

## Assessment of the Technical Competence and Ethical Behaviour of Community-based Animal Health Workers in Mwingi District, Kenya

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### ABSTRACT

This paper describes an assessment of the technical competence and ethical behaviour of Community-based Animal Health Workers (CAHWs) in Mwingi District, Kenya. From 99 trained CAHWs, 40 participated in the study. Using a pre-tested semi-structured questionnaire, direct observation of the relevant veterinary drug kits and participatory discussions, the study team found that the CAHWs knowledge of clinical signs of local livestock diseases and notifiable and zoonotic diseases and their ability to use veterinary drugs correctly and safely were adequate. Marks were awarded to the candidates according to an agreed marking scheme between the CAHWs' trainers and study team members. The results showed that, overall, 36 out of 40 (90%) of the sampled CAHWs passed the tests. The existence of a referral system for CAHWs and refresher trainings helped to ensure that CAHW competence and ethical behaviour were maintained. However, it was also found that some areas of the current curriculum required more detailed input based on field experience. The CAHW system could serve as an alternative animal health care system in areas lacking veterinary services.

*Keywords:* community-based animal health workers, competence, ethical behaviour, Kenya

*Abbreviations:* AHA, Animal Health Assistant; AHSD, Animal Health Service Delivery; AHSP, Animal Health Service Provider; CAHW, Community-based Animal Health Worker; DVA, District Veterinary Authority; JAHA, Junior Animal Health Assistant

### INTRODUCTION

Some critics of Community-based Animal Health Worker (CAHW) systems (mainly veterinary surgeons) believe that CAHWs lack the necessary skills, knowledge and ethical behaviour to be entrusted with prescription drugs and to provide basic animal health care. It is argued that CAHWs give unnecessary and wasteful treatment, resulting in losses to livestock producers and development of resistance to antibiotics and residues in animal food products (Dasebu *et al.*, 2003), thereby compromising the sale of animal food products in international and possibly in local and regional markets.

In Mwingi District of Kenya, 99 CAHWs have been trained and linked to relevant institutions and stakeholders (Rubyogo *et al.*, 2003). All the CAHWs have been active for at least 2 years and some of them have been working since 1992. However, no systematic study has been carried out to assess their technical competence. This study aimed to determine their competence and that the study findings were intended to assist decision makers in formulating veterinary service delivery policies in under-served areas. The following aspects were selected for evaluation of the CAHWs: their use of drugs, technical competence and ethical behaviour, possession and status of basic veterinary equipment, and referral of cases considered to be beyond their technical abilities.

## MATERIALS AND METHODS

A questionnaire was used to collect information from CAHWs, Animal Health Assistants (AHAs) and livestock owners (questionnaire available from the lead author). Out of the 99 CAHWs working in Mwingi District, 40 were randomly selected from a list provided by the District Veterinary Authority (DVA). Since AHAs are the lowest level of Animal Health Service Providers (AHSPs) acceptable to the critics of the CAHWs system, it was considered that their competence in clinical diagnosis and treatment alone be used as a control for comparison of that of the CAHWs. Seven AHAs who were divisional heads were used for this comparison. Thirty-four of the 40 CAHWs sampled were men and 6 were women. Female CAHWs comprised 10% of the 99 CAHWs. Two hundred and fifty livestock owners from five community groups in five divisions were selected randomly through community meetings and participated in group discussions. Of these, 85 were selected by their respective communities (based on village representation in the location) to be respondents to the questionnaire. Nineteen (23%) of the livestock keepers were female and 66 (77%) were male. The questionnaire was pre-tested on two CAHWs, two AHAs, and five livestock owners and its content was then adjusted accordingly. The research team members administered all questionnaires, and no other enumerators or translators were used. The questionnaire focused on issues related to the competence and ethical behaviour of CAHWs.

For issues on clinical knowledge, both CAHWs and AHAs were tested by asking them to list five common cattle and goat diseases in their operational areas and to give three major signs for each disease in both animal species. This section carried 40 marks. Answers pertaining to questions on notifiable/reportable diseases, zoonotic diseases, ticks, and tick-borne disease and their control were allotted 3, 12 and 7 marks, respectively. A marking scheme that took into consideration the CAHW training curriculum, their field experience and their language capacity was prepared jointly by an independent veterinary surgeon who was a member of the study team and another person who had participated in training CAHWs. Although due consideration was given to the training manual used during the CAHWs training, adequate leeway was allowed to reflect any knowledge acquired on diseases in the field.

