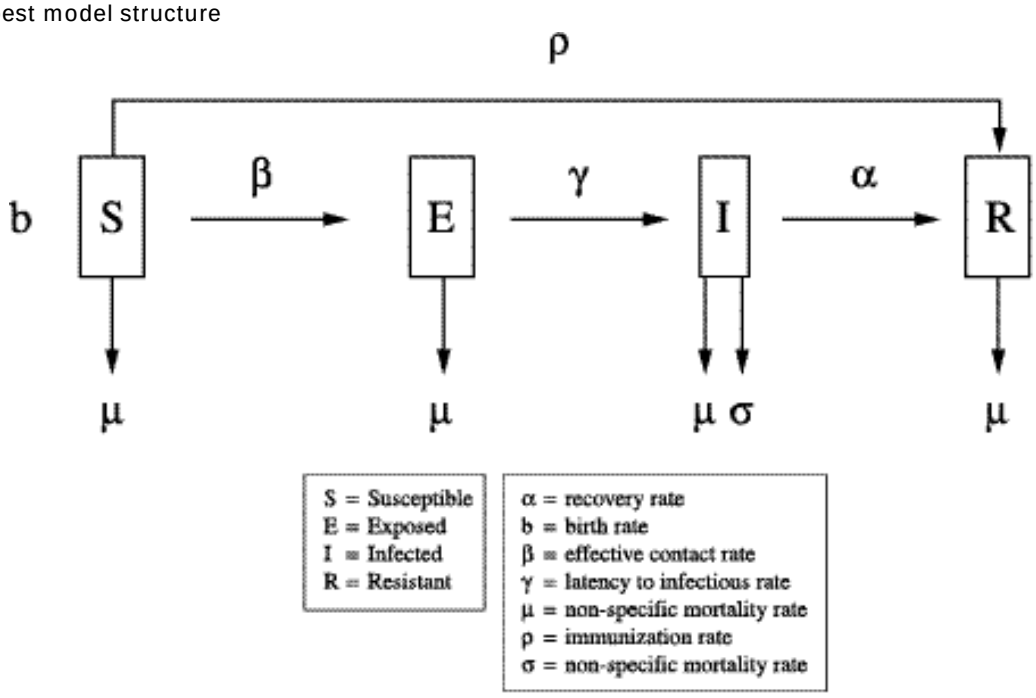
patterns of disease for both southern Sudan and Somalia when appropriate sets of parameters are entered to reflect the differences in predominant rinderpest lineages.

Model experimentation has been completed to assess the impact of different vaccination strategies on the probability of disease eradication. Sub-optimal rates of vaccination decrease overall mortality but increase the temporal duration of outbreaks. A threshold effect is evident where moderate levels of initial vaccinal population immunity predispose populations to endemic persistence of rinderpest following a disease introduction.

The outputs of the model include annual population, prevalence, incidence, mortality and herd immunity and vaccination. These output parameters can utilized in economic consequence modelling and form the basis for cost-benefit analysis of alternative control and eradication strategies.

This participatory approach to disease modelling demonstrates the power of appropriate combinations of qualitative participatory and quantitative analytical epidemiology. This epidemiologic analysis is entirely grounded in an intimate understanding of the field dynamics of rinderpest in the remote and insecure locations were the disease is presently persisting. Such analysis would not be possible without the direct aid of livestock owner's knowledge to both inform and validate the process.

Figure 2
Rinderpest model structure



Participatory Epidemiology and Disease Surveillance

This session was introduced with a brief discussion to establish a consensus on the meaning of the term surveillance and some of the different types of surveillance. The discussion group agreed that surveillance was described by the following phrases:

- the collection of information for action,
- an on-going or continuous process,
- information about events
- the detection of events
- feedback to information to providers and effective response

The group distinguished between general surveillance, where information is collected on a number of disease or health events and targeted surveillance, where information is collected on a specific disease as part of a control strategy. The terms passive and active were also mentioned as two categories of surveillance. It was stated that passive surveillance was the routine collection of information as part of the normal day-to day activities of the field surveillance. Active surveillance involves some form of outreach to encourage reporting or actually to collect data in the field.

After presentations on general and targeted disease surveillance, a discussion was held where participants stressed the importance of community-based animal health networks as information resources for national disease surveillance networks. It was noted that CAHW networks have been implemented by government, projects and NGOs. The debate centered on how best to incorporate CAHW networks into the surveillance system. Government veterinarians expressed their frustration at the lack of communication between veterinary services (VS) and project and NGO-based animal health programmes. It was noted that many projects and NGOs had made concerted efforts to involve veterinary services, but in the absence of a policy framework and operating system, it was difficult for CAHW networks to access the national systems.

The following points were made:

- CAHWs are farmers and have the right to make disease reports.
- Monthly monitoring of CAHWs is an important animal health information resource.
- A communication gap exists between farmers and veterinary services.
- VS have no stated policy on the use of CAHW networks as information resources.
- VS have not put in place a system to collect animal health information from CAHW networks.
- NGOs are usually registered and involve local VS staff in training and monitoring activities at the NGOs expense.
- Higher levels of the veterinary service are often not aware of the activities of their field veterinarians in CAHW networks as the veterinary service do not have systems in place to monitor and coordinate NGO and project-based animal health activities.
- Effective feedback of summarized information to data providers (CAHW monitors, CAHWs, and livestock owners) is key to the sustained success of any programme.

It was the consensus of the discussion that all stakeholder were willing and motivated to work towards integration of community animal health into the national service delivery and surveillance systems. It was agreed that stakeholder workshops should be held to renew dialogue on the basis of mutual respect between the VS, projects, NGOs, profession and livestock owners. The objective should be to establish a positive and productive framework for animal health information exchange.

