Veterinary para-professionals in supplying animal health services, in particular for surveillance and early warning

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1. Introduction

Although livestock are a major asset for rural households throughout the developing world, many areas are characterised by limited or no accessibility to veterinary services. It is increasingly recognised that one useful approach to improving primary-level veterinary service delivery and disease surveillance in rural areas of developing countries is the use of community-based animal health workers (CAHWs) (Catley et al., 2004a; Peeling and Holden, 2004; Roger et al., 2004). Selected by their communities and receiving training in the prevention or treatment of a limited range of animal health problems, these veterinary para-professional workers can act as the link between livestock keepers and government disease surveillance systems (Mariner, 2002; Mariner et al. 2002).

Community-based animal health workers are members of a community and therefore they are on-site to act more quickly to animal health needs compared with veterinarians. With careful training and with the support of official veterinary services\(^1\), CAHWs can be equipped to diagnose and treat basic health problems, assist with the collection of samples for disease surveillance, rapidly report outbreaks and provide data for veterinary research. Veterinary-supervised CAHW delivery systems have proven to be useful for improving both disease surveillance and disease control in under-served areas. They can contribute to animal identification systems, tracing systems and animal movement control systems. They play an important role in mobilising and informing communities about animal health issues. In remote, nomadic and transhumant communities, CAHWs move with herds to remote grazing areas and continue to provide basic services. They offer the opportunity to coordinate animal health surveillance and control across extensive grazing areas. They make cost effective and unique contributions in border areas, across frontiers and areas of insecurity where activities of conventional service providers are often highly restricted or prohibited.

This paper provides an overview of experiences with the use of CAHWs in Africa and focuses on recent developments related to disease surveillance and official recognition of CAHWs at national and international levels.

2. The need to improve national animal disease surveillance: how can CAHWs contribute?

According to the OIE Terrestrial Animal Health Code (OIE 2003), animal disease surveillance data is of fundamental importance for countries wishing to engage in international livestock trade. Surveillance systems can also contribute towards the identification of disease priorities at national or sub-national levels, and lead to prompt recognition of emerging disease problems (Mariner, 2003).

In Africa, examples of CAHW-type surveillance systems include programmes in Somalia (Baumann, 1990), Sudan (Jones et al., 1998) and Ethiopia (Admassu, 2002). Even CAHWs with

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\(^1\) As per the OIE Code the authors define “official veterinary services” as the Veterinary Administration, all the Veterinary Authorities, and all persons registered or licensed by the veterinary statutory body.
limited formal education can be trained how to complete basic monitoring forms and report outbreaks of important diseases to the nearest veterinarian or a veterinary para-professional with more training. Unlike other cadres of veterinary worker, CAHWs often travel long distances on foot or by rudimentary, but appropriate forms of transport. Ideally, these workers are supervised by veterinarians or other veterinary para-professionals such as diploma or certificate holders and this supervision is central to the licensing and quality control of CAHWs (Catley et al., 2004a).

Although the use of CAHWs has often been a controversial issue and resisted by veterinarians, the OIE Code provides a useful framework for assessing how CAHWs can complement official veterinary services (Box 1.).

2.1 Sensitivity and representativeness of surveillance

In many developing countries, the establishment and maintenance of nationwide animal disease surveillance systems is a major challenge. Important constraints include the need to access remote, often large areas characterised by poor infrastructure and communications, and with limited financial resources. Structural reform programmes during the last 30 years or so have tended to reduce the capacity government to implement surveillance systems that provide national coverage. The operational budgets and transport facilities of official veterinary services have been contracting over the last decades and this trend is unlikely to change.

Veterinary para-professionals such as CAHWs usually work in areas where veterinarians are unwilling to live and work. These areas may lack the services that professionals expect for themselves and their families, and where financial rewards for either public or private sector veterinarians are perceived to be limited. In order for surveillance systems to function, regular contact is required with livestock owners. At the present time, networks of CAHWs exist throughout Africa and these individuals are well placed to act as the ‘eyes and ears’ of a conventional surveillance system, and can greatly enhance the sensitivity and representativeness of the system (Mariner 2002; Mariner et al. 2002).

In Tanzania, government epidemiologists and VetAid (a non governmental organisation) tested the use of CAHWs in a passive disease reporting system in pastoral and agropastoral districts in the north of the country (Allport et al., 2004). The CAHWs in the trial received training in disease...
reporting and were provided with reporting formats. Reports were to be submitted to government-employed Livestock Field Officers who in turn, submitted reports to the District Veterinary Officer (DVO). The DVO then submitted reports to the regional veterinary investigation centre. The CAHWs received no financial incentives for reporting. The trial was conducted over an 18-month period and the results were dramatic. Disease reporting in the three trial districts of Monduli, Babati and Simanjiro with CAHWs was substantially higher than in any other district in the region (Fig. 1). The Tanzania trial also showed how CAHWs can increase the geographical coverage of a reporting system (Table 1).

