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Northern Research Extension and Epidemiosurveillance Support Project

Assessment and sustainability of the Northern Namibia Animal Diseases Information System

Mission report, 21st – 30th June 2004

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Résumé:

Avec l'appui de la Coopération française, les services vétérinaires namibiens ont mis en place dans le nord de la Namibie un réseau d'épidémiosurveillance des maladies animales : le NNADIS (*Northern Namibian Animal Diseases Information System*). Il s'agissait de réaliser une surveillance épidémiologique de la même qualité que celle intervenant dans le sud du pays, alors que les conditions d'élevage du nord sont très différentes : petits producteurs non organisés, frontières avec des pays aux infrastructures vétérinaires déficientes et divagation de faune sauvage induisant un fort risque d'occurrence de la fièvre aphteuse. L'objectif de cette mission était d'évaluer le réseau d'épidémiosurveillance mis en place et de faire des propositions pour permettre aux services vétérinaires namibiens d'améliorer la situation, le cas échéant.

Le NNADIS est un réseau d'épidémiosurveillance d'excellente qualité, ayant peu d'équivalent sur le continent africain. Il s'appuie sur une infrastructure vétérinaire solide, ayant traversé avec succès les difficultés liées à l'accession de la Namibie à l'indépendance.

Les principales suggestions pour améliorer son fonctionnement sont :

- le recours plus fréquent au laboratoire pour confirmer les suspicions cliniques,
- la réalisation d'enquêtes transversales pour faire le bilan épidémiologique des infections fréquentes mais relevant plutôt d'une gestion par les éleveurs que de l'administration (parasitisme, pathologie respiratoire des petits ruminants,...),
- la focalisation de la surveillance *stricto sensu* sur les maladies présentant une contrainte aux échanges ou un risque grave pour la santé publique (PPCB, fièvre aphteuse, charbon bactéridien, rage,...),
- le renforcement des capacités des services déconcentrés en épidémiologie et informatique, pour une meilleure réalisation des enquêtes et une meilleure exploitation des résultats.

List of acronyms

AHT	Animal health technician
BF	Butcher form
CAHW	Community animal health workers
CAHI	Chief animal health inspector
CBPP	Contagious bovine pleuropneumonia
CIRAD	Centre International de Recherche Agronomique pour le Développement
CVF	Community visit form
CVL	Central Veterinary Laboratory
DRF	Disease report form
DVS	Directorate of Veterinary Services
EIS	Epidemiological information system
EU	European Union
FMD	Foot and mouth disease
LSD	Lumpy skin disease
NASSP	National Agriculture Support Services Programme (EU project)
NCA	North central areas
NCD	North Central District
NNADIS	Northern Namibian Animal Diseases Information System
NOLIDEP	Northern Livestock Development Project
NOREESP	Northern Research in Extension and Epidemiology Support Project
SCAC	Service de Coopération et d'Action Culturelle (Ambassade de France)
SF	Suspicion form
SV	State veterinarian
VCF	Veterinary cordon fence

Contents

1. Introduction

Northern Research in Extension and Epidemiology Support Project (NOREESP) is a 5-year old programme of the Namibian Directorate of Veterinary Services funded by the French Cooperation. One of its components was the implementation of an epidemiological information system (EIS) in the northern, communal area of Namibia to complement the existing EIS in the commercial system. This EIS was called the Northern Namibian Animal Diseases Information System (NNADIS). The implementation of a specific EIS in this area was motivated by 3 main reasons:

- the Caprivi stripe (Fig. 2) is characterized by a high density of wild fauna, among which buffaloes roaming across the boundaries of neighboring countries. They share the available grasslands with cattle and might transmit them foot-and-mouth disease (FMD). An epidemic of FMD would have huge consequences both for animal health and international meat trade, resulting in economic disasters for Namibia. This motivated the implementation of the veterinary cordon fence (VCF) in the early 1960's, separating northern Namibia from the rest of the country. The eastern Caprivi region was classified as an FMD-infected zone submitted to FMD vaccination, while the remaining of the northern regions were considered as a buffer zone with reinforced FMD-surveillance measures.
- northern Namibia has borders with countries suffering of poor veterinary services and general facilities (Fig. 2). The intense trans-boundary livestock movements observed in the region result in high risk of disease introduction. Several outbreaks of contagious bovine pleuropneumonia (CBPP) were thus observed during the last decades and CBPP was considered as endemic in the North Central District in the mid 1990's. Mass vaccination campaigns were thus decided to get rid of the disease, together with the monitoring of CBPP incidence to assess the success of the vaccination campaigns.