Experiences with assessing and quantifying disease surveillance information for small ruminants as obtained through the Nomadic Animal Health Auxiliary System (NAHA-System) in the Central Rangelands of Somalia

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Disease surveillance data were collected during 4 visits to 21 Nomadic Animals Health Auxiliaries (NAHA) from 7 villages/degaans[4] (Halgan, Jameeco Muktar, Bulo Burti, Biyo Neef, Aboorey, Maxas, Maqokorey) in Bulo Burti (B/B) district of Hiraan Region from February 1987 to April 1988 using customized data recording sheets.

In an attempt to identify the disease situation as encountered and reported by the NAHAs and to quantify such disease information the following analytical steps were taken:
First, the common Somali terms used for small ruminant diseases and symptoms in the study district were noted and congruency with scientific terminology determined.

Then, the occurrence of a disease/symptom was expressed by the number of animals treated/ affected (numerator) and the number of flocks harbouring animals treated/affected (denominator) to calculated the average number of animals affected in a flock affected. As flock sizes vary within the district the average flock sizes of 163 in B/B district was used as denominator (and the factor 100 included) to calculate the percentage average animals affected in an average flock. This flock disease index (FDI) served as a measure to quantify a disease as an individual animal problem or a flock problem, and, thus broken down into the following categories, i.e. >0 - 5%, >5 - 10%, >10 - 20%, >20 -30%, >30 - 40%, >40 - 50% and >50%.

For the disease data reported differentiation was made between the active involvement of the NAHA i.e. inspection and/or treatment of diseased animals, and his role as mediator for disease intelligence evolving from his pastoral community.

[4] The traditionally managed communal grazing area of about 1000 to 3000 km2

Reporting periods for each visit were the preceding months whereby the following calender-wise classification for the four different climatic seasons Gu (long rainy season) from March 22 to June 21, Hagaa (short dry season) from June 22 to September 21, Dayr (short rainy season) from September 22 to December 21, and Jilaal (long dry season) from December 22 to March 21, was applied. Within the district villages/degaans were grouped into ecological sub-zones, i.e. "Inland" (Maxas, Maqokorey, Aboorey and Nooleye) and "Riverine" (Bulo Burti, Biyo Neef, Jameeco Muktar, Halgan). The age of treated/affected animals was classified according to age groups (0 -1 year, 1.1 - 2 years, over 2 years).

The case fatality rate of a disease was assessed by asking the following question: "If 10 animals are affected by the disease, how many will die without treatment ?" and expressed in percent. To enable differential diagnosis and to allow for a more detailed disease description the immune status (after recovery) of the animals was inquired and recorded as immune (= yes = more than 50% of the animals affected) or not-immune (= no = less than 50% of the animals affected). The effectiveness of the drugs applied did also enter the data collection.

The existing confusion for different locally used Somali terms for single diseases, disease syndromes or gross symptoms in sheep and goats, even at the village/degaan level, could be demonstrated. For instance, the vernacular terms Sambab (literally: lung) and Agmar are considered to stand for pneumonia, which again was often synonymous for CCPP.

To deepen the understanding of certain diseases or disease complexes of small ruminants such as Qanje (literally: lymph node), but also termed as Tu or Riimiye in some villages/degaan, oral reports given by the NAHAs on symptoms and post-mortem findings were listed and broken down by village/degaan.

Flock disease indices for ecological sub-zones demonstrated and quantified the importance of Sambab in all villages/degaan of B/B district with a marked higher FDI in the "Inland" degaan of Maxas, where Qanje also seemed to play a prominent role.

Endoparasites and cases of diarrhoea appeared with higher "prevalences" in the ecological sub-zone characterised as "Inland" than in the "Riverine" sub-zone. A disease such as FMD in small ruminants seemed to be restricted to individual villages/degaan, e.g. being endemic in Aboorey and, thus, not causing serious losses.

Sambab, the most prominent disease in B/B district, is a dry season disease; over 80% of the cases reported and treated by NAHAs occurred in the dry seasons Jilaal and Hagaa. The FDI in roughly half of the cases ranged between 5% and 10%. However, in a single flock up to 60% of the animals were found affected. Sambab case fatality rates showed a wide range believed to be likely due to different pneumonia-causing agents and strains. In all cases reported and treated sheep and goats over 2 years of age were attacked. Young stock (less or equal to 1 year) played obviously a minor role. The full effectiveness of the antibiotic Oxytetracyclin could be demonstrated.

A coincidence of anthelmintic treatments asked for by flock owners with wet and humid climatic conditions leading to a rise in endoparasites of sheep and goats could be shown. In half of the flocks 5% to 10% of the animals were considered to deserve anthelmintic treatment by the NAHAs. However, a good numer of anthelmintics sold to and administered by the flock owners themselves reflected the demand for appropriate and effective anthelminthics.

In order not to loose potential information observations regarding diarrhoea, though low in number, were recorded separately. A trend of likely occurrence of diarrhoea - a symptom, not a disease itself - in dry seasons was apparent.

For the first time livestock disease surveillance data obtained through veterinary auxiliaries from a primary animal health care delivery system in Central Somalia, the Nomadic Animal Health Auxiliary System, are demonstrated.

It has to be considered that the reports of disease treatments and patterns were provided orally by the local NAHAs and then transferred onto the data recording forms of the CRDP/GTZ Veterinary Component. Thus, figures generated should not be taken as absolute, but rather illustrating the magnitude of a condition. Figures are further confounded by the willingness for veterinary attention emerged from the decision of the livestock herder that treatment of a diseased animal in his/her flock is economically justified and, thus, unalterable. Therefore, the methodology applied served as a tool to primarily exhibit trends in disease patterns and to provide additional data on yet not well defined disease complexes such as Qanje in small ruminants.

