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# Control of contagious bovine pleuropneumonia: Knowledge, attitudes, perceptions and practices in Narok district of Kenya

S.W. Kairu-Wanyoike[a,b,*,1], H. Kiara[a], C. Heffernan[b], S. Kaitibie[a,2], G.K. Gitau[c], D. McKeever[d,3], N.M. Taylor[b]

[a] International Livestock Research Institute, P.O. Box 30709, 00100 Nairobi, Kenya
[b] University of Reading, Whiteknights, P.O. Box 217, Reading, Berkshire RG6 6AH, UK
[c] Faculty of Veterinary Medicine, University of Nairobi, P.O. Box 29053-00625, Nairobi, Kenya
[d] Moredun Research Institute, Pentlands Science Park, Bush Loan, Penicuik, Midlothian EH26 0PZ, Scotland, UK

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ABSTRACT

CBPP is an important transboundary disease in sub-Saharan Africa whose control is urgent. Participatory data collection involving 52 focus group discussions in 37 village clusters and key informant interviews, a cross-sectional study involving 232 households and a post-vaccination follow up involving 203 households was carried out in 2006–2007 in Narok South district of Kenya. This was to investigate knowledge, attitudes, perceptions and practices (KAPP) associated with control of CBPP as well as the adverse post-vaccination reactions in animals in order to advice the control policy. The community perceived trans-boundary CBPP threat to their cattle. They had traditional disease coping mechanisms and were conversant with CBPP prevention and control with 49.8% (95%CI: 42.8–56.7%) giving priority to CBPP control. However, 12.9% (95%CI: 9.0–18.1%) of pastoralists had no knowledge of any prevention method and 10.0% (95%CI: 6.5–14.7%) would not know what to do or would do nothing in the event of an outbreak. Although 43.5% (95%CI: 37.1–50.2%) of pastoralists were treating CBPP cases with antimicrobials, 62.5% (95%CI: 52.1–71.7%) of them doubted the effectiveness of the treatments. Pastoralists perceived vaccination to be the solution to CBPP but vaccination was irregular due to unavailability of the vaccine. Vaccination was mainly to control outbreaks rather than preventive and exhibited adverse post-vaccination reactions among 70.4% (95%CI: 63.6–76.5%) of herds and 3.8% (95%CI: 3.5–4.2%) of animals. Consequently, nearly 25.2% (95%CI: 18.5–33.2%) of pastoralists may resist subsequent vaccinations against CBPP. Pastoralists preferred CBPP vaccination at certain times of the year and that it is combined with other vaccinations. In conclusion, pastoralists were not fully aware of the preventive measures and interventions and post-vaccination reactions may discourage subsequent CBPP vaccinations. Consequently there is need for monitoring and management of post vaccination reactions and awareness creation on CBPP

* Corresponding author at: International Livestock Research Institute, P.O. Box 30709, 00100 Nairobi, Kenya. Tel.: +254 722 568 510.
*E-mail addresses:* swwanyoike@yahoo.com (S.W. Kairu-Wanyoike), h.kiara@cgiar.org (H. Kiara), c.heffernan@reading.ac.uk (C. Heffernan), kaitibie@qu.edu.qa (S. Kaitibie), gkgitau@uonbi.ac.ke (G.K. Gitau), dmckeever@rvc.ac.uk (D. McKeever), n.m.taylor@reading.ac.uk (N.M. Taylor).
[1] Current address: Ministry of Agriculture, Livestock and Fisheries, Kenya, Department of Veterinary Services, P.O. Kangemi, 00625 Nairobi, Kenya.
[2] Current address: College of Business and Economics, Qatar University, P.O. Box 2713, Doha, Qatar.
[3] Current address: The Royal Veterinary College, Hawkshead Lane, North Mymms, Hatfield, Hertfordshire AL9 7TA, UK.

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prevention and interventions and their merits and demerits. CBPP vaccine was largely unavailable to the pastoralists and the preference of the pastoralists was for vaccination at specified times and vaccine combinations which makes it necessary to avail the vaccine in conformity with the pastoralists preferences. In addition, planning vaccinations should involve pastoralists and neighbouring countries. As the results cannot be generalized, further studies on CBPP control methods and their effectiveness are recommended.


