

Recent outbreaks of Foot and Mouth Disease in Botswana and Zimbabwe

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Abstract

Preventing the spread of FMD is based on various interventions that attempt to minimize the contact between infected and not infected animals and restrict the movement of possible virus carriers. Such measures have proven to be highly effective when adhered to. The recent outbreaks of FMD in Botswana and Zimbabwe are examples of the need for a swift and integrated approach when such an outbreak occurs. This approach is based on clinical inspection of animals (game and domestic) at risk to identify infected animals, the identification of the index case(s), strict movement controls, vaccination and slaughter. Such interventions can prevent the spread of the disease but are logistically, financially and sometimes politically very demanding. Failure to implement such control measures may result in the rapid spread of the disease and considerable economic loss.

Keywords: Livestock, Game, Foot and Mouth Disease, Southern Africa, Disease control, Integrated approach

Résumé

La prévention de la diffusion de la fièvre aphteuse (FMD) est basée sur diverses interventions qui tentent de minimiser le contact entre animaux infectés et non infectés et de limiter les mouvements des porteurs de virus potentiels. De telles mesures ont prouvé être hautement efficaces quand elles sont appliquées. Les épizooties récentes de FMD au Botswana et au Zimbabwe sont des exemples de la nécessité d'une approche rapide et intégrée lors de telles apparitions de la maladie. Cette approche est basée sur l'inspection clinique des animaux à risque (sauvages ou domestiques) dans le but d'identifier les animaux infectés; sur l'identification de premiers cas; sur le contrôle strict des déplacements; sur la vaccination et sur l'abattage. De telles interventions peuvent empêcher la diffusion de la maladie, mais sont logistiquement, financièrement et, parfois, politiquement très exigeantes. L'échec de la mise en oeuvre de telles mesures de contrôle peut aboutir à une diffusion rapide de la maladie et à des pertes économiques considérables.

Mots-clés : Bétail, Gibier, Fièvre aphteuse, Afrique australe, Contrôle des maladies, Approche Intégrée

Resumo

A prevenção da disseminação da febre aftosa (FMD) baseia-se em várias intervenções as quais tentam minimizar o contato entre animais infectados e não infectados e restringir o movimento de possíveis portadores do vírus. Tais medidas provam ser altamente eficazes quando adotadas. Os recentes surtos de FMD em Botswana e no Zimbábue são exemplos da necessidade de uma abordagem rápida e integrada quando tais surtos ocorrem. Esta abordagem é baseada na inspeção clínica dos animais (selvagens e domésticos) para possível identificação de animais infectados, identificação de caso(s) índice, rigoroso controle de movimentos, vacinação e abate. Tais intervenções podem prevenir a disseminação da doença, mas são logisticamente, financeiramente e às vezes politicamente muito exigentes. Falhas na implementação destas medidas de controle podem resultar em rápida disseminação da doença e em uma considerável perda econômica.

Palavras-chave: Gado, Selvagem, Febre aftosa, Sul da África, Controle de doença, Abordagem integrada.

Introduction

Botswana and Zimbabwe are two southern African countries that rely heavily on agricultural exports of animal origin. The uncontrolled presence of Foot and Mouth Disease (FMD) in any of these countries has disastrous repercussions.

In Botswana, the first official records of FMD date back to the period between 1850 and 1900

(Thomson, 1994). Between 1933 and 1980, Botswana experienced FMD outbreaks at two years intervals. Notable exceptions were the periods between 1950 to 1957 and 1968 to 1977 where there was a lapse of 6 and 8 years respectively between outbreaks. The last reported outbreak of FMD in Botswana, before 2002, was in September 1980.

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Zimbabwe also has a long history of FMD outbreaks and up to 2001 managed to control the disease effectively. For example, the June/July 1999 FMD outbreaks which occurred on two ranches in the buffer zone of Chiredzi District (Masvingo Province) were controlled successfully. Recent changes in the political and economic scene, however, have had important repercussions on the functioning of veterinary services and the control of FMD. This is clearly demonstrated by the FMD outbreaks occurring between 2001 and 2003.