Disease Surveillance and Community-based Animal Health: Experience of the Operation Lifeline Sudan Southern Sector Livestock Programme

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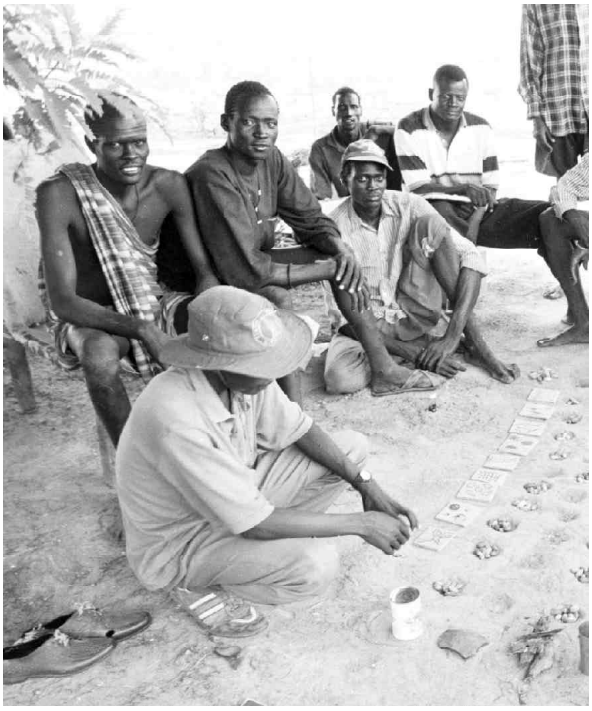

The OLS Southern Sector Livestock Programme has approximately 1000 CAHWs who have received two weeks basic training in disease diagnosis, treatment and vaccination. In addition there are approximately 150 supervisors who have been trained for 4-9 months in animal health, and approximately 35 field veterinarians employed by NGOs/FAO.

Routine information on cases treated is recorded by CAHWs on a pictorial monitoring form. Approximately once a month, each CAHW reports to his/her supervisor to report on medicine usage, collection of revenue and treatments carried out. The information in the pictorial form is summarized onto a summary form. This is submitted to the field veterinarian. The NGO extracts any data they require from the form and then all forms are submitted to FAO for entry into a centralised database.

Vaccination is usually carried out as teams of CAHWs. Vaccinations carried out are recorded by a literate member of the team on a daily vaccination form. These are submitted to the supervisor who passes them to the NGO for submission to the FAO database.

In addition, CAHWs report any outbreaks that have been reported to them by livestock keepers, or any outbreaks observed during their routine work. The CAHWs give an oral report to the supervisor of history and clinical observations. The supervisor will then follow up by visiting the outbreak and carrying out a basic investigation; history, clinical examination, post mortem examination (if possible) and collect samples (some but not all supervisors have sampling kits and are able to collect and submit samples). The supervisor then fills in an outbreak report form. This is sent to an FAO vet in Lokichokio who is the focal point for outbreak information. The supervisor also reports to the field veterinarian and if he/she is in the area, they will also follow up and verify the findings for the supervisor and collect samples if not already done. If the outbreak is urgent or severe, then outbreak information is sent by radio message. FAO will then follow up the report, either by asking for further information, providing appropriate medicines or vaccines, or by visiting to carry out further investigations.

Treatment, vaccination and outbreak information is collated into a summary report that is reported back to NGOs and field supervisors either quarterly or during livestock co-ordination meetings. Data is used by NGOs and FAO in compiling reports to donors.

Future plans in the context of the final stages of rinderpest eradication:

- outbreak reporting - to continue with the existing system but to provide training and field support to improve the quality of investigations, reports and follow up,
- active surveillance - CAHWs to be looking for rinderpest-like disease and talking with cattle owners about possible rinderpest, supervisors to be carrying out clinical surveillance and interviewing livestock keepers during routine cattle camp visits, and in markets, supervisors also to be involved in sero-surveillance collecting an agreed number of samples in their area for an agreed payment,
- RP Project field staff to carry out participatory disease searching in areas of possible RP endemicity, or as part of outbreak rumour investigation.

Participatory Disease Searching

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Introduction

Participatory Disease Searching (PDS) as part of participatory epidemiology is enabling veterinarians to collect information on specific disease situations. This paper describes PDS as related to rinderpest.

The specific methods and processes that are most useful for PDS are:

- Open-ended questions
- Probing
- Time-lines
- Triangulation (cross-checking of reports and data from different sources)
- Use of key informants
- Mapping
- Clinical observation and transects

What is the problem?

We have to define the problem as precisely as possible. For example, in the case of rinderpest control PDS can be conducted to:

- Ascertain rinderpest status
- Establish the last date of a rinderpest outbreak
- Reveal recent stomatitis-enteritis (S-E) outbreaks for investigation purposes
- Collect baseline data for sero-surveillance

Preparations for PDS

- Rinderpest is a disease that depends on the mixing of livestock for survival.
- There are no known carrier states or examples of chronic infection.
- The virus survives through the continuous occurrence of new acute cases in susceptible animals.
- Thus, the virus must continuously find new susceptible animals for survival.
- A safe, effective and inexpensive vaccine exists that has been successfully applied in most areas where veterinary service delivery is reliable.

These factors suggest, and indeed experience has shown, that remote, marginalized pastoral communities, where livestock contact rates are high and vaccination is sporadic, are often the reservoir for the endemic persistence of rinderpest (Mariner, 1996).

As a first step, an inventory of remote cultures and communities should be made and secondary sources of information should be obtained and researched.

In PRA, one often looks at 'proxy indicators' in regard to sensitive subjects for which it may be difficult to obtain unbiased direct information. Remoteness, insecurity, and lack of services can serve as proxy indicators for the likely presence of infectious disease when prioritising search areas at the national level.

