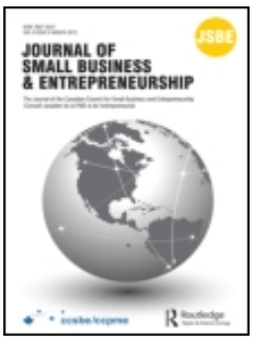

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Entrepreneurship Initiatives in the Control of Sleeping Sickness: Experiences of the Stamp Out Sleeping Sickness (SOS) Initiative in Uganda

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ABSTRACT. Since January 2008, five young veterinarians have been engaged in promoting drugs and chemicals that can help control sleeping sickness, a disease that affects the rural poor in Uganda. The framework involves veterinary service provision at a small fee and has evolved into young graduates setting up veterinary drug shops and practices in the villages, resulting in the promotion of use of products known to help reduce the spread of sleeping sickness. This manuscript describes how fresh graduates who participated in the Stamp Out Sleeping Sickness campaign—a public good implemented by the Faculty of Veterinary Medicine at Makerere University—led to the establishment of small businesses in a community that was just recovering from armed rebellion. The article explains through the use of tables and figures the performance in terms of sales of the small businesses and benefits of the owners in a community that was short of the vital services. The young veterinary graduates have established veterinary drug shops, including the promotion of key people in these small villages trading in chemicals helpful in the control of sleeping sickness by training them to serve as spray persons. The paper discusses the successes and challenges of strengthening the small business model as a sustainability measure in the control of neglected zoonotic diseases like sleeping sickness. The experiences gained have showed that sustainability of disease control in rural communities can be achieved through helping professionals establish a network of small businesses that increase the accessibility of the innovative technologies developed.

RÉSUMÉ. Depuis janvier 2008, cinq jeunes vétérinaires font la promotion de médicaments et de produits chimiques qui contribuent au contrôle de la maladie du sommeil, une maladie qui affecte les pauvres des régions rurales de l'Ouganda. Le cadre prévoit que les soins vétérinaires soient offerts à des frais minimes. Le cadre a évolué au point où de jeunes diplômés établissent des pratiques vétérinaires dans les villages et promeuvent l'utilisation de médicaments reconnus pour prévenir la maladie du sommeil. Cet article décrit la façon dont la campagne pour éradiquer la maladie du sommeil, un service public établi par la faculté de médecine vétérinaire de l'Université Makerere, à laquelle de nouveaux diplômés ont participé, a donné lieu à l'établissement de petites entreprises dans une collectivité qui se remettait tout juste d'une rébellion armée. L'article indique à l'aide de tableaux et de figures la performance en terme de ventes et de profits de ces petites entreprises dans une collectivité qui manquaient de ces services essentiels. Ces jeunes vétérinaires nouvellement diplômés ont établi des cliniques vétérinaires où l'on vend divers médicaments et ont formé des gens du village pour devenir « vaporisateurs » et pour vendre des produits chimiques qui contrôlent la maladie du sommeil. De plus, l'article examine les réussites et les défis associés au renforcement du modèle de gestion des petites entreprises en tant que mesure viable pour le contrôle des zoonoses négligées telles que la maladie du sommeil. Les résultats obtenus indiquent que le contrôle des maladies de façons viables dans les collectivités rurales peut se faire en aidant les professionnels à établir un réseau de petites entreprises qui facilite l'accès aux nouvelles technologies innovatrices qui sont développées.

Introduction

Sleeping sickness is a tsetse-transmitted disease that mainly affects people living in certain tsetse-infested parts of sub-Saharan Africa, where some 60 million people in total are considered to be at risk. In Uganda, by 2002, the spread of sleeping sickness had been associated with the cattle reservoir and cattle restocking exercise (Fèvre et al., 2001). The restocking was being carried out in all areas that were recovering from the armed rebellion