Recent FMD outbreaks and their control

The Matebeleland North Province outbreak in 2001 (Zimbabwe)

On 18 August 2001, FMD was reported in cattle at Dunstall Feedlot in Bulawayo, Matebeleland North Province. Immediately after reporting, large portions of the Province were put under quarantine while control measures, which included vaccinations and restrictions on animal movements, were instituted. Detailed investigations indicated that about 300 steers, intended for slaughter and purchased from the buffer zone in Matebeleland North by Cold Storage Company (CSC) a week before the 18th of August, were taken to Dunstall feedlot. Some of the animals

were transported to three other properties (Maphaneni Ranch and other properties south of Gwanda) of the CSC in Matebeleland south Province. Trace-backs from Dunstall feedlot revealed that the infected steers came from an infected area in Lupane (Figure 1).

The SAT2 serotype was involved. The oldest lesions seen were estimated to have been between five and seven days old on 18th August, and about 40% of the Steers exhibited lesions. Urgent tracings of all movements from Dunstall feedlot were conducted and all properties involved were subjected to veterinary inspections. All properties that had received animals from Dunstall were found infected, and became source of infection themselves. By October 2001, 1536 cases had been confirmed and 7634 cattle vaccinated. From November 2001 up to March 2002 no new cases were reported.

The Matsiloje extension area (Francistown District) outbreak in 2002 (Botswana)

After the Zimbabwean Department of Veterinary Services announced the outbreak of FMD in Matebeleland North Province in August 2001, Botswana instituted FMD surveillance in the Francistown and Selibe-Phikwe veterinary districts bordering Zimbabwe. Furthermore, a countrywide passive surveillance involving visual