It is especially important to avoid 'tarmac' or access bias in regard to rinderpest searching. As with any disease investigations, the appraisal team should carry all necessary sampling materials in case a SE outbreak is encountered.

PRA checklist for a Participatory Rinderpest Disease Search

1. Introduce the appraisal team as an animal health appraisal.
2. Identify the respondents and establish if they cattle owners.
3. Establish their main herding locations (mapping).
   Items 1 to 3 introduce the subject and establish the identity of the participants
   Items 4 to 6 are an expanding enquiry into animal health problems.
4. What are the current cattle disease problems in their herd? If tearing or diarrhoea is mentioned, explore these syndromes in detail. This item investigates what animal health problems the respondents are personally and presently facing.
5. What are the current cattle disease problems in the area? This item inquires into what animal health problems the immediate community is presently facing.
6. Historically, what are the most important disease problems of cattle? This item inquires into the most significant animal health problems the community has faced regardless of time.
   Invariably rinderpest is mentioned in the response to this question if the cattle owners have experienced outbreaks in the last two decades. Frequently it will be the first disease mentioned.
7. Have they personally seen rinderpest in their lifetimes? What does it look like?
8. When was the last time their cattle where affected by rinderpest? Where did it occur? Where did it come from?

As warranted, further probing questions can be added to cross-check reports made in other interviews, further define cattle movements which may affect the epidemiology of the disease, or to contrast current outbreaks with previous outbreaks in regard to the severity of disease.

Interviewing as a tool for PDS

One of the objectives of PDS is usually to gather complete information about all disease situations in the village livestock. Ideally, all owners of the relevant livestock species in the village should attend the interview. The best people to have at the interview are those that know the animals best. As with other types of disease searches:

The interviewer should be careful not to communicate their specific interest in rinderpest to the respondents. If possible avoid travel in vehicles used in rinderpest control activities or with individuals locally known to be specialized in rinderpest control. The interview should be introduced as a general study of animal health issues in cattle or a similarly broad theme.

Disease names

The choice of words is particularly important when discussing particular disease. The appraisal team will often think about diseases as particular entities, each with a particular separate cause. On the other hand, think more in terms of disease syndromes. When an animal behaves in a particular way, and shows particular signs, then it is thought of as a particular disease. This disease syndrome may have a unique local name, or the technical name of a particular disease may be used. The tendency of livestock owners to talk about disease syndromes based on patterns of clinical signs, rather than specific diseases should be kept in mind during the interview. Mistakes can be avoided by paying attention to a few points.

Don't use the technical name for a disease when asking about that disease. If you know the local name, and understand what disease or diseases it truly represents, then use that name. In some situations, the clinical signs and behavior of the disease in the population are distinctive enough to be sure that the name given by owners does refer to a single disease. In others, it is not so simple.
The eliciting process of all known cattle disease names should be in the language of the community. This works particularly well with a small group as the stories and ideas of one important often spark the mind of another. However, there are several biases that should be avoided.

Seasonality: livestock owners are most likely to mention diseases of the current season. After those are elicited, ask specifically for diseases most prevalent in other seasons and /or year round.

Severity of disease: livestock owners are most likely to give the names of the most serious (i.e. fatal) diseases so make sure that chronic diseases and those which are not fatal, but may lead to production losses, are also recorded.

Incidence of disease: it is useful to ask the group whether there are diseases that appear only periodically otherwise one might miss major epidemics that sweep through an area, or conditions that appear only in unusual climatic circumstances.

Persistent questioning

One rule of collecting information through interviews is that you should never be satisfied with the first answer. When a question is asked, there is the danger that the answer could be wrong, either for the reasons listed previously, or else because the experience of the person answering doesn't represent the experience of the whole village.

It is a good idea, therefore to check and recheck every answer that is received. Asking the same question in several different ways, to several different people, does this. Each time, the question focuses on some different aspects of the problem, and each answer is compared. If there is some inconsistency, then discussions started to try to resolve it and come up with a consensus.

Topics for probing

Probing on specific subjects can provide very useful insights into community knowledge on disease epidemiology, pathology and diagnostic processes. Often it is best to reserve these probing sessions for especially knowledgeable key informants. These are usually more senior members of the community respected and consulted by the community for their livestock knowledge.

Diarrhoeal disease:
In a subset of interviews, the community should be probed about the different terms used to describe diarrhoeal disease. Points to be investigated are:
What terms are used to signify diarrhoea in general?
Are different types of diarrhoea distinguished (i.e. bloody vs. non-bloody, acute vs. chronic, etc.)
What specific diseases do they associate with diarrhoea?
What indicators are used to differentiate between different diarrhoeal diseases?

Disease concepts and methods of rinderpest transmission:
It is useful to attempt to understand local concepts regarding the cause of disease and methods of transmission. In regard to rinderpest, pastoralists

can often accurately describe risk factors and types of contact that lead to transmission. Knowledge in these areas varies significantly between communities and it is important not to make assumptions.

Mapping

Rinderpest is a disease that depends on cattle contact and movement for its survival. Mapping of cattle movement and determination of inter-community contact is a very important activity in regard to understanding local rinderpest ecology.

In order to initiate a mapping exercise, respondents should be asked to specify their primary grazing sites by season. Depending on the complexity of the bio-climatic system, it may be worth constructing a seasonal calendar as a companion exercise. Often, pastoralists will specify location names that are not evident on modern maps. These initial questions often turn to a discussion of just exactly where these key resource sites are which naturally leads to the sketching of maps on the ground.