as a strategy to improve on household income and nutrition. The biggest challenge was that several studies had confirmed the fear that the cattle being restocked were responsible for the spread of sleeping sickness to these communities (Welburn et al., 2001; Waiswa, Olaho-Mukani, and Katunguka-Rwakishaya, 2003; Picozzi et al., 2005). Since cattle had been blamed for the epidemic, the entry point in containing the spread was to use trypanocidal drugs like *diminazene aceturate* that had been proved to be effective at treating *T.brucei* s.l. infections in cattle (Clausen et al., 1999). In addition, the live bait technology in tsetse control had been documented as an ideal tool in the control of Glossina fuscipes fuscipes (Okiria et al., 2002), which is the major vector for sleeping sickness in the T.b. rhodesiense endemic areas of Uganda (Waiswa et al., 2006). The major challenges were: 1) the huge human resource that was needed to undertake the treatment; and 2) achieving sustainability in the use of the control technologies since the problem was especially acute in an area where public extension services had been destroyed by war. The Faculty of Veterinary Medicine at Makerere University provided the perfect opportunity to deal with the problem through deploying its final-year students and the young fresh graduates for sustainability of the control activities in an initiative code-named "stamp out sleeping sickness" ("SOS").

This manuscript has been aimed at documenting the success of the small veterinary drugs shops and practices that have helped in sustaining the sleeping sickness control activities that were initiated and introduced to the community under the SOS initiative.

Methodology

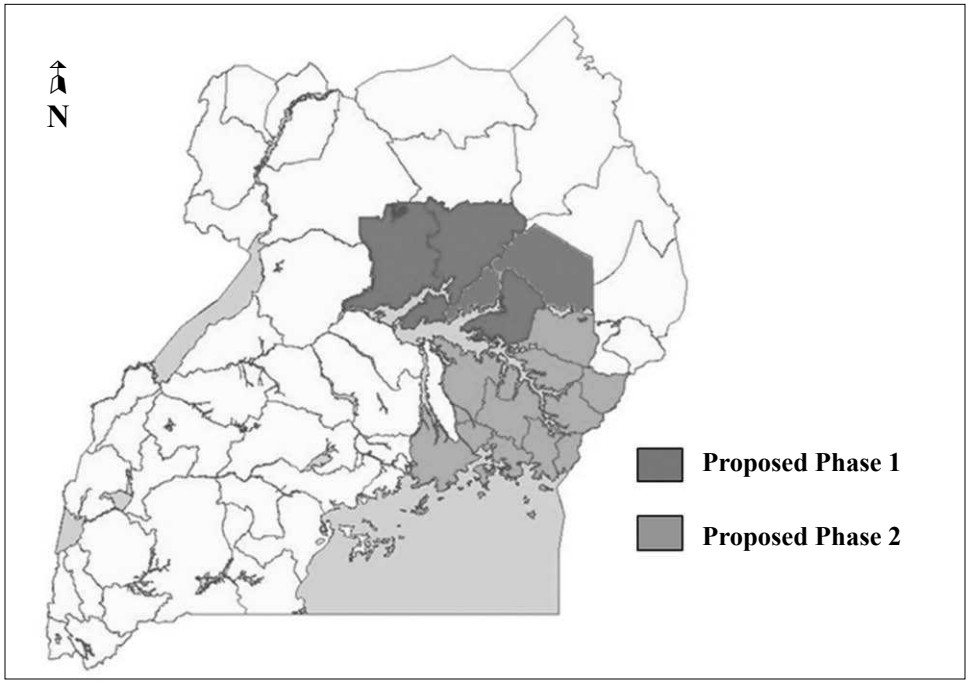
Stamp Out Sleeping Sickness (SOS) control area

A meeting was held in Entebbe in May 2006 that resulted in a proposal that the pool of human resources at the Faculty of Veterinary Medicine at Makerere University was to be used for the intervention to control the spread of sleeping sickness in Northern Uganda. This would involve targeting treatment and spraying of approximately 220,000 cattle with *diminazene aceturate* (Veriben B12®, Ceva Santé Animale ("CEVA") and deltamethrin (Vectocid®, CEVA). The area where the SOS initiative in Uganda started is indicated in Figure 1.

Identification of business opportunity: Normally, interventions for disease control had previously not been perceived as a role that could be undertaken by an academic Institution like Makerere where, like in many traditional institutions, the ivory tower mentality had come to prevail and the role was left to the Ministry of Agriculture frontline field extension staff. The Northern Uganda community was just recovering from armed rebellion and the community was facing serious challenges of public service delivery. Allowing the university's final-year veterinary students to participate in the sleeping sickness control activities enabled them to observe the business opportunities related to animal health available also in remote rural areas, as many of the villages were located 70-100 kilometres away from the nearest shop dealing in veterinary farm inputs. Moreover, for sustainability of the free treatments with *diminazene aceturate* and spray with deltamethrin, the community would need to continue to use these chemicals, which they could not otherwise easily access, as there were no agrochemical shops easily reachable by bicycle—the commonest means of transport. The creation of small veterinary drug shops and practices as part of building a broader distribution chain were identified as a suitable entry point in self-employment of the veterinary graduates.