All aspects pertaining to competence and ethical behaviour in the semi-structured questionnaire were assessed by direct inspection of CAHWs' veterinary drug kits. CAHWs' competence and ethical behaviour were also assessed through question-answer sessions between the study team and individual CAHWs. They were rated using a four-point category of scores: don't know/have = 0 marks; poor = 1 mark; good = 2 marks; and very good = 3 marks. The aspects evaluated comprised:

- Drug usage in relation to public health concerns, including drug residues, withdrawal period and container disposal. This aspect was tested by asking for appropriate advice that should be given to farmers in relation to edible animal products (food items) after the dispensation of certain drugs such as antibiotics. The maximum score for this was 12.
- Drug usage in relation to dosage issues, comprising reading and interpretation of drug labels, estimation of cattle weight, dosage of antibiotics and other drugs. This was marked out of 11.
- Drug usage in relation to storage, which involved the physical checking of the presence of the expired drugs, discoloured tetracycline and drugs exposed to sunlight. This was marked out of 12.
- Presence of essential drugs and appropriate equipment and their usage: e.g. thermometer reading and use of common disinfectants. This was marked out of 12.
- The case referral system was assessed by obtaining direct answers to questions pertaining to the handling of difficult cases from respondent CAHWs. It was considered that this was an indicator of ethical behaviour among CAHWs since it would recognize higher expertise in the provision of animal health service delivery.

#### *Secondary data*

In addition to the questionnaire and participatory group discussions, other information related to the above-mentioned areas of assessment was collected through CAHWs' daily case and drug use records and the DVAs' reports in order to cross-check the information provided. Records on drug use were assessed by direct inspection of available records from each CAHW. These were compared with the records available at the DVA office, which was considered to be a control. It was marked out of 6.

## RESULTS

### *Technical competence of CAHWs and AHAs*

The maximum score achievable by a candidate would have been 115 marks and a pass mark was 57.5 marks. The test areas, the maximum achievable for each area and the corresponding pass marks can be summarized into six major divisions as shown in Table I. The mean score for each division and the proportion of CAHWs passing any one division are shown in the table. On average, 90% of CAHWs passed this test.

TABLE I  
Overall CAHWs score distribution on quality of services

Topic (total marks/pass mark)	Mean score	Percentage of CAHWs passing the test
Clinical signs of disease (40/20)	22.0	67.5
Notifiable/reportable diseases (3/1.5)	2.4	90.0
Zoonotic diseases (12/6)	4.0	52.5
Veterinary drug and equipment usage (47/23.5)	30.5	93.0
Ticks and tick-borne disease control (7/3.5)	4.9	88.0
Drug use record keeping (6/3)	3.2	72.5
Total (115/57.5)	70.8	90.0

### *Knowledge on clinical signs of disease*

The maximum achievable score for this area and the pass mark were 40 and 20 marks, respectively. Table II summarizes the scores for both cadres of AHSPs. About 67.5% of CAHWs and all AHAs passed the test.

### *Knowledge and practice on veterinary drug usage, residues, withdrawal periods and veterinary equipment*

The maximum score achievable in this combined area was 47 marks with a pass mark of 23.5. Table III summarizes the overall percentage of CAHWs achieving various scores. Thirty-seven CAHWs (93.5%) passed the test in this combined area. Although the majority passed on individual test categories, a poor performance (43% of CAHWs passed) was noted in the area related to the transmission to clients of information on drug residues and withdrawal period.

**TABLE II**  
Comparative assessment of CAHWs' and AHAs' knowledge on clinical signs of disease

Score	Percentage of workers achieving score	
	CAHWs ( <i>n</i> = 40)	AHAs ( <i>n</i> = 7)
10–14	7.5	0
15–19	25.0	0
20–24	27.5	14.3
25–29	27.5	42.9
30–34	12.5	42.9
35–40	0	0
Total	100.00	100.0

**TABLE III**  
Test score distribution for CAHWs' knowledge and use of veterinary drugs and equipment usage

Score	Number (%) of CAHWs achieving score (%)
18–23	3 (7.5)
24–29	13 (32.5)
30–35	19 (47.5)
36–41	4 (10)
42–47	1 (2.5)
Total	40 (100)

*Knowledge and practices about reportable and zoonotic diseases*

Thirty-six (90%) of the CAHWs were able to convey relevant information to the appropriate veterinary authorities in their areas of operation on reportable/notifiable diseases. When asked to name three zoonotic diseases, to state how they were contracted and to give methods of their prevention, only 21 CAHWs (52.5%) passed this section of the test. Thus a large proportion of the CAHWs were weak in this later area.

### *Knowledge on ticks and tick control*

This section included knowledge of the correct dilution of acaricides and handling of used containers. Thirty-five CAHWs (87.5%) passed the test.

### *Record keeping*

Twenty-nine CAHWs (72.5%) out of 40 had records that were reliable and thus passed the test. Although the majority of CAHWs passed, a few CAHWs need to be reminded of this vital aspect of service provision.