A broad area about an arm and a half reach should be cleared and smoothed. Usually, participants will naturally gather round and equip themselves with the necessary tools: normally sticks and other objections to assist in drawing and act as land marks. The participants should first be asked to indicate key landmarks such rivers, market towns, major wells or watering sites. Then the grazing sites can be indicated. In addition to normal grazing sites, emergency-grazing areas used in time of drought or insecurity should be indicated. For rinderpest epidemiology, the data on movement, mixing (contact) and trade will be the most significant. These will be key factors in subsequent risk analysis and in disease control strategy design. Movement and contact data relative to the presence of the virus will determine where and when vaccination or surveillance is appropriate.

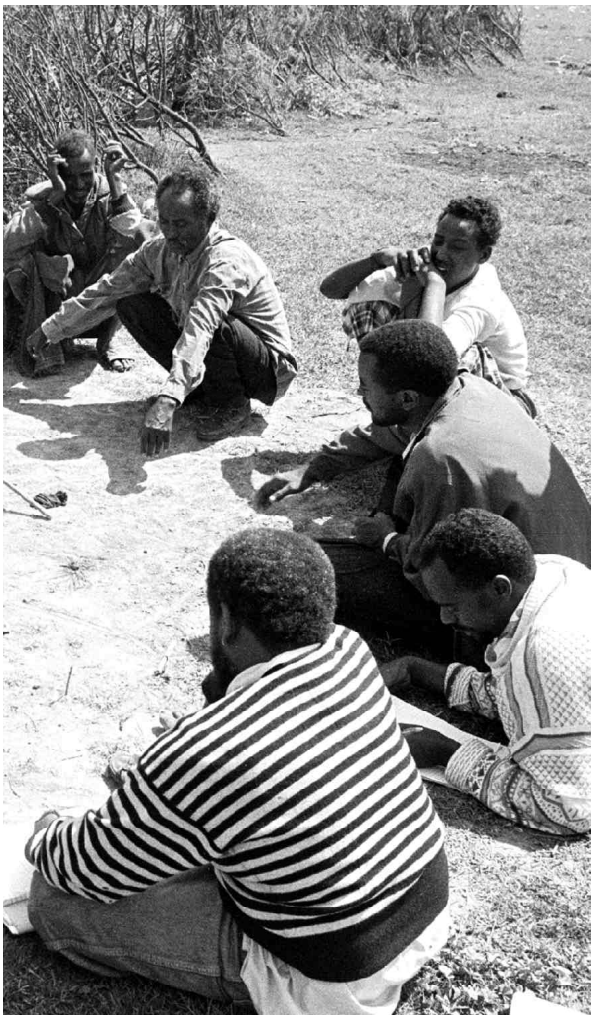
Clinical observation, sample collection and transects

Before or after an interview, it is always useful to walk the camp, herd and adjacent environment. In rinderpest disease searching, tearing is a sign that can be detected at a distance. If you are walking the herd prior to the interview and note tearing, it is best not to call attention to the sign. Proper clinical exams should be carried out after the interview. The only exception is when the livestock are on the move and you run the risk of losing the opportunity.

Analysis of results

Participatory disease searching is somewhat different from other types of PRA. Most PRA interviews start at a general level and work towards specifics. The interview technique used in PDS casts an ever-broadening net until the respondents volunteer rinderpest as a problem. At this point the interview begins to focus down on EVK regarding rinderpest. This could happen at any of three levels: current personal experience, current personal observation or in the past. Part of the process of judging the quality and significance of reports relates to when the respondent introduces the subject of rinderpest.

As described previously, reports of rinderpest or other SE events should be categorized, tabulated and examined for trends or unifying factors. The existence of the stomatitis-enteritis outbreak definition and guidelines for comprehensive rinderpest surveillance assists in the analysis of rinderpest PDS results.



Participatory epidemiology in veterinary research and education

This session involved a discussion group of representatives from veterinary schools in the Horn of Africa and east Africa region to discuss:

- Research needs in participatory epidemiology
- Training needs in participatory epidemiology in veterinary schools

Research needs

Discussion began on conventional versus participatory research approaches, because ideally, participatory epidemiology should be used within a participatory research context. Conventional and participatory research was summarized in the table below.

The point was also made that participatory research should be action-orientated and result in products that livestock keepers can use or benefit from.

The second part of the discussion focused on specific areas of research to further refine PE methods, apply existing PE methods or further examine CAHW programmes. The main research topics were:

- The use of PE in disease investigation and surveillance;
- The use of CAHWs as disease reporters, with emphasis on sustainability issues and incentives for reporting in a privatized system;
- Economic assessment of CAHWs;
- Characteristics of CAHW systems such as effective selection of CAHWs, gender issues and the pros and cons of illiterate versus literate CAHWs;
- Impact assessment of CAHWs

Training opportunities in veterinary schools

The group confirmed that very little, if any, training in PE was currently taking place in veterinary schools in the region. Short seminars and introductory training in PE for small numbers of faculty staff had been conducted at the Faculty of Veterinary Medicine, Sokoine University of Agriculture (Tanzania) and the University of Nairobi (Kenya), with support from the CAPE Unit of OAU/IBAR.

It was generally agreed by representatives from Uganda, Ethiopia and Tanzania that more training and experience in PE was required in veterinary schools. Various ideas were proposed concerning whether PE should feature in undergraduate or postgraduate courses. Some participants felt that the undergraduate course in their schools was already too full to allow space for PE, while others felt that PE was of sufficient importance to introduce at the undergraduate level. Finally, some people suggested that PE was still new and that postgraduate courses were the most appropriate place to teach people about PE.

This general interest in greater learning about PE indicated that the CAPE Unit should further develop support to veterinary schools in the region.