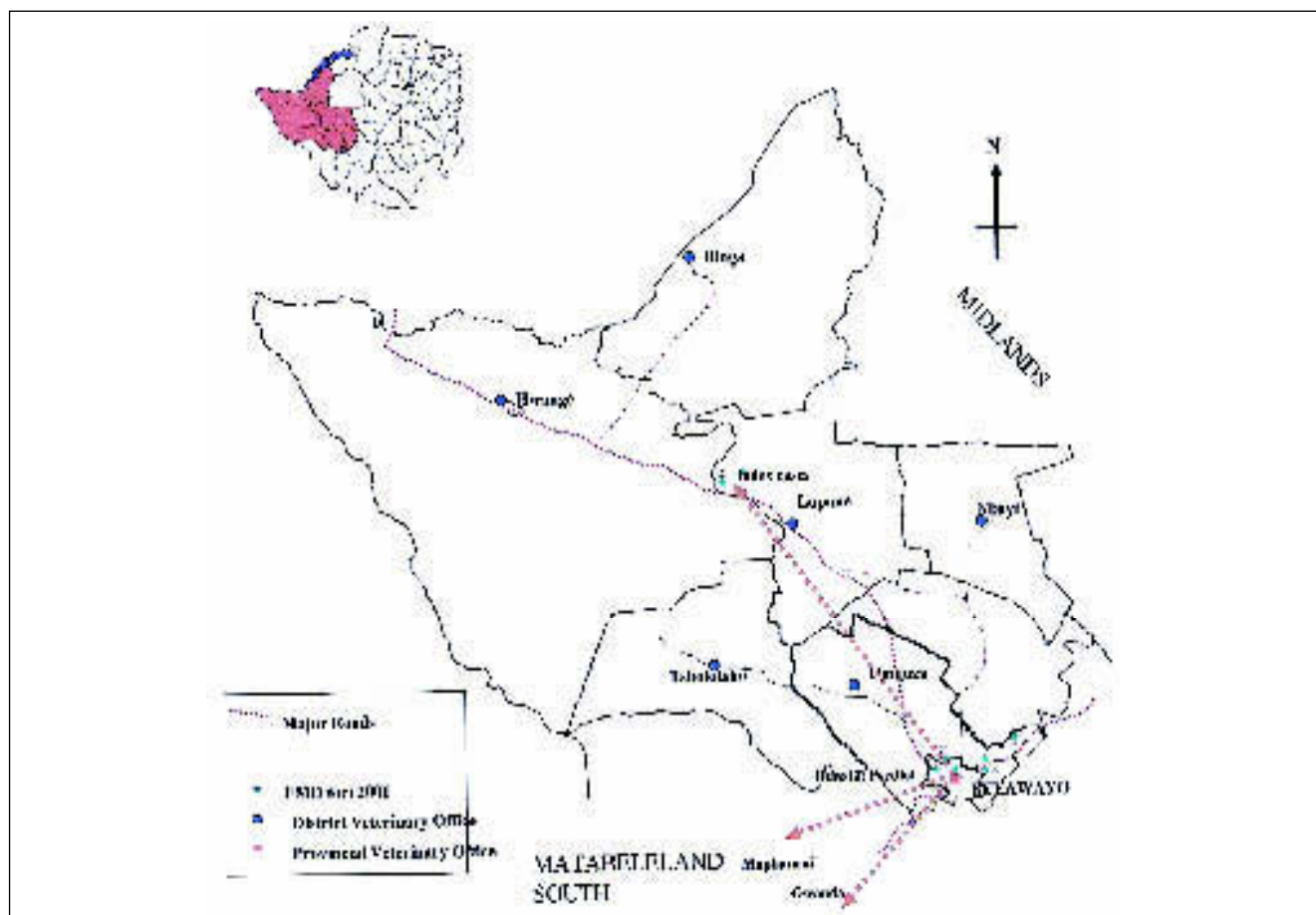


Figure 1: Trace-back from Dunstall feedlot to index case in Lupane and further spread to Matebeleland South Province.

inspection of all cloven hoofed livestock was initiated and the public was sensitized through all media available. On 7 February 2002, a surveillance team reported cattle showing signs suggestive of FMD at Lephaneeng crush in the Matsiloje extension area (Figure 2).

from the Botswana Defense Force, Botswana Police Services and the Special Support Group (SSG). On 27 February 2002, a second FMD case was detected at Rakop1 crushpen within the infected zone (Figure 2). All animals from the infected crushpens were impounded