Engagement of the private sector: The drugs/chemicals and spray used for the free treatment and related funding of activities were provided by CEVA/IK/IKARE through a

Figure 1. SOS Phase I and Proposed Phase II areas on map of Uganda.



local company (High Heights Services Limited ("HHS")), which, although involved in the veterinary supplies business, had not until now considered the area at risk as a good market for the veterinary inputs, as it believed it to be too small and unstable. However, feedback from the student teams showed that, once awareness was created regarding sleeping sickness, its causes, its effects on humans and animals, and prevention methods, there was demand for the products used to target control of sleeping sickness, as cattle owners had observed them to be beneficial to the health of the animals as well as having significant impact on control of ticks. Many farmers were keeping cattle 70-100 kilometres from the nearest veterinary drug shop, and 30 out of 46 fresh graduates who had participated in the SOS activities applied for support from HHS to help them establish the veterinary drug shops and practices.

Business model for sustainability of SOS activities: The willingness of the cattle owners to pay for the products and that of the fresh veterinary young graduates to establish themselves in business provided the perfect opportunity to pursue a business model that would enable the community to pay for the control of sleeping sickness. CEVA/IK/IKARE accepted to work in partnership with HHS to help five young veterinarians establish veterinary drugs shops and practices. In addition, these veterinarians identified persons in these small villages establish themselves as spray persons, providing additional access points for cattle owners to procure the needed drugs and chemicals within a distance of no more than 10 km. Preparation and implementation of the set up started in May 2008, although the actual licensing of the veterinary drug shops was only achieved in January 2009.

Each of the five young veterinarians was advised to create partnerships with at least 15 local young people who would become part of the control activities, in as much as they

would undertake commercial spraying of cattle for a small fee of US$0.10 per head of cattle. The restricted application technology (RAP, Andrew Brownlow unpublished) was promoted, as this would enable these local village sprayers to procure deltamethrin at a cost of US$0.05 per animal and remain with US$0.05 to cover their labor and any related costs. Each young veterinary shop owner was to train and help each of their 15 local partners reach out and spray a minimum of 50 heads of cattle per day for 20 days a month. This allowed each village spray person to spray 1,000 cattle a month and earn US$50 (US$0.05 x 1,000). This would enable the treatment of 75,000 cattle (5 x 15 x 1000) with deltamethrin spray each month, which is a significant contribution to the control of tsetse flies and, hence, of sleeping sickness, while the cost is being met by the affected community.

Each of the young veterinarians was guided by HHS to stock products that would benefit all sectors of animal health and provide extension services in collaboration with the local spray persons. This was expected to enhance the visibility of the whole business network and service utilization, which would translate into increased productivity of animals that would enable the cattle owners to pay for the spray services.

Results

A network of 90 spray persons, who also serve as points where veterinary inputs can be accessed or ordered, has been created in the SOS area. The distribution in numbers per district is given in Table 1.

Table 1. Location of veterinary drug shops by young veterinarians

District	Name of location	Number of spray persons serviced
Lira	Aloi Corner	15
Dokolo and Kaberamaido	Dokolo Trading Centre	30
Apac	Nyambweso Trading Centre	20
	Kidlan Trading Centre	15
Amolatar	Alemere Trading Centre	10
Total		**90**

People in these remote rural areas are able to place their input needs to these spray persons and, in turn, interact on a regular basis with the young veterinarians who are able to supply the requirements on a bi-weekly basis, often conveniently in connection with the popular market days regularly held in the sub-county. On such occasions, the veterinarians provide pre-emptive training and technical information to a wider audience, while also marketing the products used for sleeping sickness control as shown in Figure 2.

Items not available are in turn referred to HHS, which can then supply these from its stores in Jinja or Kampala—cities that are located approximately 370 km and 450 Km from the target areas, respectively. In total, HHS has been able to attract a monthly business turnover of US$5,000 from this arrangement, with 5% ($US250) being the net profit.