Figure 1
Livestock disease reporting by districts with and without CAHWs in Arusha region, Tanzania, during an 18-month trial period (source: Allport et al., 2004)

Table 1
Geographical coverage before and after the use of CAHWs (source: Allport et al., 2004)

<table>
<thead>
<tr>
<th>District</th>
<th>Area covered</th>
<th>Proportion of district covered</th>
<th>Area covered</th>
<th>Proportion of district covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monduli</td>
<td>3,535km² (5 LFOs)</td>
<td>25%</td>
<td>16,261km² (5 LFOs; 18 CAHWs)</td>
<td>100%</td>
</tr>
<tr>
<td>Simanjiro</td>
<td>2,121km² (3 LFOs)</td>
<td>11%</td>
<td>15,548km² (3 LFOs; 10 CAHWs)</td>
<td>78%</td>
</tr>
<tr>
<td>Babati</td>
<td>3,535km² (5 LFOs)</td>
<td>58%</td>
<td>14,847km² (5 LFOs; 16 CAHWs)</td>
<td>100%</td>
</tr>
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Note: the three trial districts with CAHWs are shown in green; districts without CAHWs are shown in red or blue.

CAHW - Community-based Animal Health Worker; LFO - Livestock Field Officer
Basic workers such as CAHWs not only report passively, but also can be useful active disease reporters (Box 2).

<table>
<thead>
<tr>
<th>Box 2</th>
<th>Community animal health workers as reporters of disease outbreaks (Mariner, 2002)</th>
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<tbody>
<tr>
<td></td>
<td>There are examples of field-level reports from CAHWs providing the first indication of important disease outbreaks. In some cases, the diseases in question were of major international importance. For example:</td>
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<td></td>
<td>- In Karamoja, Uganda in 1994 and Eastern Equatoria, southern Sudan in 1998, CAHWs provided the first news of rinderpest outbreaks to their supervisors. This information was then transmitted to programme veterinarians who were able to visit the areas in question, collect samples and confirm the presence of rinderpest. This unsolicited action of CAHWs in remote areas can play a crucial role in identifying the remaining foci of rinderpest in the final stages of eradication programmes.</td>
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<tr>
<td></td>
<td>- In Ethiopia in 1996 an unknown respiratory disease of camels was first reported by an Afar CAHW to local PARC authorities. The CAHW provided the first indication that a mysterious respiratory disease was affecting camels in the area. This disease subsequently spread through Ethiopia, Somalia and northern Kenya.</td>
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2.2 Specificity of surveillance: the importance of indigenous veterinary knowledge

It has been widely reported in the veterinary literature, over many years, that some livestock keepers in Africa have good diagnostic skills. Also, many diseases of international importance (such as rinderpest and foot-and-mouth disease) present with fairly characteristic clinical signs. This local resource is sometimes termed ‘ethnoveterinary knowledge’ and there is a very rich literature describing how pastoralist and agropastoralist herders characterise and name diseases (McCorkle et al., 1996). Also, herders often know how diseases are transmitted and recognise the importance of sick or apparently healthy livestock and wildlife in disease outbreaks (Martin et al., 2001). Although much of the ethnoveterinary literature is qualitative, recent reports of herder diagnoses of epizootic diseases include quantitative assessments. For example, the positive predictive values of Somali herders’ diagnosis of rinderpest and Maasai herders’ diagnosis of FMD were 60% and 73% respectively at herd level (Mariner and Roeder, 2003; Catley et al., 2004b). According to Mariner and Roeder (2002), this compares favourably with positive predictive values for clinical diagnoses made by professional clinicians in the USA. Such quantitative assessments are particularly useful considering the scientific principles of the OIE Code.

Ethnoveterinary knowledge is particularly relevant to CAHWs, because the selection and training of CAHWs should be based on this indigenous resource (Akabwai et al., 1994). The more effective CAHW training courses use participative training techniques that recognise and build on trainees’ existing knowledge (Iles, 2002). Various reports show that the clinical diagnoses made by well-trained and monitored CAHWs are sufficiently valid to contribute to surveillance. Working in central Somalia, Baumann (1990) showed significant correlation between CAHW reports of contagious caprine pleuropneumonia and laboratory diagnosis of the disease. Other reports of CAHW diagnostic validity are available from Tanzania (Magayane et al. 2001; Allport et al, 2004) and Kenya (Rubyogo et al., 2004).