	Conventional research	Participatory research
Who identifies the research topic?	Researcher(s)	Users
Who plans the research?	Researcher(s)	Researcher and users
Which methods are used?	Formal	Formal and participatory
Who owns the results?	Researcher	The group had mixed opinions: 'Should rest with users' 'The researcher(s)' 'Joint, but depends on funding'
What is the final research product?	A scientific paper	A technology or adoption of technology
Who provides resources?	Mainly the researcher, via an external funding source	Joint provision of resources
Who evaluates the research?	The researcher's manager, peers or examiners	The users

Session 4

National PACE Programme Working Groups

Tasks for Working Groups

During this session, participants were divided into working groups representing National PACE Programmes from Ethiopia, Kenya, Somalia, Sudan, Tanzania and Uganda. Each working group was requested to complete the tasks described below.

1. As a working group, what are the main "lessons learned" from the presentations and discussion groups during the workshop. List these lessons and rank them in order of importance.

2. By reference to the objectives of:
   - National PACE Programmes
   - CAPE Unit
   - Veterinary schools and research centres,

   identify specific ways to use participatory epidemiology to add value to PACE.

   Ideas arising from discussion so far include,
   - Use of participatory epidemiology to improve understanding of epizootic diseases in pastoral areas
   - Testing of community-based surveillance systems
   - Participatory impact assessment of CAHW services
   - Further development and testing of PE methods and approaches

   The working group may identify other needs in addition to this list.

   Please be specific. Try to make specific proposals based on your knowledge of existing disease control priorities and presence of CAHW or other services on the ground. Which diseases should we look at in which areas? Who are the key players who should be involved? What are the deadlines for completing the work?

3. Identify training/educational needs for the various players involved in testing and applying PE in pastoral areas.

   Outline a training plan which specifies who should be trained (which people in which institutions?) and when (what are the deadlines by which training should have taken place?).

Presentations by Working Groups

1. Lessons learned during the workshop

PACE Ethiopia
- Created more awareness on PE
- Methods used and constraints in PE
- Involving local communities in information gathering way of using indigenous knowledge
- CAHWs as collectors of data to be integrated into national animal health information systems.
- Ways to integrate PE results in conventional research, i.e.
  - Training needs in PE
  - Incorporation of PE in research and learning institutes

PACE Tanzania
- Scope and potential application of PE in disease surveillance
- Participatory tools can be used to suit particular situations (flexible and adjustable)
- Better results/findings can be obtained by the use of both quantitative and qualitative methods of investigation
- Results from PE can be used in contemporary epidemiological techniques, modelling and risk assessment
- Indigenous knowledge can be captured, appreciated and used effectively; cultural and nomenclature differences need to take on board
- Appreciation of the involvement and ownership by stakeholders and target groups
- Often a lack of common understanding about what PE is, what it can do and best practice and application

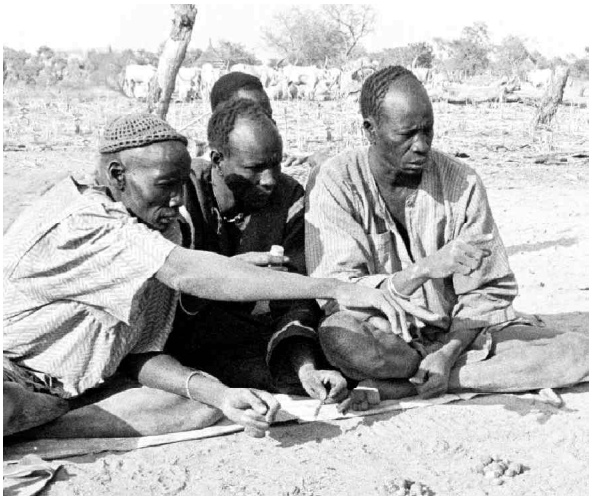
PACE Uganda
- PE can help tap the available local knowledge pastoral areas
- PE can complement the existing surveillance systems
- PE can generate baseline data that can help to target surveillance and research
- PE is associated with projects and NGOs - how sustainable are these?
- PE implies ownership, learning empowerment the local communities

- There is a need to integrate the PE into the National Surveillance Network
- Need to co-ordinate PE activities at district and national levels
- Need to train personnel in personnel at all levels in PE methods

PACE Sudan
- Potential for getting information from CAHW
- How valid - does it fit in the system
- Comparison between different methodologies PE
- Exchange of ideas and practices
- Respect, recognize and make use of indigenous knowledge to be incorporated into research activities

PACE Kenya
- Use of PE improves the understanding of epizootic diseases in pastoral areas.
- Empowers communities to identify and solve their own problems
- PE is not structured questionnaire
- Combined qualitative and quantitative is "best practice"
- Useful in testing community-based surveillance systems
- Participatory impact assessment of CAHW services
- Need for further development and testing of PE methods

PACE Somalia
- To combine PACE Methods with conventional epidemiology methods
- PE methods useful for validation of certain information, models, concepts
- PE methods useful for descriptive epidemiology (disease alert, pattern, livestock movement)
- Useful for first steps in an area to assess the health situation (if a disease problem exists better than disease is mild or endemic)



2. Ways to use participatory epidemiology in National PACE Programmes

The common themes in National PACE Programme objectives are:

1. Final eradication of rinderpest
2. Strengthening national epidemiology capacity
3. Control of major epizootics
4. Improved veterinary service delivery and privatization

PACE Ethiopia
Participatory epidemiology can assist the programme by:
- Providing information from remote areas
- Passive surveillance by making use of CAHWs through an established system
- Active surveillance using PE methods

This will lead to:
- Better understanding of disease
- Refining strategies
- Early warning and early reaction

Specific activities
- Inventory and assessment of CAHW programmes
- Establish linkages and improve information flow between CAHW/NGOs and government veterinary services
- Introduce PE into CAHW projects (widen scope to reporting)
- Standardisation of information
- Monitoring and evaluation
- Collect indigenous knowledge
- Incorporate into teaching and research