As seen in Figure 3, there was a continuous increase of sales of the chemicals used for spraying cattle to target control of sleeping sickness for the months May-August 2008. The foot-and-mouth disease outbreak that started in May 2008 forced the village cattle owners to change their attention and to prioritize using the little money available to treat the wounds on the mouths and feet of the animals as they waited for the vaccination that only took place six months later. The area was also put under quarantine and the economic plight of the farmers additionally worsened by drought due to the delayed rains.

Figure 2. Young Veterinarian explaining one of the products to the community at one of the spray chemicals access points.

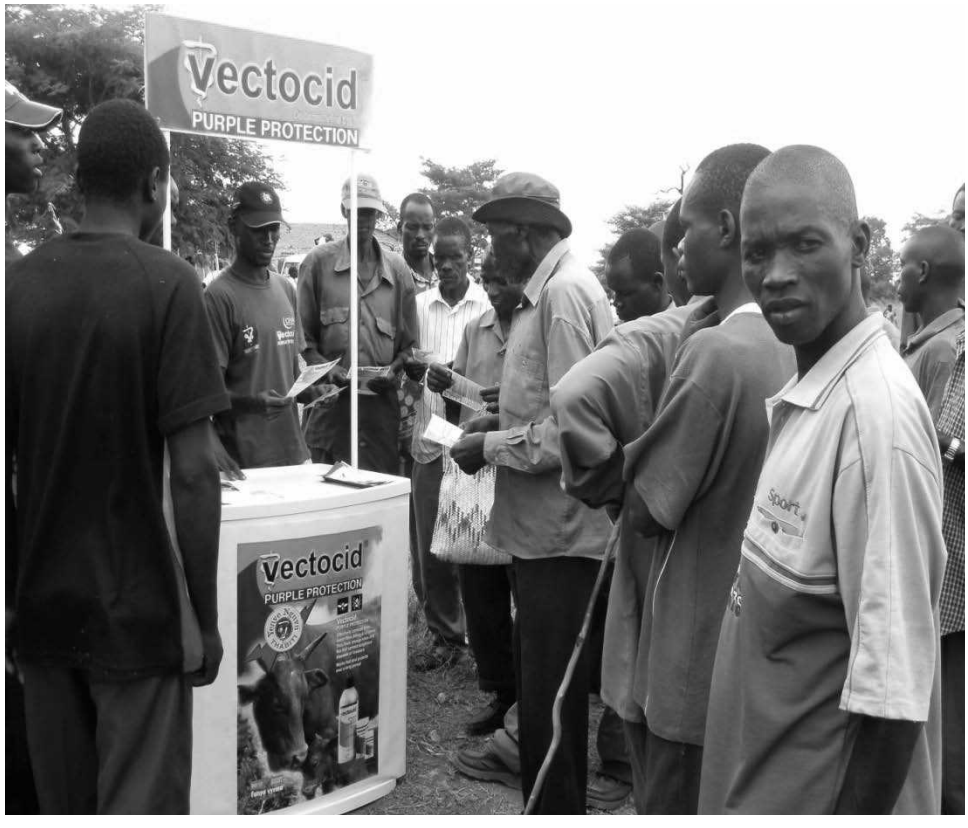
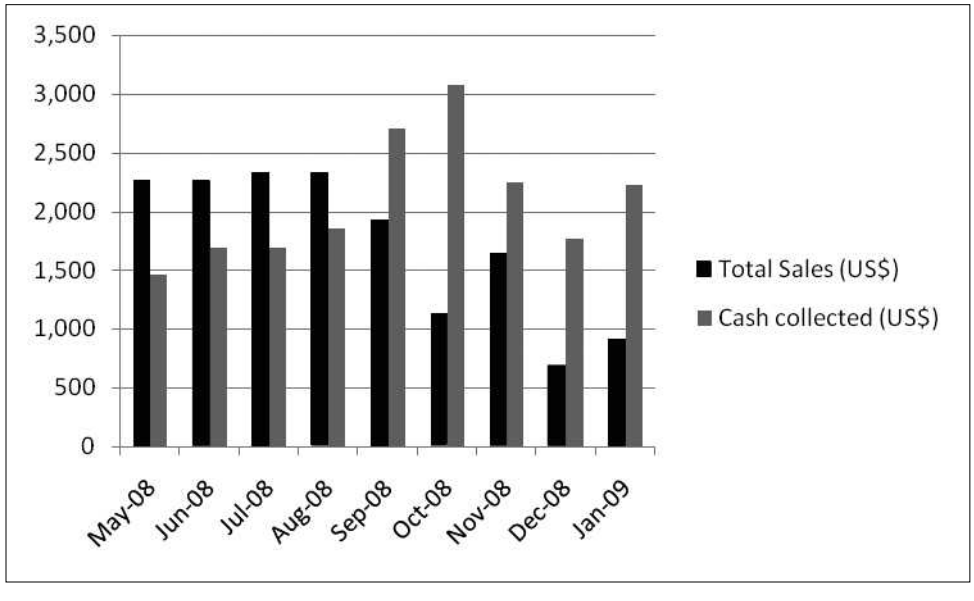