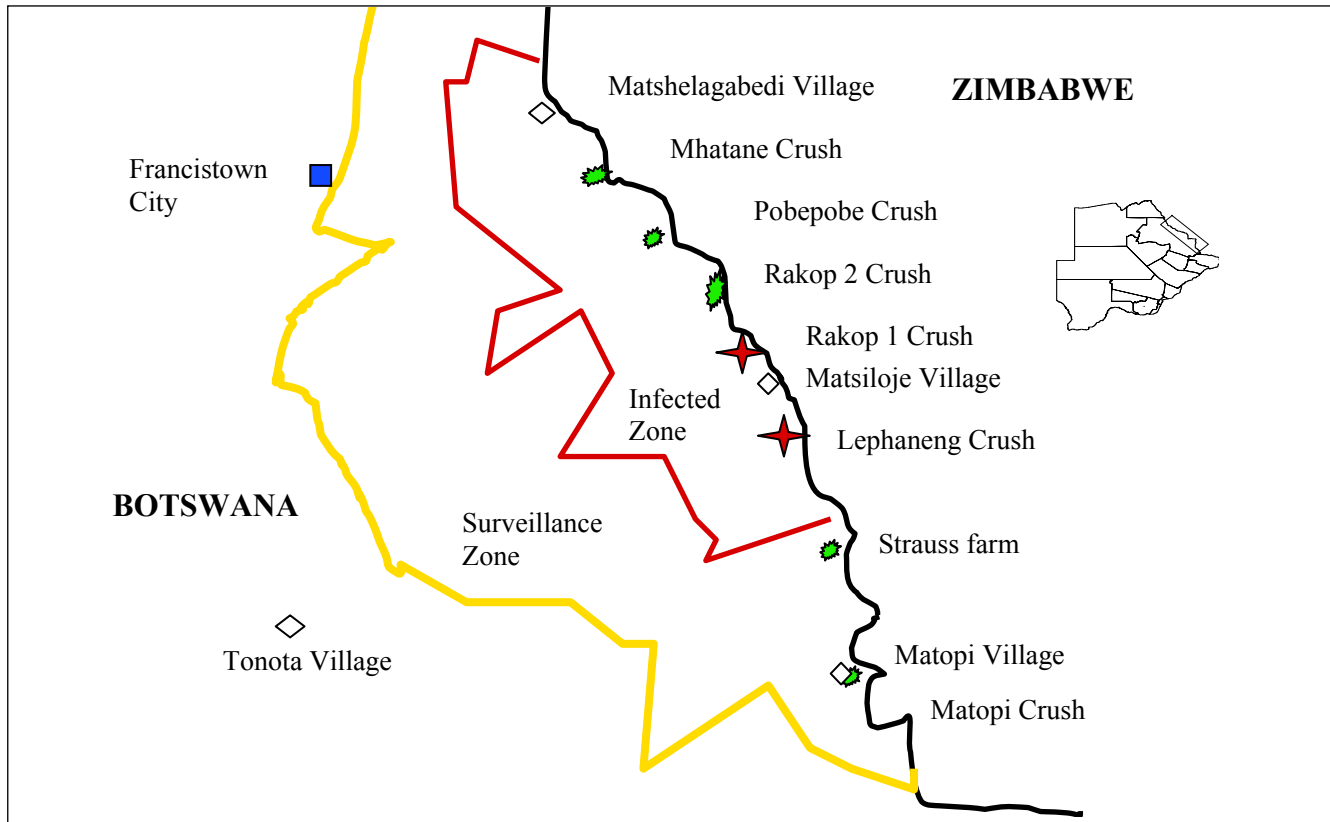


Figure 2: The delineated control zones during the 2002 FMD outbreak. Only the infected crushes and those alongside the border have been shown.

The district veterinary officer supported the diagnosis and a veterinary team from headquarters in Gaborone arrived the same day. A total of 66 out of 8000 cattle clinically inspected were found to have lesions characteristic of FMD. The estimated date of first infection was estimated to be 31 January 2002.

Foot and Mouth Disease (serotype SAT 2) was officially diagnosed on 9 February and later confirmed by the Institute for Animal Health, Pirbright. The virus isolated from the Matsiloje outbreak area was genetically closely related to the Zimbabwe isolates collected near Bulawayo in August 2001 (Knowles & Davies, 2002).

Immediately after confirmation of the outbreak, the whole of Matsiloje extension area was considered infected zone and delineated based on the existing physical barriers in the area. The adjacent surveillance zone extended up to 20 km from the perimeter of the infected zone. Pickets were established at 5 kilometers intervals around the perimeters of both zones. Roadblocks for disinfection were set up at all access points as well as on all major roads leading into zones 6 and 7. Extensive use was made of logistical support

whereas in other crushpens with absence of clinical infection, vaccinations were carried out with the trivalent vaccine. Cattle in the infected zone were vaccinated and branded "I" for identification purposes. The total goat and sheep population (6,594 goats and 761 sheep) of the infected zone were clinically inspected and serologically tested but results were negative. Furthermore, 56 Impala (*Acepyceros melampus*) and 5 Greater Kudu (*Tragelaphus strepsiceros*) also yielded negative FMD results on clinical and serological tests. In the immediate surveillance zone, clinical inspections of approximately 30,000 cattle were carried out five times at intervals of two weeks with negative results. In the outer surveillance zone, 330 000 cattle were clinically inspected and a total of 34 200 sera collected. Clinical and serological results were negative. Subsequently, the Cabinet approved the strategy recommended by the Department of Animal Health and Production to destroy the cattle population in the infected zone. By 21 May, all 12,197 cattle in the infected zone had been killed and disposed of by deep burial. All 131 pigs in the infected zone were also destroyed and buried even though no lesions were observed on clinical inspections.