## 1. Introduction

Contagious bovine pleuropneumonia is an important disease of cattle caused by *Mycoplasma mycoides mycoides* Small Colony variant (*MmmSC*) (Radostits et al., 2000). The livelihoods of about 24.4 million people in 19 African countries (1.3 million in Kenya), 30–50% of who live below poverty levels, are at risk from the effects of CBPP (Thomson, 2005). In Kenya, CBPP is present in the Karamoja ecosystem bordering Uganda and Southern Sudan, the Somali ecosystem in the eastern part of the country and in the Maasai ecosystem in the south. Over a 10 year period, the incidence of CBPP in Kenya was 2.8% and 12.7% in endemic and epidemic situations respectively and up to 47% in the event of sporadic outbreaks (Wanyoike, 1999) following mass screening of animals.

The options for control of CBPP include cattle movement control and quarantine, stamping out, test and slaughter, treatment and vaccination with T1 vaccines (Radostits et al., 2000). CBPP can disappear from a country with adequate movement control (Newton and Norris, 2000). However, movement control is difficult and often impractical because of need for transhumance, trade, socio-cultural practices, civil strife and inadequate veterinary personnel (Wanyoike, 1999; Windsor, 2000). Thus levels of movement control consistent with sustainable pastoral livelihoods are unlikely to have a major impact on CBPP prevalence (Mariner et al., 2006a).

Stamping out has been termed as the simplest and surest way to control and eradicate CBPP. However, stamping out has far reaching socio-economic effects (Le Gall, 2009). Consequently, it is recommended that stamping out should be a strategy of last resort to be used in critical epidemiological situations such as in the case of outbreaks in a free area or the surveillance zone (of a sanitary cordon) or on major trade routes. It can also be introduced at a later stage of the campaign after substantial reduction of CBPP incidence such that the incidence is approaching zero (FAO, 1997).

The test and slaughter method was extensively used in the clearing of CBPP from the Kenya Maasailand. However, test and slaughter of animals can be a lengthy and difficult process in the absence of adequate quarantine (Scudamore, 1975) although there are cases in which it has been successful when backed by strict movement control to avoid re-introduction of the disease (Wanyoike et al., 2004). CBPP can be eradicated if infected animals are detected at meat inspection, the disease traced back, suspected herds tested and positives slaughtered (Santini, 1998). However, the test and slaughter method may fail in the absence of compensation (Thomson, 2005).

Treatment of affected cattle with antimicrobials has been officially discouraged on the basis that it may favour the creation of chronic carriers which are believed to be responsible for disease spread (FAO, 1967). However, the method may be of use as it reduces mortalities and bacterial burden (Huebschle et al., 2006). Unfortunately there is still not sufficient evidence that sequestra will not break down to cause clinical disease (FAO, 2007) although Huebschle et al. (2006) and Nicholas et al. (2007) have cast doubt on clinical disease emanating from such sequestra. This leaves vaccination as the most practical control option (Tulasne et al., 1996).[4]

The OIE recommends T1 vaccine strain for vaccination against CBPP. It is generally accepted that the protection offered by the vaccine wanes after 12 months (Wesonga and Thiaucourt, 2000) but may last for more than one year (Nkando et al., 2011). However, to reach a herd immunity level of 80% and above for adequate CBPP control, there is a need for biannual vaccination as primal vaccination leads to only 67% protection rate at three months while revaccination at six months leads to 95.5% protection rate (Wesonga and Thiaucourt, 2000). The vaccine is sufficiently avirulent but can cause severe post-vaccinal adverse reactions in some breeds (Teshale, 2005).

The measurement of knowledge, attitudes, perceptions, and practices in control of a disease is important for generating information that can be used in policy advice (Thomson, 2005; McLeod and Rushton, 2007; Heffernan et al., 2008). Although CBPP is known to be an important disease in sub-Saharan Africa, information on pastoralist knowledge, attitudes, perceptions and practices in CBPP control is scanty. This study, which was part of a wider study which explored the use of a modified vaccine in CBPP control (Mtui-Malamsha, 2009; Wanyoike, 2009) was undertaken to close these gaps.

## 2. Materials and methods

### 2.1. Selection of the study area

The Mara and Loita divisions of Narok South district (Fig. 1) were chosen as the study sites firstly because, of the 16 CBPP outbreaks recorded in the infected area in Kenya in the period preceding the study, 11 (68.8%) were in Narok district; principally in Mara and Loita divisions (Wanyoike, 2009). Secondly, the knowledge base of the Maasai (the

[4] This however, is for countries whose policy is largely control at present as opposed to those in the process of eradication where the control methods of stamping out and movement control may be more appropriate (OIE, 2008).