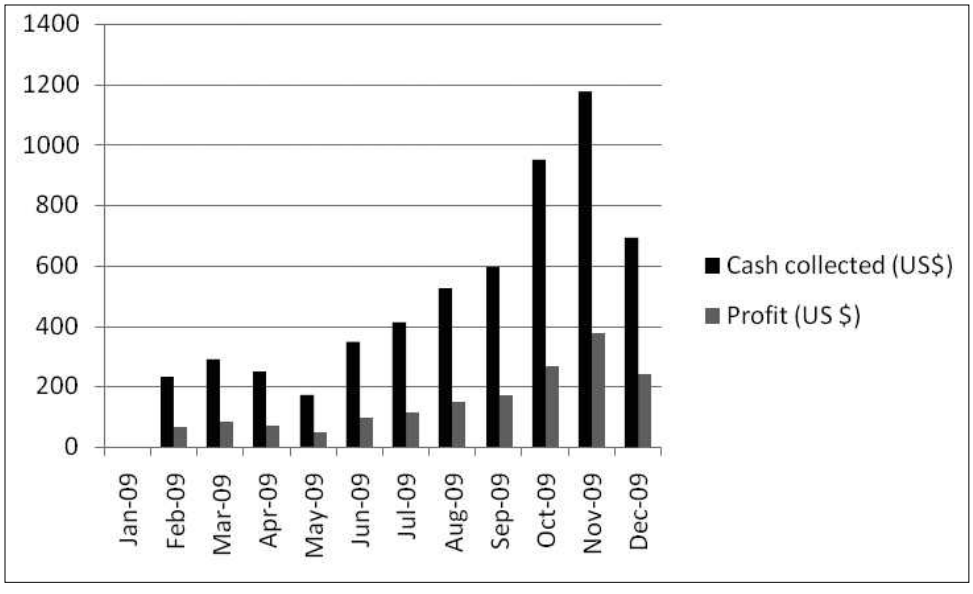
Figure 3. Average sales of deltamethrin (acaricide/insetcide) during the period May 2008 - January 2009.



The situation only came back to normal during November. The December data only represents a little over half a month's sales, as the veterinarians took the Christmas holiday on December 20th and did not work for the remainder of the month. Otherwise, the cash collections and profits (Figure 4) showed an encouraging trend of increasing over the whole year.

These collections and profits do not include the professional fees earned by the veterinarians, which are estimated to equal or surpass the profits on the drug sales per month.

Figure 4: Cash collections and profits from sale of veterinary inputs at one of the drug shops in Apac district.



Selected feedback statements to-date

The initial fears were related to assumptions that people were too poor to afford payment for the treatments. The recovery of the money for the treatments and the feedback from the community are encouraging and show that people will increasingly themselves own the activities related to the control of sleeping sickness.

> *"The veterinary drug and practice business have supplemented our efforts and has helped us educate people that they can help improve the health of their animals while reducing the risk of getting sleeping sickness."* (Dr. Peter Chelli DVO Kaberamaido district)

For the first time, the fresh veterinary graduates appreciated that apart from the not-yet-fully-controlled insecurity threat, there are business opportunities in rural Northern Uganda.