The Masvingo Province outbreak in 2002-2003 (Zimbabwe)

In August 2002, new FMD outbreaks were reported in a communal area of Masvingo Province of Zimbabwe. The infected area was located close to a conservancy where buffalo were reported to have mixed with cattle (Figure 3) since sections of the fence of the conservancy were destroyed. Furthermore, people had settled in the conservancy and cattle were observed grazing inside the conservancy. Poaching was common and routine patrolling and maintenance of the fence was not conducted. Concurrently, livestock movements had intensified as a result of the land reform program and were difficult to control. This and other factors such as shortage of vaccines and limited resources contributed to the quick spread of the disease in the province and subsequently to other provinces (Figure 3).

The serotype involved in all the outbreaks was the SAT 2. Animal movement restrictions were intensified in affected areas by setting up road blocks on major roads. Control measures used were based on vaccinations of cattle in the 10 km radius and quarantine in the 20-40 km radius. As the disease spread, mass vaccinations in affected Districts (about 140 000 were vaccinated in Masvingo Province) were

conducted. Individual identification of vaccinated animals was done by branding with an inverted “V” brand and those with clinical signs with an “S” brand. No animals were slaughtered.

The Matopi crushpen (Francistown District) outbreak in 2003 (Botswana)

Matopicroshpen is located approximately 15 kilometers south of Lephaneng crushpen where 66 cases of FMD were diagnosed during the Matsiloje outbreak (see above). On 6 January 2003, a farmer at Matopi crushpen reported extensive lameness amongst his cattle. The day after, FMD was diagnosed based on observed clinical signs in 9 out of 900 cattle at the same crushpen. The estimated date of first infection was 23 December 2002. The diagnosis was confirmed by the BVI and the Institute for Animal Health, Pirbright.

Upon diagnosis of the disease, the infected and surveillance zones were determined and delineated following existing physical barriers. Biosecurity measures similar to the ones implemented in 2002 were adopted. Clinical inspection in a targeted 25 km x 30 km zone revealed 14 more cases in Matopi crush. Two cases were identified in Tsiteng crush 8 km south of Matopi crush and on 24 January a case was

