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Community participation and the global eradication of rinderpest

SPECIAL ISSUE

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Rinderpest and human livelihoods

Rinderpest is a severe viral disease of cattle and wildlife that can cause near total mortality in its epidemic form. Historically, rinderpest was a disease of Europe and Asia, but the disease was accidentally introduced to eastern Africa at the end of the 19th century by Asian cattle imported to feed colonial armies. The epidemic spread as far as South Africa over the ensuing decade killing up to 90% of the cattle and susceptible wildlife in its path. It is estimated that one-third of the human population of Ethiopia starved to death in the famine that resulted. Rinderpest remained in Africa from that time causing periodic epidemics with severe economic, food security, and social consequences.

The disease is an important concern in international trade. It was eradicated from Europe in the last century and only ever occurred once in the Americas. The world veterinary authority, the Office International des Epizooties (OIE), was founded as a direct result of a rinderpest outbreak in Belgium and Brazil in 1920, caused by an infected shipload of cattle originating from Asia. Countries that have rinderpest infestation experience reduced access to international markets due to health restrictions on exports.

The Global Rinderpest Eradication Programme (GREP)

The Global Rinderpest Eradication Programme (GREP) was established to coordinate and promote rinderpest eradication worldwide. The strategy of the programme is timely eradication in a sustainable and verifiable manner and relies heavily on strategically focused vaccination and epidemiological surveillance. The Food and Agriculture Organization of the United Nations coordinates the global programme. In Africa, GREP works in partnership with the African Union's Pan African Programme for the Control of Epizootics (PACE) that has the regional mandate for rinderpest eradication in Africa.

Only 15 years ago, rinderpest was present throughout large parts of Africa, Asia, and the Middle East. By the early 1990s, rinderpest had been eliminated from West Africa with the help of mass vaccination campaigns. However, areas of East Africa still harboured the disease, particularly remote, pastoral areas. The disease persisted here due to the limited availability of livestock services and insecurity. For a period of about five years progress towards rinderpest eradication appeared to stall.

This paper will trace the evolution of ideas and review some of the lessons learnt as part of the strategic revision of the rinderpest eradication programme. It is a story of progression from top-down institutional design to grass-roots empowerment where dialogue has mobilised communities and professionals to meet both local and international goals.

Calves dying of rinderpest in southern Sudan in the early 1990s. The disease is known for causing high mortality in cattle.

Conventional approaches to rinderpest control and eradication

Technical issues

In theory, rinderpest is an easy disease to eradicate. Animals that recover are immune for life and the rinderpest virus does not survive long outside the body. The virus is transmitted by direct contact between animals. As a result, the disease always needs to find new, susceptible individuals to survive. Vaccination reduces the number of these susceptible animals.

A vaccine developed in the 1960s, called by many the Plowright vaccine, is considered one of the finest animal or human vaccines ever developed and has contributed tremendously to the control of rinderpest. However, the vaccine had one important constraint when used in the developing world – it required a strict cold chain from the point of production in the factory to the cow, in order to keep the vaccine alive and effective. This meant very costly and logistically complicated infrastructure was required to mount control campaigns. Refrigeration facilities, ice machines, cold boxes and fleets of vehicles were all essential. As a result, rinderpest control was difficult to deliver and sustain in the less developed areas. Consequently, places such as remote and extensive pastoral regions, areas of insecurity, and other marginalised areas lingered as reservoirs for the disease.

In 1990, Tufts University and the US Department of Agriculture developed a thermostable rinderpest vaccine (TRV) that utilised the Plowright vaccine virus but improved the preservation process. The vaccine could be transported in the field for up to 30 days without refrigeration. The thermostable vaccine was originally intended as a technical solution to the problem of rinderpest control in remote, marginalised communities.

The vaccine could now be delivered on foot, by horse, camel or bicycle. It could go to places without roads, electricity, generators or kerosene. Only the most basic equipment was required: a syringe, mixing bottle, needles, good water, and salt. Despite all these options, it was difficult for the veterinary establishment to envisage change. Many clearly wished to continue with conventional approaches to vaccine delivery based on government teams working from vehicles, and requiring daily allowances.

Socio-economic issues

As TRV became available in quantity in early 1992-3, field studies were undertaken to examine the options for vaccine delivery to remote pastoral communities such as the Afar of Ethiopia, the Karamojong in Uganda, Nilotic peoples of southern Sudan, and Arab and Fulani communities in eastern Chad. As conventional mass vaccination campaigns had repeatedly failed in these areas, the study team used a participatory approach to understand disease priorities, the dynamics of rinderpest, and the root cause of the repeated failure of vaccination campaigns in each area.

While communities explained how cattle raiding, intertribal conflict and war were common, they also noted how conventional vaccination was offered:

- at inappropriate times relative to grazing schedules and bodily conditions;
- at locations during seasons of high disease and parasitic burden;
- at insecure locations;
- for too short a period of time; or
- not at all in some sub-sections of the community.