> *"I chose to demonstrate my usefulness by giving a free treatment to a sick cow and its calf with symptoms of trypanosomiasis. After one week, the old lady who was the owner of the animals came looking for me carrying a big cock for*

me to take to the market and get money, as her animals were looking good and their milk production had doubled from one liter to 2 liters within a week after treatment." (Dr. Ronald Were, one of the young veterinarians running the business in Nyambweso trading centre, Apac district)

Some of the pump spray business village participants grasped the approach very early and have taken and utilized the opportunity to their advantage in several ways:

"When I started working with the veterinarian to spray the animals, I made sure I deposited his money on the account and found that I remained with a good amount of money after recovering the debts. I told him to teach me other treatments like deworming and now I want to buy an old motorbike to help me reach other areas, as I can't manage to reach all my clients on a bicycle." (Mr. Ojuka Sam, pump spray businessperson, Chegere, Apac district)

Sam has now become fully engaged in providing animal health services under the guidance of the young veterinarians and has bought a used motorbike for $US600. His monthly turnover has improved from US$100, which was the target for the model when he joined in February 2009, to US$350 in December and is expected to improve since he got the motorbike in December 2009.

Key challenges of strengthening the small business model in sustainability of sleeping sickness control

The major challenge was to introduce the concept of paying for the services in a community that was looked at by everyone as poor and being given some free services by non-governmental organisations (NGOs) in Northern Uganda. Moreover, the first intervention had been funded by CEVA/IK and the livestock owners were not charged for the spray and treatment of the animals. The community leaders also believed that the government was sending free drugs and the young veterinarians were deciding to sell instead of giving it for free. This challenge was overcome through broadening the services that the young veterinarians were giving which clearly went beyond control of tsetse and trypanosomiasis. Furthermore, the benefits of the chemicals used on the reduction of other vectors, such as ticks on the animals, made the cattle owners easily pay for the services. In addition, the veterinarians were facilitated by CEVA/IK and DFID with fuel for six months to continue with awareness messages regarding sleeping sickness and the benefits of using deltamethrin on the animal for its control.

Similarly, since the spray persons could not have money to invest in the pumps and chemicals needed to spray the animals, the young veterinarians offered to give them the initial stock and pump, which they were supposed to pay for after spraying the animals and recovering the money. A few spray persons believed these were free items and took a long time to pay for the initial stock or never paid at all. HHS advised the young veterinarians to concentrate on the spray persons who were paying back well and once it was established that the chemical were not free, those few who had not been paying also started to pay for what they took. In addition, the veterinarians have to ensure that they visit the spray persons at least twice a month to receive the money they have collected, as it may easily be spent on other pressing issues in the family. This inevitably increases the operational costs for the veterinarian. Furthermore, they have been advised to ensure that the visits made are more beneficial to their businesses; otherwise, they drop the spray person and establish a partnership with a new person in the area. Luckily, after having been in operation in their

respective areas for a year, they know the strengths and weaknesses of the different people they work with in the different villages and are able to recruit good replacement spray persons.

Discussion

Sleeping sickness belongs to a group of neglected zoonotic diseases that mainly affect people living in poor rural communities that are devoid of animal and human health services. Control of these diseases has been—and is still—considered as a public good, where various governments support the control strategies with their own resources or with donor resources. Millions of dollars have been spent on the control of sleeping sickness in Uganda for many decades using methods like aerial spraying of insecticides and other methods to eliminate the tsetse. The majority of the sleeping sickness control measures that have been put in place since the beginning of the 20th century have not been sustainable and the disease continues to be a problem in the 21st century. All the major interventions designed could not easily and affordably be adopted by the communities affected by sleeping sickness, and this has resulted in the persistence of sleeping sickness in Uganda.

The model reported here attracted 90 spray persons who are serving as service points where veterinary inputs can be accessed or ordered. This has considerably reduced the stress of having to travel several kilometres to purchase an item that is cheaper than the cost of transport. In addition, a system has been established where animal owners living in rural areas are able to access quality veterinary services through the five young veterinarians. To date, the work and achievements of the young veterinarians and HHS has attracted the attention of development partners like the DFID-UK, who have sent experts to document some learning experiences.