3. Quality control of CAHWs at national level

One of the underlying principles of the chapter of the OIE Code dealing with the evaluation of quality of official veterinary services is that services should be auditable and have clear lines of communication and management. It follows that if CAHWs are to be used for official surveillance tasks then they should be legally recognised and controlled. Although in many countries CAHWs have been isolated from official veterinary services, substantial progress has been achieved in the last five years. Specifically, some countries have reformed policies and legislation to support
privatised and veterinary-supervised veterinary para-professionals including CAHWs, and further institutionalised this, through the creation of central government units dedicated to the regulation and co-ordination of community-based animal health delivery systems.

These processes have been complemented by support for primary animal health care systems by AU/IBAR and the OIE (Sones et al. 2002). In 2003 AU/IBAR published guidelines on CAHWs including quantified indicators for assessing quality of training and performance, as detailed in Annex 1. In May 2004, the OIE General Assembly approved changes to the Code to improve recognition of the role of veterinary para-professionals. The OIE ad hoc group examining these issues felt that “while all veterinary para-professionals needed to work under the responsibility and direction of a licensed/registered veterinarian, the tasks authorized for each category of para-professional should be defined by the veterinary statutory body of each Member Country, depending on qualifications and training, and according to need. Categories of para-professionals include veterinary nurses, veterinary technicians, community-based animal health workers, food inspectors, livestock inspectors and others depending on national terminologies”.

4. Challenges and Solutions

4.1 Veterinary privatisation and surveillance

It is increasingly recognised that CAHWs should be private sector operators who work under the supervision of private animal health technicians or veterinarians (Catley et al., 2004a). In this situation, the CAHWs derive financial incentives from the provision of preventive and clinical services, which are priced according to the principles of any small business. The commercial viability of these small businesses in some of the most remote and under-served areas of Africa are being documented and supported with increasing frequency (Rubyogo et al 2004, IBAR 2003 & 2004).

Although there are substantial opportunities for government to support privatisation through contracting out surveillance tasks to the private sector, a general trend in Africa is the retention of all surveillance tasks within government departments. This is an important constraint, because contracts from government can be crucial for ensuring the financial performance of private veterinary facilities, particularly in marginalised areas. Although many countries have privatisation policies (in either written or unwritten form), failure to contract out relevant public sector tasks to the private sector continues to be a key factor in hindering privatisation and results in poor performance of surveillance systems.

This contradiction between privatisation aims and the management of surveillance tasks illustrates the importance of viewing surveillance as a component of a wider set of veterinary service policies and strategies. Furthermore, the objectives of surveillance need to be carefully defined in order to justify the costs.

4.2 The need for monitoring and timely feedback

According to Mariner et al. (2002) the sustainability of a surveillance system relates to the perceived benefits of the system among livestock keepers. There has been a tendency for epidemiologists to view surveillance as a one-way flow of information and this leads to frustration among field-level workers and communities. On the ground, people often do not see the benefits of surveillance and do not know how information provided by them is used. Unless there is a two-way flow of information, surveillance systems can easily grind to a halt.

At community level, surveillance systems should have built-in feedback mechanisms. For example, veterinary workers should be able to provide regular disease information updates to communities in the form of verbal briefings or newsletters. Although such activities appear to be relatively simple, they are often overlooked when designing and costing surveillance, or are only evident when
surveillance is supported by external funding. Regular refresher training of CAHWs is a good opportunity to share new information with both CAHWs and livestock keepers.

4.3 Improving links between CAHWs and official veterinary service surveillance systems

Although these ideas look straightforward on paper, experience shows that monitoring of CAHW is one of the weakest aspects of CAHW projects (Catley, 2002). In NGO projects in pastoralist areas, monitoring can be hindered by the physical distances between NGO offices and the areas where CAHWs are actually working, and this is sometimes compounded by insecurity. Monitoring costs in terms of staff time and transport costs are often under-estimated or forgotten altogether. These projects can also be isolated from government in terms of reports from NGOs to government. Here the fault lies on both sides – whereas NGOs may not voluntarily report to government, local or national government officers seem to insist on such reports. Mariner et al. (2002) look at these problems in some detail:

“In many cases, CAHW networks are not implemented by veterinary services, but by separate lines within the government, projects or non-governmental organizations. Even with the best efforts on all sides, institutional barriers can be difficult to bridge. One approach to promoting effective communication and collaboration is participatory leadership forums where representatives of the various governmental, project and NGO based programs come together to establish common goals and approaches through dialogue. In addition, field visits to expose decision makers and surveillance workers to the benefits of community-based work that includes surveillance activities would be an appropriate approach as well.