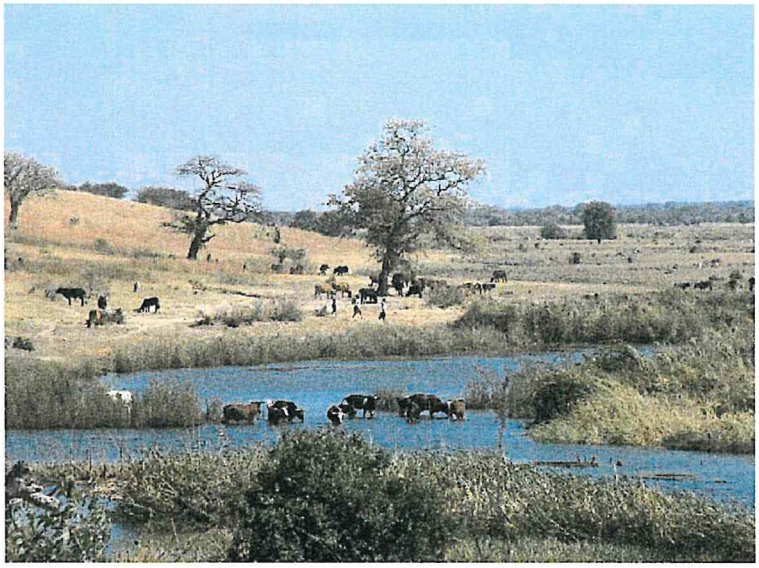


Fig. 1. Watering of cattle at the border between Namibia and Angola, near Rundu

- While the southern areas were effectively protected by the VCF against FMD and PPCB, it exacerbated the economic difficulties of the northern smallholders for which cattle and small stocks were one of the main source of income. The Namibian government thus decided to reinforce disease surveillance and control

measures to improve animal health and allow the resumption of commercial flows from the north of Namibia to other areas and countries.

Therefore, two main goals were assigned to the NNADIS:

(1) Strengthen the surveillance against the diseases of national importance: CBPP and FMD,

(2) Provide a better knowledge of endemic diseases, to help the regional veterinary services and farmers to target more efficient prevention and control measures.

The CIRAD was chosen by the NOREESP to support the implementation of the NNADIS. This report was written after the last mission which was carried out in this frame. It aimed at assessing the quality of the NNADIS and to make proposals to improve it, and ensure its sustainability for the coming years.