### *Referral system*

CAHWs often referred difficult cases to AHAs, and Figure 1 gives an overview of the type and frequency of case referral. The distance to the referral points, i.e. where the nearest AHA could be reached, ranged from 4 to 40 km, with the majority (70%) of CAHWs referring to a distance of between 4 and 20 km.

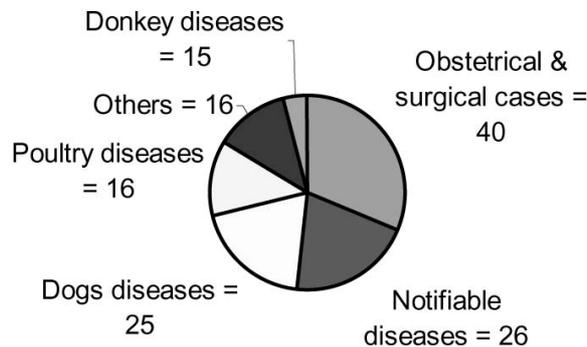


Figure 1. Types and numbers of cases referred by CAHWs ( $n = 40$ )

## DISCUSSION

Service quality is a major component of the AHSD system. The quality of service is not only a professional and ethical issue, it also relates to a service-marketing strategy, service sustainability and customer satisfaction.

The majority (90%) of the CAHWs in the study sample were judged to be competent in providing services with the required diagnostic skills, ethical behaviour (including post-treatment follow-up) and correct use of drugs and equipment. Although profes-

sional veterinary associations and other bodies often express concern that CAHWs use drugs incorrectly, thereby inducing development of drug resistance (IDL Group and McCorkle, 2002), our findings do not support these views. Even with an initial training period of only 14 days duration followed by refresher courses, CAHWs were found to be competent. However it must be realized that the AHSD tasks performed by the CAHWs involved minor interventions such as deworming, and treatment and control of tick-borne, pneumonic and diarrhoeal diseases. Hence, CAHW training, together with the refresher courses, appears to be sufficient to impart the hands-on knowledge and skills required to treat these minor animal health problems. This agrees with the recommendations of Iles (2002). Indeed, 67% of CAHWs passed a competency evaluation test that was passed by all AHAs. Out of the top seven in the competence test for both CAHWs and AHAs, four were CAHWs who had been in the field for between 2 and 6 years. Of these four, only one had junior secondary education (Form II) the remaining three had completed their primary education (Class VIII). Therefore, neither educational level nor work experience compromised the AHSD competence and skills of CAHWs. This concurred with requirements demanded by livestock owners that a CAHW should be able to read and write. It is our recommendation that these criteria be strictly adhered to when choosing individual CAHWs for training. Participatory approaches based on sound adult learning were used in their training as recommended by various authors (e.g. Iles, 2002) and it appears that it has been very useful in imparting adequate competence and skills needed for their work.

A major concern by veterinary surgeons about the use of CAHWs as AHSD personnel has been the belief that they would be responsible for creating high levels of drug residues in food products, thereby compromising their marketing locally, regionally and internationally. If knowledge of the effects on these drugs on the human food chain is taken as an indicator of the concerns of the CAHWs themselves, then our study contradicts this belief, since over 93% of interviewed CAHWs showed adequate knowledge in this area. The fact that only 43% of CAHWs informed their clients about the danger of drug residues in their animal products destined for human consumption was considered to be due to this issue not being given sufficient prominence during training.

The CAHWs were able to give correct dosages of most antimicrobial drugs in their possession. Hence, microbial resistance is unlikely to be of concern. Taylor (2003) indicated that both microbial resistance and residues in human food are due to livestock owners themselves deciding not to continue with treatment once their animals show response to initial treatment and also marketing their treated animals before the indicated withdrawal periods. This problem cannot be solved by condemnation of the CAHW system; it is necessary to educate livestock owners about the importance of adhering to AHSPs' advice. Alternatively, test centres should be available where food products can be examined and premiums paid to livestock owners whose products do not contain antimicrobial residues. However, the practicability of this idea in developing countries is subject to debate.

Local, regional and international trade in animal products is hampered by the occurrence of trans-boundary (reportable) and zoonotic animal diseases. Immediate recognition, reporting and action by veterinary authorities on these diseases require

adequate manpower. In Mwingi District there are only three veterinary surgeons (all based in the headquarters) supported by 15 AHA and JAHAs at the divisional level, thus the location and sublocation levels have no formal AHSD personnel. The area is currently covered by the CAHWs. Ninety per cent of the interviewed CAHWs in the district had adequate knowledge and skills to identify trans-boundary diseases. They would therefore be able to facilitate control and reporting of these diseases. It should be noted that CAHWs played a significant part in the eradication of rinderpest in Ethiopia by their regular reporting on the disease (Mariner, 2002). Over half (52.5%) of CAHWs had adequate knowledge on zoonotic diseases and their handling. It was interesting to note that this area was viewed as a non-profit-making activity by CAHWs. This area is covered by the meat inspectorate division of the formal veterinary system and is not adequately covered in the CAHWs' training. None the less, further training of CAHWs is recommended in this area to augment the work of meat inspectors.