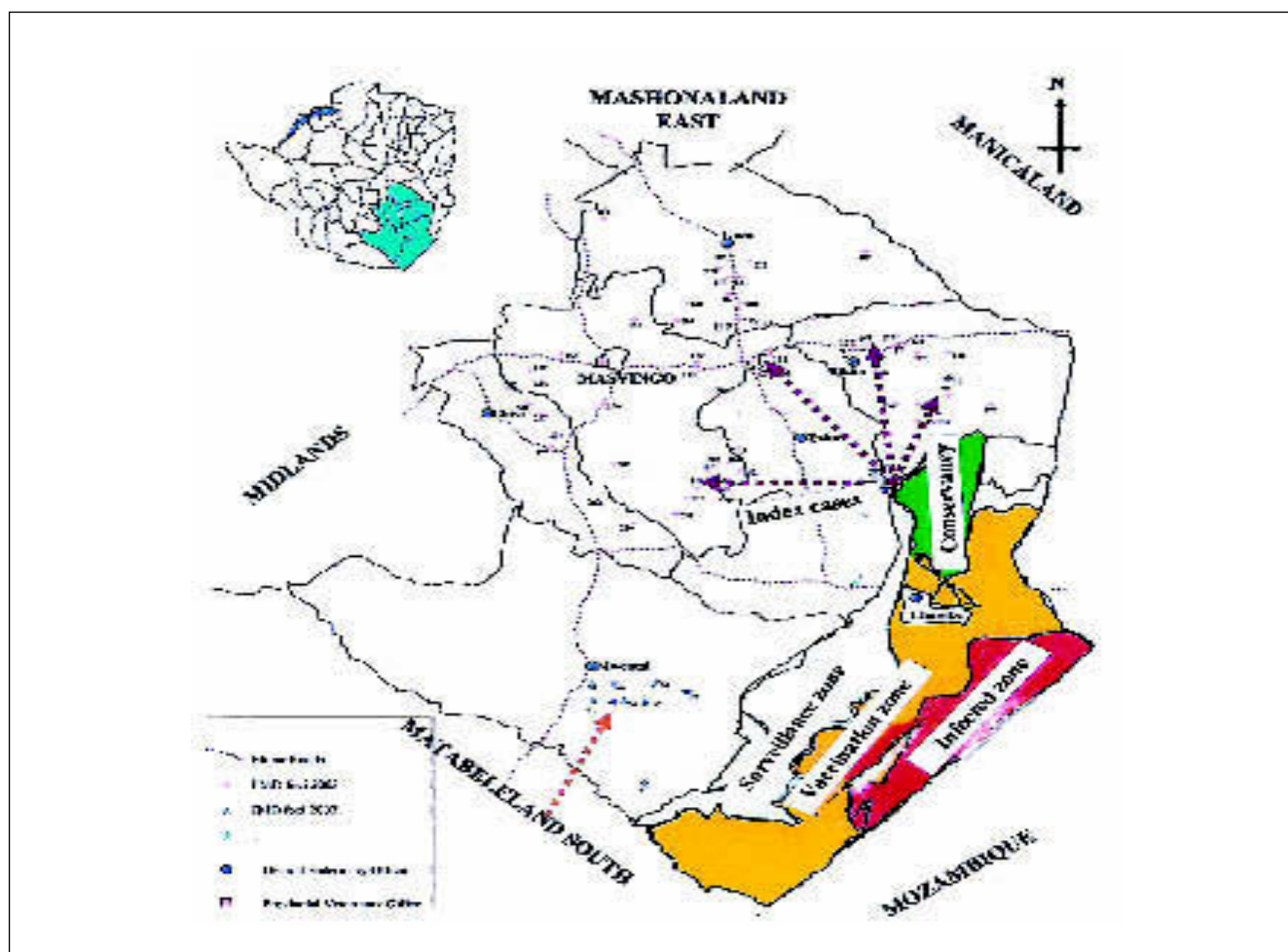


Figure 3: Spread of FMD from index cases near a conservancy in Masvingo Province.