Even when CAHWs are identifying serious disease outbreaks, their reports may not be heard, or may become lost within other more routine monitoring information.

In the case of disease outbreaks, a typical CAHW training course includes training in history taking and basic clinical examination of sick livestock. Therefore, CAHWs obtain useful information on disease outbreaks that can be passed on to formal veterinary workers. Such information does not necessarily have to be written down by the CAHW, who may be illiterate, but can be passed verbally to the monitor.

When a CAHW reports the occurrence of a serious disease outbreak, the monitor should report this event separately from the routine monitoring mentioned above. It is usually advisable for the monitor to investigate the event using a combination of participatory techniques and conventional disease investigation and sampling procedures. Such an approach requires the monitor to collect the testimony of several livestock owners, and if possible inspect some cases. If the disease reported is subject to an official eradication or control programme, such as rinderpest or CBPP, the monitor should comply with any special reporting requirements. In some countries, specific report registries exist for rinderpest and all livestock owner and CAHW reports should be recorded in these registries along with the results of follow-up. If triangulation supports the nature of the report, the monitor, or the concerned CAHWs, should immediately inform district authorities and request a disease investigation.

Disease reports from the field may be misinterpreted through misunderstanding of local usage of disease terms. Community-based programmes normally construct lexicons of disease terms and these documents should be made generally available. National surveillance staff should have an inventory of documents covering the EVK of all communities in the country. They actually serve as the case definitions for reporting purposes in the specific communities were they were constructed. In the event that lexicons
are not available from all major livestock owning cultures, surveillance staff should conduct participatory surveys to complete the gaps and when necessary, use conventional veterinary investigation and surveillance approaches”.

As suggested by Catley et al. (2004a), official recognition of CAHWs should facilitate better linkages between CAHWs and government reporting systems. Several countries in the Horn of Africa have recently taken this step by establishing “Community-based Animal Health Units” within official veterinary services.

5. Conclusions

The responsibility for effective surveillance rests with government veterinary services and therefore so does the need to ensure the quality and supervision of CAHWs, plus appropriate linkages between CAHWs and government reporting systems. Private sector CAHWs working under private veterinarians or diploma-holders appears to be an appropriate way to delivery services in poorer areas. Such private operators need to fall under better and enabling government rules. In some countries government veterinary services and regulatory bodies have established, or are in the process of establishing supportive policies and legislation for CAHWs. Ultimately, such approaches will assist countries to demonstrate auditable and well-managed veterinary services, and sensitive, specific and responsive surveillance systems according to OIE guidelines.

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References


Annex 1

AU/IBAR Indicators for the Assessment of Community-based Animal Health Workers (CAHW) within Veterinary Services

Introduction

The following indicators are designed to assist Veterinary Authorities to assess the coordination, quality and monitoring of CAHWs. The indicators can be adapted to the particular needs and resources of a given country. However, according to the principles of the OIE Code a Veterinary Administration should be able to describe and demonstrate how personnel, resources and procedures are arranged in order to ensure adequate control of para-professionals such as CAHWs.

The indicators assume that at field level:

a. specified government veterinary officers act as veterinary inspectors on behalf of the statutory body;
b. the immediate supervisors of CAHWs are either veterinarians or cadres of para-veterinary professionals with higher qualifications than CAHWs and who are authorised by the statutory body to act as CAHW supervisors.
c. CAHW supervisors may be positioned in either the private or public sector.

1. General indicators for the coordination and control of CAHWs by Veterinary Authorities

In order to demonstrate effective coordination and control of CAHWs, a Veterinary Authority should refer to the following indicators:

1.1 The Veterinary Authority should assign community-based animal health delivery system (CAHS) coordination and quality control tasks to named officers at central level and these tasks should be detailed in the job descriptions and performance assessment procedures for these officers.

1.2 The role and specific tasks of CAHWs should be defined in veterinary regulations of the statutory body.

1.3 The statutory body should delegate field-level CAHW supervisory and quality-control tasks to government veterinary officers. Clear written procedures should exist for the specific CAHW supervisory and regulatory tasks to be performed by these officers.