There is a documented increase in sales of the chemicals used for spraying cattle to target control of sleeping sickness. Even more encouraging is that even when farmers were faced with quarantine due to the FMD and drought, the businesses were not much affected, as the young veterinarians still had a role to play in the treatment of the affected animals. Since they were always close to the affected farmers, they advised them to try to continue spraying the animals to avoid additional losses due to the vector-borne diseases, a factor that made the cattle owners associate with the young veterinarians even more, as many found them more user-friendly since they were always available when needed. The small businesses continued to be profitable and are expected to even do better in future, helping to prove that people, once given the knowledge and access to means, can themselves contribute towards solving a problem of public health concern.

Statements extracted as feedback have contributed to the alleviation of initial fears that people were too poor to afford payment for the treatments. It is clear that animal owners are willing to pay as long as they can link the benefit achieved to the actual intervention. Therefore, followers of this model should always be ready to give additional time for providing all the information and technical detail needed or required by the cattle owner whenever there is an opportunity. Quick benefits like increase in milk production that are easily observed by the animal owners are a very important tool in demonstrating the usefulness of the interventions. This easily unblocks any constraints related to payment for the services, drugs and chemicals. Many spray persons turned to spraying and attending to animals as a full-time job as soon as they realised that they were able to make some profits or even earn a living from these services.

Sustainability of the sleeping sickness control activities in Northern Uganda is a major issue, especially in relation to creating a system that can ensure that the supply chain of the

necessary chemicals to a community located more than 450 km from the major distributors is efficient. According to observations, the rural areas of Northern Uganda have not been attractive for business companies to create supply chains in the agrochemical sector (Dr. Okwir Wilson, District Veterinary Officer Lira). As suggested by Hendrix et al. (2005), all future healthcare professionals should be trained in innovative inter-professional problem solving, the "art of thinking outside the box," and the importance of being responsive to the needs of the community. The collaborative efforts of these health professional graduates are vital for the continuous improvement of any nation's healthcare system in the 21st century. Therefore, input for models targeting the training of service providers to affected communities in very remote areas through the public sector with a view of also developing future avenues for sustainability can be obtained from ideas given by other relevant professional collaborations. Sustainability of the control activities is a major issue, especially the creation of a system that can ensure that the supply chain for the sourcing and distribution of the necessary products to a community situated more than 450 km from the major distributors is efficient.

As evidenced from the results, small businesses that are attractive to young professionals can serve several purposes. These include, but are not limited to, reducing the number of unemployed young professionals in developing countries, improving the provision of extension of services to the communities in remote areas, sustaining innovative technologies that can be used in disease control and any public good, and improving the number of people participating in the sustainability of solving problems of public health concern.

It is to be remembered that by 2005, *T.b. rhodesiense* sleeping sickness was rapidly spreading to areas in Uganda that previously had not been known to be affected with sleeping sickness, and caused worry of a merger with the *T.b. gambiense* sleeping-sickness-affected areas (Picozzi et al., 2005). The disease spread at a time when the veterinary and public health services were greatly inadequate in the Northern Uganda areas, which were just recovering from armed rebellion. Furthermore, as noted by Vian et al. (2007), the ability of health organizations in developing countries to expand access to quality services depends in large part on organizational and human capacity—including professional development of staff—as well as efforts to create working environments conducive to high levels of performance.

Conclusion

Intensive awareness campaigns helped overcome the initial challenges of trying a business model in a community that was used to receiving free services from NGOs and believed that chemicals and drugs for public good were to be supplied free of charge. In addition, the engagement of young professional and village sprayers in helping control the disease that was threatening the lives of people of Northern Uganda proved to be a viable alternative that should be explored by other community service providers. Most encouraging is that the system built helped prevent the merger of the two diseases and has helped create a model that helps participants at all levels (young veterinarians, village spray personnel and animal owners) benefit from the approach and allows people who had been earlier perceived as poor able to contribute immensely to the sustainability of the control of sleeping sickness.

Recommendation

Entrepreneurship approaches should be adopted in the control of diseases affecting the rural poor since it allows participation of all stakeholders with a cumulative small benefit at all levels as the incentive for participation. For the zoonotic type of sleeping sickness, the

model described in this paper should be used in other *T.b.rhodesiense* sleeping-sickness-affected areas of Africa. Furthermore, in all approaches, public good investment in the awareness of the problem being solved and the associated benefits, such as the control of other vector-borne diseases, should always be part of the messages used in engaging the affected communities.

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