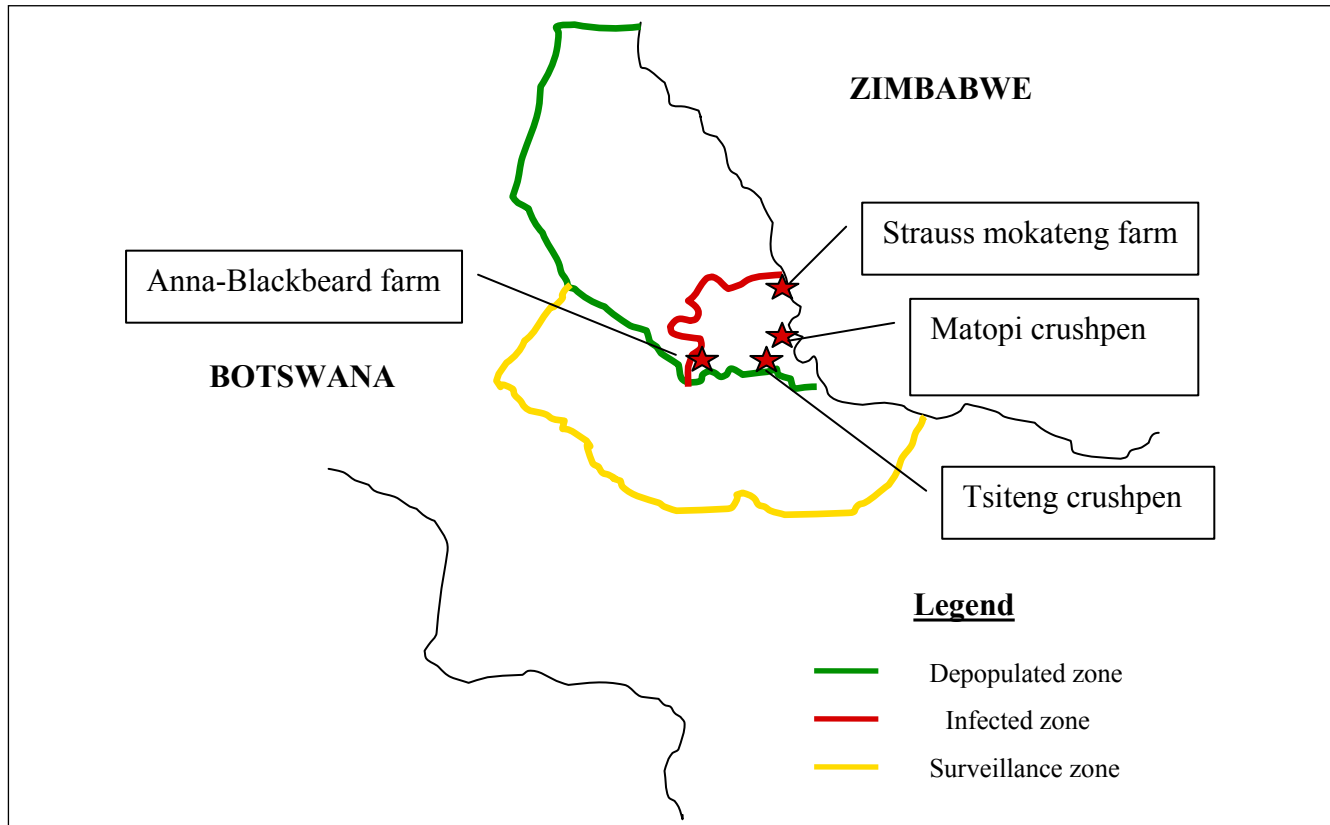


Figure 4: The delineated control zones during the 2003 FMD outbreak. Only infected crushes are shown.

recorded at Anna Blackbeard farm approximately 10 km south of Tsiteng. This brought the total number of bovine cases in the delineated infected zone to 26 in an estimated cattle population of 5000. Still within the infected zone, a surveillance team spotted and shot a lame emaciated wild Kudu. Samples obtained from the cattle and Kudu cases were confirmed positive for FMD serotype SAT 1. Subsequently, a total of 389 goats and 32 sheep (representing the total population in the area) were clinically inspected and sampled. Both clinical and serological results were negative for FMD. A sample of 123 cloven-hoofed wildlife species (97 Impala and 26 Kudu), also from within the infected zone, were clinically and serologically tested and also found to be free of FMD. The spread of the disease was finally halted by destruction of all the 3 864 cattle and 58 pigs in the infected zone.

Discussion

Foot and Mouth Disease is a highly contagious transboundary disease that can spread rapidly within the livestock population. Experiences in southern Africa, especially in Botswana and Zimbabwe, have proven that through a combination preventive and curative measures outbreaks can be controlled

effectively. Together, those measures constitute an early warning system and delay the spread of infected animals into a susceptible population when an outbreak occurs. The experiences of the recent outbreaks in Botswana and Zimbabwe clearly show that for an effective control all components contributing to this effectiveness need to be present. This requires important financial, logistical and sometimes political commitments. Failure to allocate sufficient resources may result in a fast and devastating spread of the disease.

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