CAPE can act as an initiator and facilitator of these activities

PACE Tanzania
In PACE Tanzania, CAHWs are considered under the objective 'Improvement of the Delivery of Veterinary Services'. So far, PE as a tool was not been included in the implementation/activities in the PACE Tanzania Global Plan. However, PE can be used to add value to PACE. For example, PE has a role in:

1. Strengthening veterinary services - in disease surveillance and delivery of animal health services
2. Privatisation of veterinary service delivery by:
   - Establishment of links between private vets, other animal health service providers
   - Fostering the involvement of private vets in epidemio-surveillance
3. Rinderpest eradication - clinical surveillance

4. CBPP control and the control of other epizootics (FMD, ND, RVF, ASF). PE can assist:
   - Surveillance
   - Control of livestock movements and improved participation/response in vaccination campaigns
   - Fostering and sensitisation

Overall, PE can enhance livestock owners' participation and ownership of disease control programmes

CAPE can provide technical and logistical support in areas involving PE. The Animal Health Services-Coordination Programme is responsible for improved delivery of animal health services. This includes expansion and proper use of CAHWs under the supervision of vets in pastoral areas.

Specific proposals for immediate application of PE

1. Rinderpest surveillance - support to clinical surveillance (Dec. 2001- July 2002)
2. African swine fever - involving livestock keepers, raising awareness and improving surveillance and control
3. CBPP - surveillance; impact assessment of CBPP (vaccination versus control)
4. Newcastle disease - socio-economic studies

Various activities include research centres such as the Animal Diseases Research Institute (ADRI) and veterinary investigations centers.

Also need to consider veterinary training institutes - CAPE to support curriculum development to include PE in undergraduate and postgraduate training:

- Short course - for epidemiologist/field officers (by December 2002)
- Training of trainers (by April 2002)

Key Players:

- Livestock keepers - associations, groups
- Livestock field officers
- Livestock traders
- Private veterinarians
- DVDS
- VICs and ADRI
- DVS (Epidemiology Unit)
- University/SUA

PACE Uganda

1. Integrate and co-ordinate PE with other surveillance and other epidemiological tools for RDP, CBPP, CCPP, OOR, FMD, ASF, LSD, RVF, rabies and other diseases. Players include MAAIF, National Agricultural Research Organizations, Faculty of Veterinary Medicine and private veterinary practices; timeframe - 6 months.
2. Train 'trainers of trainers' in PE.
3. CAPE facilitates a PE investigation into "Mixed infection syndrome; March 2002.
4. DVOs and MAAIF conduct continuous monitoring and evaluation of community-based surveillance system in Karamoja region.
5. Further development of PE methods in the PACE districts.
6. PE methods will shed light on endemic diseases and syndromes.

PACE Sudan

General roles for PE include:

1. Disease surveillance
2. Disease control
3. Strengthening veterinary services
4. Disease diagnosis
5. Research - centers include:
   - 11 regional vet labs in the regions
   - 3 vet schools
   - veterinary training center (KRT).

Use of PE through CAHWs, local leaders and livestock owners. Activity already practiced in N. Kordofan and Darfur on-going. In the southern sector through FAO, PE is used in the South to find RP outbreaks in infected zones to complement PACE programmes. PE also used during vaccination teams.

PACE Kenya

Roles for PE can be categorized according to three main programmes or players:

A. In the PACE Kenya Programme

1. Envisage PE to improve epidemio-surveillance network through disease surveillance and reporting. Specfically,
   - Rinderpest eradication process
   - Improve the control of other epizootics: CBPP, FMD, RVF, LSD
   - Strengthen private - public sector linkages in delivery of animal health services
2. Will help in the understanding the socio-economics of major epizootics and therefore shape/refine their control strategies
   Our priority areas are the pastoral areas (Zone II & III) and the key players are public vets, NGOs and CAHWs, and private vets. Timeframe - duration of PACE and beyond.

B. In the CAPE Unit

1. Streamlining the delivery of vet services in pastoral areas
2. Streamlining data collection in pastoral areas
3. Linkages within the region

C. Veterinary Schools and Research Institutes

1. Introduce PE in training curriculum

2. Utilize PE in research on animal diseases and program evaluation. Already underway are the following research projects involving PE:
   - Trypanosomiasis in camels
   - CBPP
   - Business planning in Animal Health Services Delivery in pastoral areas

3. Training needs

PACE Ethiopia training needs
Trainees for PE training should be selected from:
- PACE
- Veterinary field services
- Research Institutes
- Teaching Institutes
- NGOs involved in CAHW programmes

Who to train?

Veterinarians, CAHWs and policy makers should all receive training. CAPE should provide training materials and Training of trainers courses.

PACE Sudan training needs

PACE Sudan suggested that initially, a general awareness-raising workshop was required for supervisors and policy makers. Specific PE training events could then follow, particularly to train veterinarians in PE ad apply it in communication, monitoring and evaluation, and data collection and analysis.

CAPE should provide support in the form of training trainers, and resources to assist further training courses in Sudan.

PACE Uganda training needs

Players	Training Needs	Time Scale	CAPE support
MAAIF, Policymakers, PACE staff, Epidemology staff	Awareness in PE TOTs/ advanced	June 2002 March 2002	Logistics Trainers
LG, District staff, Extension workers	Basic PE	Continuous	
Researchers	TOT/Advanced PE	March 2002	“
Private sector, PVPs, NGOs	Basic TOT	Continuous	“
CAHWs	Basic	Continuous	“
Pastoralists	Awareness	Continuous	“

PACE Kenya training needs

Players	Type of training	When?
University lecturers	TOT - PE	In place
University students (undergraduates)	PE	?
Vets in pastoral areas Epidemiologists Key NGO staff	TOT - PE	2002
Other public, NGO, Private, CAHWs extension personnel + VIL teams	PE	2002 and beyond