Veterinary staff often acknowledged these local concerns but noted that their budgets were woefully inadequate and that when money did become available, it was often at the wrong time of year relative to the farmers' needs. In several countries it was found that government or project accounting cycles determined the timing of campaigns. Teams went to the field, fuel and allowances were spent, but the cattle simply were not there.

It was clear that a major communication gap existed between the livestock owners and veterinary services, which created a loss of confidence on both sides. Veterinary staff were rarely from the local community and often did not have an appreciation of the needs and mobility of the production system, especially in the case of pastoral communities. Also, the community structure, leadership, and conflicts were often not fully understood. Knowledge of entry points for dialogue and decision-making was lacking – veterinary staff often did not realise that services were not offered in a way that allowed livestock owners to utilise them.

Further discussion with livestock owners revealed how

Community-based animal health workers vaccinating cattle in the remote Afar region of Ethiopia

they identified the training of local community members, working under the guidance of the veterinary department, as a good solution for their lack of services. This led to the idea that community-based animal health workers (CAHWs) could be trained in basic animal health care and rinderpest vaccination, using TRV.

Community-based approaches to rinderpest control

Early on it was recognised that for the community to fully own the programme, it was essential that the CAHW system should meet their perceived needs and that they had been influential in its design. When ranking diseases, rinderpest was often ranked third or fourth priority. This was high enough to suggest that CAHWs would be able to address rinderpest, but that other priority diseases needed also to receive attention as far as it was possible to do so. Thus, CAHWs were trained and equipped on five to six other priority issues in addition to rinderpest vaccination.

Livestock owners identified the need for services when and where the cattle were located by mapping. In some communities, specific grazing locations that lacked road access were identified as areas where cattle from several communities gathered. A good example was the swamps of Karamoja. In terms of rinderpest eradication, the remote grazing areas where cattle mixed were also a priority. Segments of the community that utilised these areas were sought out and asked to select trainees.

The preparation of a rinderpest vaccine for injection and the conduct of vaccination sessions requires good technical and organisational skills. The CAHWs were trained by veterinarians in a ten-day course using participatory training techniques, first in the classroom and then in the field. By the end of the training they were able to complete the tasks faultlessly.

"It is a story of progression from top-down institutional design to grass-roots empowerment where dialogue has mobilised communities and professionals to meet both local and international goals"

Evidence of success

When an animal (or person) is vaccinated correctly, the vaccine causes them to develop protection against the disease in question. This protection can take the form of antibodies in the blood of the animal, which neutralise the disease agent should the animal become infected. One way to measure the success of rinderpest vaccination is to check how many animals have produced antibodies. Therefore, vaccinations done by the CAHWs were assessed objectively at a number of project locations using blood samples collected from cattle before and after vaccination, and measuring antibody levels at these two points in time.

Under practical conditions, it is generally recognised that an 80% vaccination success rate reflects good work. For the most part, conventional vaccination campaigns achieve between 70-80% success rates; some are lower. It was found that CAHWs performed at least as well as the professional services. In fact, in the CAHW programmes that were evaluated after blood testing, all had success rates of over 80%.

Some key lessons learnt

The importance of dialogue

The more time that was invested in dialogue before training CAHWs, the greater the likelihood of smooth implementation and success. For example, experience showed that commitment to cost recovery, a key tenet of the programmes, was weak when communities were told of the rationale and agreed to it after only brief discussion. Much greater success was achieved through repeated meetings where problems were posed in activities such as role-playing and communities identified their own responsibilities.

Literate or illiterate CAHW trainees?

Many educated stakeholders felt that literate CAHWs were required in order to read drug and vaccine labels and instructions. However, the project found that literate trainees were over-qualified for the task. Often they accepted the training as a stepping-stone to higher life goals. Within six months, they had moved on. On the other hand, non-literate CAHWs were committed livestock owners firmly anchored within the

Example of a problem picture used in CAHW training courses

traditional way of life and their communities. They were very proud to be CAHWs and had no trouble mastering the issues when training materials were prepared in pictographic form.

Seeing is believing

The thought of CAHWs conducting rinderpest vaccination was a concern in conservative professional circles. For some, this reflected a perceived threat to job security; in others it was an issue of the quality of service. Both were valid concerns that needed to be addressed. Considerable effort was invested in consulting veterinary stakeholders and in some cases, several years passed before pilot trials could be conducted. The key was to assure close monitoring and supervision of all CAHWs by formally trained veterinary cadres and to design programmes with economic benefits for all stakeholders including formally trained veterinary staff.

Despite positive technical reports and laboratory studies, many decision makers still remained sceptical. The real turning point came when policy makers got out to the field, interviewed participants and saw the CAHWs in action. The impact of field trips and study tours was truly remarkable. Years later, the Director of the Interafrican Bureau of Animal Resources of the Organization of African Unity humorously described one field trip as something akin to 'a religious experience.' Perhaps, it was at this point that decision makers developed a sense of ownership.