Referral systems and refresher training of CAHWs are useful ways to maintain and improve diagnostic capacity and use of drugs and thereby limit the emergence of drug resistance (Taylor, 2003). Both a referral system and refresher training were features of the CAHW system in Mwingi District. CAHWs in Mwingi District referred cases they considered to be beyond their ability, an indication of recognition of the limit of their technical competence and of their appreciation of veterinary ethics. Further evidence of their adherence to ethics was noted in their record keeping, where 73% possessed quality records. Nevertheless, improvement in this area was considered desirable and more effort in the DVAs inspectorate system is required to inculcate this.

Although both the initial and refresher trainings were relevant to their day-to-day field experiences of CAHWs, there is a need for further training on diseases of poultry and of non-food producing animals (donkeys and dogs). In the area of general field practice, need was expressed for further training on minor surgical and obstetrical procedures and in basic pharmacology, with particular reference to problems related to drug use. Also of importance in further training was the finding that some trainers (AHAs) admitted inadequate knowledge in the areas where the CAHWs thought they had been improperly instructed. Thus, there is a need to improve the knowledge of trainers in order to improve the competence and ethical suitability of the CAHWs.

One privately practising veterinarian would need to cover an area currently covered by at least 25 CAHWs in order to derive efficient income. This may not be feasible in a subsistence livestock production system where owners are unwilling to pay for certain services, including transport costs. Hence, the CAHWs are likely to play an important role in the provision of animal health services for the foreseeable future.

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### **Évaluation des compétences techniques et du comportement éthique d'une équipe de prestation de conseils sur la santé des animaux basée dans la communauté dans le district de Mwingi, au Kenya**

**Résumé** – Cet article décrit une évaluation des compétences techniques et du comportement éthique de prestataires de conseils sur la santé des animaux (CAHWs) basés dans la communauté dans le district de Mwingi, au Kenya. Sur 99 CAHWs formés, 40 ont participé à l'étude. En utilisant un questionnaire semi-structuré, une observation directe des trousseaux de médicaments vétérinaires pertinentes et des discussions participatives, l'équipe de l'étude a constaté que les connaissances des CAHWs des signes cliniques des maladies du bétail local et des maladies devant être déclarées obligatoirement et zoonotiques et leur aptitude à utiliser des médicaments vétérinaires correctement et avec sécurité étaient adéquates. Des notes ont été décernées aux candidats selon un barème de notation convenu entre les formateurs des CAHWs et les membres de l'équipe de l'étude. Les résultats ont mis en évidence que globalement, 36 sur 40 (90%) des CAHWs échantillonnés avaient réussi aux tests. L'existence d'un système d'orientation pour les CAHWs et les formations assurées à des cours de recyclage ont permis de s'assurer que les compétences des CAHWs et le comportement éthique étaient préservés. Il a toutefois été observé que certains domaines du programme d'études actuel nécessitaient des connaissances plus détaillées, basées sur une expérience acquise sur le terrain. Le système des CAHWs pourrait servir de système de soins de la santé des animaux alternatif dans les zones où les services vétérinaires font défaut.

**Evaluación de la competencia técnica y del comportamiento ético de los trabajadores de la sanidad animal comunitarios en el distrito de Mwingi, Kenia**

**Resumen** – Este informe describe una evaluación de la competencia técnica y del comportamiento ético de los trabajadores de la salud animal comunitarios (CAHWs, en inglés) en el distrito de Mwingi, Kenia. De 99 CAHWs entrenados, 40 participaron en el estudio. El equipo de estudio halló, mediante un cuestionario probado previamente y semi-estructurado, mediante la observación directa de los botiquines médicos veterinarios pertinentes y mediante charlas participativas, que el conocimiento de los CAHWs de los signos clínicos de las enfermedades del ganado local y las enfermedades observables y zoonóticas, y sus habilidades para utilizar correctamente y con seguridad los medicamentos veterinarios eran adecuados. Se concedieron puntos a los trabajadores sometidos a estudio de acuerdo con un esquema de puntos acordado entre los preparadores de CAHWs y los miembros del equipo de estudio. Los resultados mostraron que, en general, 36 de 40 (90%) de los CAHWs estudiados pasaban las pruebas. La existencia de un sistema de remisión para CAHWs y de cursos preparatorios para refrescar los conocimientos ayudaban a asegurar que la competencia y el comportamiento ético de los CAHWs se mantuvieran. No obstante, también se encontró que algunas áreas del actual currículum requerían una contribución más detallada basada en la experiencia de campo. El sistema CAHW puede servir como sistema de asistencia médica animal alternativo en áreas que carecen de servicios veterinarios.