PACE Tanzania training needs

Players	Training Needs	Time Scale	CAPE support
Training institutes/ veterinary schools	Training of trainers - in new developments of PE; in-depth Curriculum development	April 2002	Financial resources for establishment of short course programme
Research institutes/ Zonal- disease investigation centers	Basic training in PE (short course) Advanced training in PE Research methodologies	April 2002	Financial other resources e.g. Trainers
National Epidemiology Unit/Epidemiologists	Basic and advanced training in PE	April 2002	Financial other resources e.g. Trainers
VICs - zonal vet. Research officers	Basic training in PE	Dec. 2002	Financial Training material
DVOs	Basic training in PE	April 2003	"
Private vets and Livestock Field Officers (LFOs) in the field	Basic training and practice of PE	July 2003	"
CAHWs	On-the- job training	Continuous	"
Livestock farmers	Awareness raising on-farm	Continuous	"
Policy makers	Awareness raising	July 2002	"

It was suggested that general awareness training was also required to familiarise policy makers and farmers.

The role of the CAPE Unit in training was provision of expertise, technical back-stopping and funding.

PACE Somalia training needs

In PACE Somalia, PE training needs included staff in the Somalia Livestock Professional Forum (SLPF), National Coordination Unit, Zonal Coordination Units (4) and Zonal Professional Associations. Private veterinarians under contract to PACE Somalia should also be trained.

Annex 1
Workshop timetable

Day 1
Thursday 15th November

8.30 - 9.00am	Registration of participants
9.00 - 9.30am	Welcome Background and objectives of the workshop
9.30 - 10.00am	Opening speech by Ato Belay Ejigu Vice Minister, Ministry of Agriculture
10.00 - 10.30am	Coffee break
10.30 - 11.30am	Presentation "Participatory Epidemiology: Setting the Scene"
11.30 - 12.30am	Presentation "Livestock keeping and indigenous knowledge in the Horn of Africa: Personal reflections on 25 years experience"
12.30 - 2.00pm	Lunch
2.00 - 3.00pm	Issues affecting the wider use of participatory epidemiology Issue 1. Qualitative verses quantitative methods
3.00 - 3.30pm	Tea break
3.30 - 4.30pm	Issues affecting the wider use of participatory epidemiology Issue 2. Methodological issues
4.30 - 4.45pm	Summary of Day 1

Day 2
Friday 16th November

9.00 - 11.00am	Working Groups by country	
9.00 - 10.00am	Issues affecting the wider use of participatory epidemiology Issue 3. Training and practice Session "The Ideal Qualities of a Participatory Epidemiologist"	
10.00 - 10.30am	Coffee break	
10.30 - 11.00am	Where can Participatory Epidemiology fit into PACE? - Introduction	
11.00 - 12.30am	Improving epizootic disease control using combined participatory and modelling approaches	
12.30 - 2.00pm	Lunch	
	Group 1 *Mainly of interest to PACE epidemiologists involved in epizootic disease control*	Group 2 *Mainly of interest to researchers and academics*
2.00 - 3.00pm	Participatory epidemiology and disease surveillance animal health services	Use of participatory approaches and methods in community-based
3.00 - 3.15pm	Tea break	Tea break
3.15 - 3.45pm	Participatory epidemiology and disease surveillance (continued) opportunities	Participatory epidemiology and research: Experiences and
3.45 - 4.45pm	Participatory Disease Searching veterinary education	Participatory epidemiology and
4.45 - 5.00pm	Summary of Day 2	

Day 3
Saturday 17th November

9.00 - 11.00am	Working Groups by country - Identify opportunities for using PE to complement national PACE Programmes - Describe specific activities in terms of disease problems to be addressed, priority geographical areas and key players to be involved in each activity - Identify training needs related to the above. Who should be trained, how should they be trained? - Outline a work plan for incorporating PE-related activities into each national PACE programme.
11.00 - 11.30am	Coffee break
11.30 - 12.00am	Group presentations - PACE Ethiopia
12.00 - 12.30am	Group presentations - PACE Somalia
12.30 - 2.00pm	Lunch
2.00 - 2.30pm	Group presentations - PACE Tanzania
2.30 - 3.00pm	Group presentations - PACE Kenya
3.00 - 3.15pm	Tea break
3.15 - 3.45pm	Group presentations - PACE Uganda
3.45 - 4.15pm	Group presentations - Sudan
4.15 - 5.00pm	Outstanding issues, Workshop evaluation and close

Annex 2
List of participants

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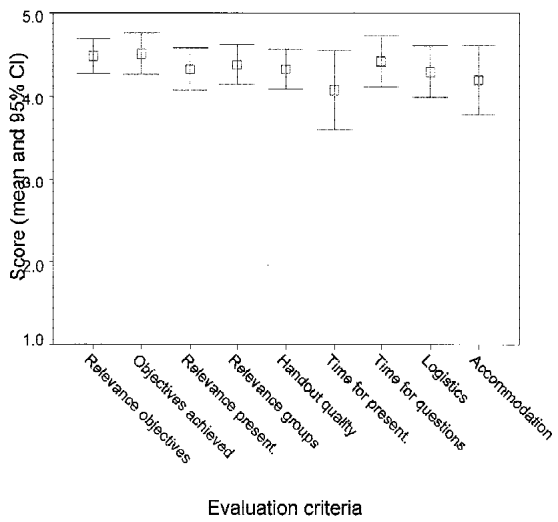
Annex 3 Participants' evaluation of the workshop

Participants were asked to score from 1 (very poor) to 5 (excellent) the following criteria for evaluating the workshop:

- relevance of objectives
- achievement of objectives
- relevance and value of presentations
- relevance and value of group discussions and presentations
- quality and relevance of handouts
- time allocated to presentations
- time allocated for questions and discussion
- general organisation and logistics and for the workshop
- accommodation

Results from 52 respondents are summarized below.



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