Examining the use of antimicrobials by pastoralists in Narok county, Kenya

Chloë Donovan

The county of Narok in South-western Kenya is best known internationally for its Masai Mara National Reserve and the Great Wildebeest Migration- one of the seven natural wonders of Africa. Outside of the Mara, Narok is a strongly pastoral county, with livestock farming contributing 10% of Kenya’s GDP.

From my observations, the livestock farming practices in Narok vary considerably, from traditional nomadic type farming to zero grazing dairy production. The majority of the farms, or more accurately homesteads, were free grazing herds, travelling by foot each day to shared resources such as water and minerals, and enclosed in a boma by night. The western constituency of Kilgoris was an exception, with the pastoralists generally using a fenced grazing set-up.

There are an estimated 3,673 lions in the Serengeti/Masai Mara system. Livestock predation by Lions, as well as Hyenas and Leopards, can cause significant losses.
Rearing livestock in Narok presents many challenges. The climate ranges from dry and unforgiving to flood-prone; the land is overstocked creating disputes over territory; disease transmission is catalysed by free grazing and markets; and the abundant indigenous wildlife act as pathogen reservoirs (e.g. Malignant Catarrhal Fever, shed by calving Wildebeests) and predators.

It is nationally recognised that surveillance of agricultural antimicrobial usage and resistance is inadequate. Upon arrival on the ground, there was collective concern amongst veterinarians, who shared anecdotes about unregulated, inappropriate use by pastoralists.

For the fieldwork of this project I was attached to the NGO VetAid Kenya, a small team of local vets who work across the county and beyond to provide healthcare for livestock, as well as working to provide animal health training and programmes to benefit food security in the region. During my time with them in March/April their main focus was on an East Coast Fever (ECF) immunisation programme supported by the International Livestock Research Institute (ILRI).

I visited 22 pastoralists, where I conducted interviews with the aid of a local vet acting as an interpreter, speaking with various members of the households in order to piece together an accurate picture of their disease control practices and their perspectives regarding the most important challenges affecting the health of their animals. Concurrently, I visited eight Agrovet outlets, where I recorded the veterinary medicines stocked by each store, and

Buffalo are implemented in the ‘Corridor Disease’ form of ECF, in which they transmit the haemoparasites to cattle resulting in an acutely fatal disease.

Livestock keepers obtain their veterinary medicines independently, making surveillance challenging.

An ‘agrovet’ outlet, from which pastoralists are able to procure veterinary medicines, in this case run by reputable veterinarians. Photo included with permission from the owners.
used whichever means were available - written records, seller's estimates, or receipts – to estimate the sales of each product.

Due to the independent way in which pastoralist procure veterinary drugs and treat their animals, in order to influence usage their source of advice should be identified and targeted. The primary reason (8 out of 15) given for antibiotic choice was due to recommendation from the seller. All pastoralists I spoke to told me they bought their veterinary drugs from Agrovet stores, and so it is reasonable to presume that the stock and sales are representative of the needs of the local clientele. There is anecdotal evidence that some drug sellers use the outdoor markets (*masoko*) but they did not seem to be trusted.

I found the most commonly sold antibiotics were Oxytetracyclines (10%, 20%, and 30% formulations) making up 48.58% of estimated monthly sales, and Beta-lactams (mostly Penicillin-Streptomycin combinations) which made up 34.68%. All bottles I inspected were well within date, and were stored appropriately. However, several pastoralists and
vets expressed concerns that some sellers would hide expired drugs to sell to less aware customers.

The WHO Strategy for Containment of Antimicrobial Resistance\textsuperscript{5} stresses the importance of prescribers of human medicines to “optimize prescribing patterns”, but recognises a number of complicating factors which have a heavier influence on what is sold. For example, inadequate knowledge of microbiology, which leads to excessive use of broad spectrum drugs (in this case, Tetracyclines and Penicillin/Streptomycin combinations); lack of diagnostic support (according to the vets I met with, culture and sensitivity testing is rarely done outside of research); fear of bad clinical outcomes (several vets explained that clients typically attempted empirical treatment, often trying multiple products before seeking veterinary advice by which point there would be little a vet could do, which led to further loss of faith in them and a negative cycle); and economic incentives (I found there to be a wide range of products in most Agrovets, many of which were chemically the same. I was informed there are an increasing number of pharmaceutical companies operating in Kenya, who take advantage of the extensive market).

\textit{On the left, a mixed sheep and goat flock in Siana, being treated with anthelmintics. On the right, we interview a pastoralist in Loita.}

One of the categories of information I focussed on in my interviews was the specific clinical applications of the antibiotics by pastoralists. The WHO recognises 3 categories in which antibiotics are used; treatment, prophylaxis, and growth promotion\textsuperscript{5}. The Global Antibiotic Resistance Partnership (GARP)\textsuperscript{4} analysed antibiotic use in Kenya and concluded that growth promotion was not a primary use; 90% of uses were considered therapeutic, yet it was unclear how accurate this figure was due to interviewees blurring the line between treatment and prevention. My data concurred - for example, 10\% Oxytetracycline was predominantly used as a first line antibiotic for non-specific disease, and several specific clinical signs such as pneumonia and diarrhoea were stated. However, several viral diseases were treated with antibiotics, and there was apparent prophylactic use such as in cattle fatigued after a long journey, or goat kids at certain times of year. There seemed to be confidence amongst vets that antibiotics were regularly
used illogically, and the data I collected appears to agree to an extent; due to the small sample size questionable responses would need to be investigated further before verifying them as legitimate problems.

Due to lack of culture and sensitivity testing, and the fact that the majority of diagnoses are made by the livestock keepers themselves without examination by a veterinarian, the vast majority of treatments are by definition empirical. Even if an animal presents with pathognomic signs or in such a way that the clinical picture can be diagnosed beyond reasonable doubt, it seems reasonable to assume that as this is herd medicine that a confident diagnosis can result in a bias when it comes to treating clinically similar animals.

In addition to antibiotic use, I also collected data regarding use of anthelmintics, acaricides, trypanocides, vaccines, and non-pharmaceutical methods of preventative health measures used by pastoralists. I am hoping that this reconnaissance will provide base line data for future efforts to monitor veterinary drug use and influence livestock disease control in rural Kenya.

References

1. Narok County Government website, link: http://www.narok.go.ke/about-narok