1.4 A procedure should exist for ensuring that all proposals for new CAHW projects by non-governmental organisations, private vets and governmental agencies are screened by the Veterinary Authority to ensure adherence to quality control indicators and minimum standards (as devised by the Statutory Body in collaboration with the Veterinary Authority). Specifically:

1.4.1 The Veterinary Authority should establish and maintain a relationship with the government agencies responsible for registration of non-governmental organisations and approval of proposals by these agencies. All proposals with an animal health component should be evaluated by the Veterinary Authority.

1.4.2 In some countries, non-agriculture or livestock government agencies establish CAHW systems in isolation of the Veterinary Authority. The Veterinary Authority should establish and maintain a relationship with these agencies and ensure that all proposals with an animal health component are evaluated by the Veterinary Authority.

1.4.3 Proposals for new CAHW projects that are assessed to be of sufficient standard should form the basis of a Memorandum of Understanding between the Veterinary Authority and the implementing agency.

1.4.4 The Veterinary Authority should ensure that all donors, non-governmental organisations and relevant government agencies are informed about the requirements for the establishment of CAHW systems. Written guidance on these requirements should be disseminated to all relevant organisations and agencies annually.
2. Indicators for the inspection of CAHW training courses

Veterinary inspectors nominated and trained by the Veterinary Authority and the Statutory Body are responsible for ensuring that CAHW training courses are designed and implemented according to the following indicators:

2.1 Training and registration of CAHW trainers
The Veterinary Authority should ensure that any person training CAHWs is registered as a CAHW trainer by the statutory body. The required academic qualifications of CAHW trainers should be defined by the statutory body and trainers should have themselves been trained in participative training techniques.

2.2 Use of a national CAHW curricula
Training of CAHWs should be based on a national CAHW curriculum that is endorsed by the statutory body. A participative training methodology should be used. The national CAHW curriculum should comprise a standardised component required by all CAHWs, and a location-specific component to account for variations in the livestock disease situation in different ecological zones and production systems.

2.3 Ratio of trainers to trainees
The number of trainees per trainer should not exceed 15 trainees.

2.4 Location of training
The training should take place in the location to be covered by the CAHWs and near to the communities they will serve.

2.5 Duration of training
The duration of training will depend on the national CAHW curriculum but should not be less than 14-21 days for the initial training course and 5-10 days for subsequent refresher courses.

2.6 Use of translators
The use of translators during training should be avoided; training should be conducted in the mother language of the trainees.

2.7 Practical content of the training
At least 50% of the training duration should consist of practical sessions. The practical sessions should include use of livestock for clinical examinations and practising the use of treatments or vaccines under the supervision of the trainer(s).

2.8 Examination of CAHWs
The statutory body should endorse the use of a standardised procedure for the examination of CAHWs. In line with the national curricula, the examination will comprise a standardised component for use with all CAHWs and a location-specific component according to disease problems in specific areas. The examination should comprise oral interviews with CAHWs to assess knowledge and practical tasks to assess skills. Each CAHW should be asked the same questions and requested to demonstrate the same practical skills. The examiners should include the registered trainer and the CAHW supervisor. Certificates should be issued to qualified CAHWs by a veterinary inspector.

3. Indicators for monitoring CAHWs

3.1 Post-training assessment
A post-training assessment of CAHWs should be conducted by a veterinary inspector between two and four months after the initial training course. This assessment should comprise:

3.1.1 Assessment of CAHW knowledge and skills using a similar standardised methodology to the examination of CAHWs developed under indicator 2.8.

3.1.2 Standardised interviews with CAHW supervisors to cross check results obtained from 3.1.1.

3.2 Routine monitoring of CAHWs
3.2.1 CAHWs should provide, in person, a completed reporting format to their supervisor on a regular basis. The frequency of reporting shall depend on operational factors but should not be less than every two months.

3.2.2 CAHW supervisors should compile CAHW reports and submit to a veterinary inspector on a regular basis. The content of these reports should be defined by the statutory body in consultation with the Veterinary Administration.

3.3 All CAHWs shall receive refresher training at least once per year. The refresher training should be assessed by a veterinary inspector according to the training indicators listed under ‘2. Indicators for the inspection of CAHW training courses’. 
Note on definitions

*Veterinary Administration* means the governmental *Veterinary Service* having authority in the whole country for implementing the animal health measures and international veterinary certification process which the OIE recommends, and supervising or auditing their application.

*Veterinary Authority* means a *Veterinary Service*, under the authority of the *Veterinary Administration*, which is directly responsible for the application of animal health measures in a specified area of the country. It may also have responsibility for the issuing or the supervision of the issuing of *international veterinary certificates* in that area.

*Veterinary Services* means the Veterinary Administration, all the Veterinary Authorities, and all persons registered or licensed by the veterinary statutory body.