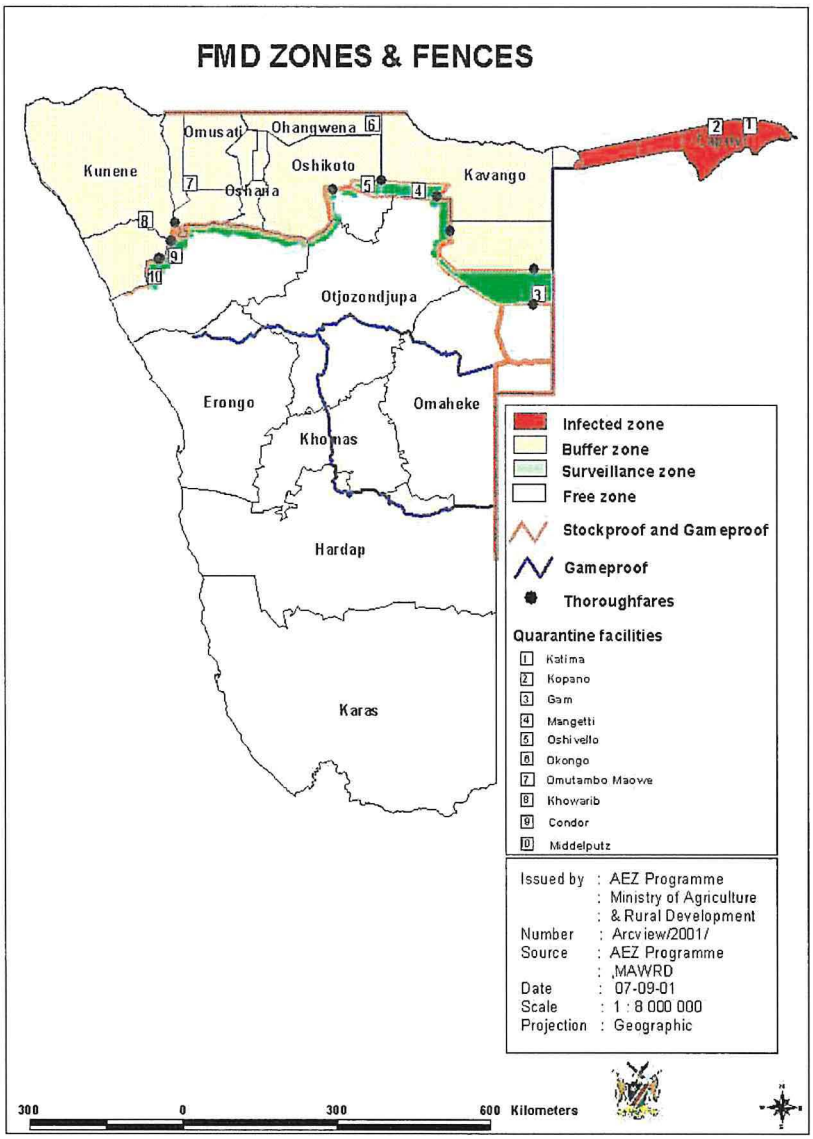


Fig. 2. Regions involved in the NOREESP. *These regions correspond to the infected and buffer zones (source: DVS, 2003).*

2. Description and analysis of the NNADIS

2.1. Epidemiological surveys

2.1.1. Diseases under surveillance

The list of diseases submitted to regulations in Namibia, including surveillance, is shown in Annex 6.5. Beyond this general list, priority diseases were defined by the DVS and the NOREESP, some of them not belonging to the general list (e.g. internal parasitism). The rationale was to meet both national constraints (protection of the national livestock to achieve exportation requirements) and farmers' needs (economic losses caused by the dominant diseases). This list differed in each region of northern Namibia to account for local peculiarities related to agro-ecological features, farming systems, etc. It is shown in Tab. I.

Tab. I. List of the NNADIS priority diseases (from Goutard, 2003)

Kunene	North Central District	Kavango	Caprivi
CBPP	CBPP	CBPP	CBPP
FMD	FMD	FMD	FMD
Rabies	Rabies	Rabies	Rabies
Anthrax	Botulism	Black quarter	Black quarter
Mange	Internal parasites	Newcastle disease	Newcastle disease
Botulism	Mange	Mange	Anthrax
Pulpy kidney	LSD	Botulism	Brucellosis
Pasteurellosis		Internal parasites	LSD
Internal parasites		Kerato-conjunctivitis	Nagana
			Pasteurellosis

2.1.2. Surveys

The general scheme for disease surveillance in Namibia is displayed in Fig. 3.

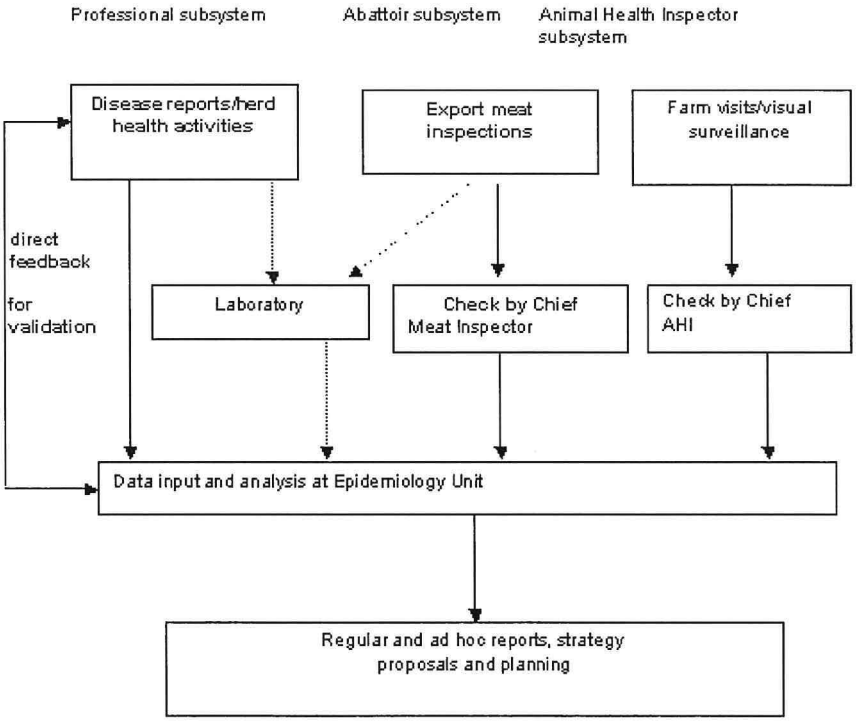


Fig. 3. General design of the Namibian disease information system (from DVS, 2003)

With respect to the NNADIS, the following peculiarities should be noted.