Community-based approaches to rinderpest surveillance

In order to accomplish and sustain rinderpest eradication, vaccination programmes are followed by rinderpest surveillance. This involves stopping vaccination and being vigilant in case of disease resurgence. In order to verify the eradication of rinderpest from a particular country, a set of international guidelines has been drawn up by the OIE. These guidelines outline minimum surveillance requirements that each participating country must meet in order to receive international recognition of freedom from rinderpest. In essence these standards are designed to ensure that countries have adequate systems in place to find rinderpest, if it were present.

Box 1: Participatory Disease Searching

Participatory disease searching (PDS) is an inductive process of disease investigations. In the case of rinderpest, PDS can accomplish four basic goals:

1. find rinderpest if it is present, or provide evidence that it was present in the past;
2. understand the way that rinderpest survives in a particular community;
3. describe the epidemic cycle; and, thereby,
4. help to identify effective intervention methods adapted to local conditions.

Participatory disease searching is a hunt for disease. It has many similarities to good detective work where one starts by identifying the key witnesses and interviewing them as to what they saw. Every witness is interviewed and the testimony is weighed for credibility and compared with the accumulating body of evidence. The attitude of the interview team is one of respect for all views combined with critical review. Just as in good detective work, direct observations are made and physical evidence, such as samples for laboratory investigation, is collected. The results of observations and tests are interpreted together with the oral testimony in group discussions by the PDS team, a multi-disciplinary team including a veterinary and epidemiologists trained in PRA methods.

Participatory disease searching is a targeted undertaking, but it is important that the process is not undertaken in a leading manner. The PDS team usually presents the study as a general assessment of animal health and initiates interviews by asking general questions on animal health. If the respondents mention the target disease, the information can be followed up by probing questions and visualisation, ranking and scoring techniques.

Progressive veterinarians have long realised that pastoral livestock keepers often know a great deal about animal diseases. Participatory methods are increasingly being used and developed to make best use of this local knowledge for rinderpest surveillance. Although this might be viewed as an extractive use of the methods, rinderpest is nearly always regarded as a devastating disease by livestock keepers and if possible they also want to eradicate the problem.

The techniques of participatory rural appraisal offer key adjuncts to laboratory-based epidemiology. Normally, pastoralists have a very well developed knowledge of clinical diagnosis based on symptomology and patterns of transmission, particularly in regard to major epidemic diseases such as rinderpest. They can very accurately recount the local history regarding rinderpest and often are the first to recognise and report the disease. The problem is that all too frequently nobody listens. *(FAO, 1996)*

One of the benefits of CAHW networks is improved communication links between livestock owners and the veterinary establishment. As pastoralists and veterinarians establish productive relationships, each group learns from the other. Although a lot remains to be done, most veterinary services are now more aware of the livelihood systems and the animal health status of pastoral areas than they were ten years ago. The mere presence of viable delivery systems adapted to local conditions improves disease surveillance.

In the process of setting up CAHW networks, it was realised that directly interviewing livestock owners on the presence and history of rinderpest in their communities would greatly expand our understanding of the disease situation. This technique was termed participatory disease searching (Box 1). In high-risk areas, both GREP and PACE have undertaken field studies that improved and in some instances revolutionised the understanding of rinderpest field epidemiology in professional circles.

Over the last decade, networks of CAHWs have been created in many parts of Africa and Asia. These networks, although endorsed by the veterinary services, are frequently housed within development projects, emergency relief efforts or NGOs. They are ready-made disease information networks but due to an absence of appropriate policies and frameworks, are not directly linked to national surveillance efforts. CAHW networks present a low-cost opportunity to respond to farmers' reports with effective interventions tailored to surveillance information. In the Horn of Africa, efforts are now underway to develop stronger links with non-governmental and private CAHW networks for official disease surveillance tasks.

Conclusion

Community-based animal health approaches have made a considerable contribution to the global eradication of rinderpest. The combination of appropriate technology, community participation, and international rinderpest eradication gave programmes a broad-based appeal that attracted the attention of communities, governments, NGOs, international agencies, universities, research facilities, and donors. Such a diverse range of organisations invariably brings together a motley assortment of individual perspectives. The process has resulted in a significant exchange of ideas and an increased understanding of the need for alternative methods to meet a common goal.

No one involved doubts the need for strong conventional veterinary capacities. However experience has shown that they are not enough to do the job in traditional production systems. Programmes must respond to the livestock owners' needs in order to succeed and this means that an element of local control must be included. More than just sterile technical data must pass up the chain of command. The paradox and continuing challenge is how to effectively combine the two approaches yet it is certain that CAHWs can be effective eyes, ears, and hands at the service of communities and conventional veterinary services.

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REFERENCES

FAO, 1996. 'Outreach to Marginalised Communities. The World Without Rinderpest.' *Food and Agriculture Organization Animal Production and Health Paper 129*, Rome, FAO.