2.1.2.1. Traceability

This issue is of growing importance in the frame of disease surveillance and international trade regulations. For the commercial farms, individual identification with pre-printed plastic ear tags will soon be implemented, together with a national database keeping track of individual data on origin, natural death and offtake.

Such a system will also be implemented in the northern Namibia but practical difficulties will arise from the high number of smallholders and the importance of the informal cattle market, making it difficult to trace the animals. By now, a preliminary identification system is already available. It relies on cattle branding which occurs on three occasions:

- when animals cross the border between neighbouring countries and Namibia (e.g. A for Angola);
- during the vaccination campaign: branding is performed with a hot iron (Fig. 4), mark of which is specific of a particular vaccination campaign (e.g. a descending arrow). The purpose of this brand is to prove that the animal was really vaccinated. Though this is not an individual identification system, it might be useful for possible monitoring surveys to assess the actual CBPP vaccination coverage;

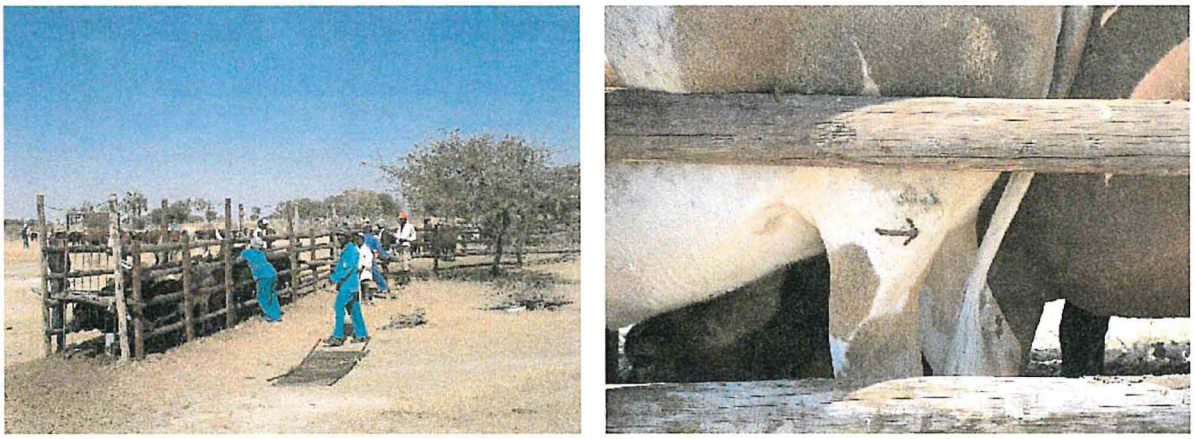


Fig. 4. CBPP vaccination and branding of cattle in Outapi

- for individual identification with a hot iron specific of a farmer (or at least a kraal) and recorded on a register. Presently, this is the only way to trace an animal back to its owner, when a disease is observed on a market or a lesion is observed at the abattoir. State vets and chief meat inspectors think it would be possible in the case when the farmer directly sold his cattle to Meat Co. However, many cattle traders are often involved between the farmer and the slaughterhouse, making it difficult to trace cattle back in case of CBPP lesions found during the post-mortem examination.

It would thus be useful to assess cattle traceability with a formal survey (random sample of cattle drawn at the abattoir and estimation of the traceability frequency), and see how it improves with time and the introduction of a new identification system.

2.1.2.2. Professional subsystem

It is not represented in the NNADIS area.

2.1.2.3. Abattoir subsystem

There are two commercial abattoirs (Oshakati and Katima) in the north of Namibia (Fig. 5). In each of them, 3 to 400 cattle were weekly slaughtered at the time of our visit. Cattle are submitted to a 21-day quarantine before slaughtering and an ante-mortem examination is carried out at the abattoir. Post-mortem findings arising from meat inspection are recorded, with a special mention to lung lesions. Samples are made when necessary and sent to the Central Veterinary Laboratory (CVL), though is was mentioned that until a few months ago, chief meat inspector were asked to be parsimonious in their sending.

Fig. 5. MeatCo abattoir in Katima

Though a stronger recourse to the lab was recently encouraged, the number of lung samples (mostly suspicions of chronic CBPP) sent from the abattoirs to the CVL is still low, because in the past, the results of such samples were always negative. The reason of this persistent negativity is not clear: inappropriate sample, absence of mycoplasmas in sequestra, lack of sensitivity of laboratory tests,... In the perspective of CBPP eradication, it would be important to set up a detailed protocol (samples, conservation, laboratory tests) to have a more accurate monitoring of CBPP prevalence in northern Namibia.

However, given the low number of animals entering this commercial circuit, and the associated selection bias (only animals in good condition are chosen), information produced by meat inspection in commercial abattoirs are certainly not representative of the epidemiological situation in the northern regions.

The meat sold on the village markets is provided by local butchers (Fig. 6). An important component of the NOREESP aimed at training these village butchers and help them to improve meat hygiene in their butchery. They are asked to hold records of all the slaughtered cattle and to fill a butcher form (BF) when lesions of a notifiable disease are encountered (mainly CBPP acute or chronic lung lesions).

Fig. 6. Village butcher's shop in Katima

Animal health technicians (AHT) are responsible for the training and monitoring of the village butchers. Mitigated successes were encountered with respect to this action. Some butchers are very good reactors to the promoted improvements for data reporting and meat hygiene, while others bring little change, if any, to their usual practice. Moreover, a thorough census of the village butchers looks very difficult to achieve, because this activity is often occasional and informal. Thus, a consistent follow-up of each butcher looks like an unrealistic goal. At last, many cattle are still slaughtered at the family level, without any meat inspection. On the whole, little health information arise from this informal meat sector.

The responsibility of meat inspection on village markets depends also on the Ministry of Health. Little action seem to be actually done by Health Inspectors.

2.1.2.4. Animal health inspector subsystem

Duty sheets were written for each stakeholder to enumerate and define all the activities implemented in the disease surveillance protocols. They are presented in annex 6.6.

Stakeholders

The relational scheme of these stakeholders is displayed on Fig. 8. In northern Namibia, most of the veterinary services are provided by the administration. Regional services are under the authority of a state veterinarian (SV), assisted by a chief animal health inspector (CAHI); some of the CAHI are not graduate.

Basic field work is achieved by animal health technicians (AHT). Many of them are not graduate but the national policy is that any new AHT should have an academic training and a diploma. In the frame of disease surveillance, the duty of AHT is to implement community visits and first investigations on outbreaks reported by the communities or individual farmers. On each of these occasions, they fill community visit forms (CVF) and suspicion forms (SF).

AHT are helped by Stock Inspection Assistants (SIA). Their duty is to vaccinate and mark the cattle during the vaccination campaigns, and to inform the AHT or CAHI in case of a priority disease suspicion. Many of them are illiterate and their involvement in disease surveillance is limited.

Because human resources are scarce and local conditions are not attractive enough to allow the installation of private veterinarians, the implementation of

veterinary auxiliaries – community-based animal health workers (CAHW) in the Namibian terminology, is strongly supported and encouraged by the DVS. The role of CAHW is to provide farmers with primary animal-health care (diagnostic of the commonest diseases and delivery of veterinary drugs) and to report serious diseases to the AHT. They are members of the communities and are selected on the basis of an agreement between the communities and the regional veterinary services.

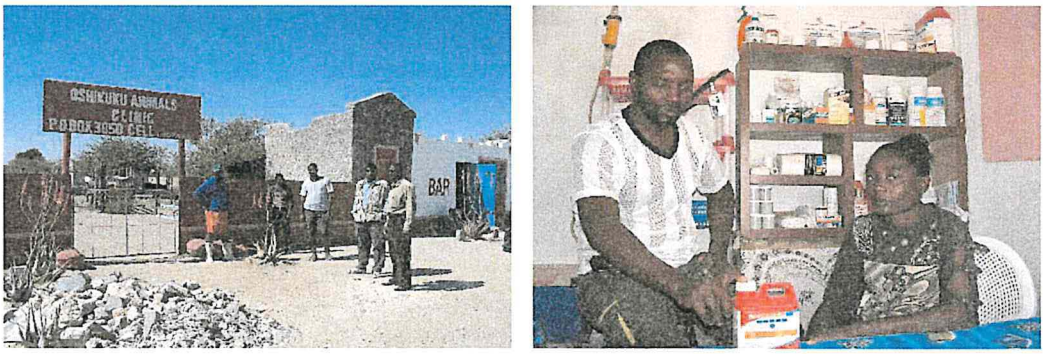


Fig. 7. Community animal health worker in Oshikuku (Outapi)

In the frame of the NOLIDEP, much attention was paid to equip and train the CAHW and monitor their activity. The usual training programme was an initial 3-week course and a 1-week refreshment course each subsequent year. Additional courses in epidemiology and priority diseases were provided by the NOREESP. After the initial training course, CAHW were given a kit containing posters, an automatic syringe, a Burdizzo's clamp and veterinary drugs.

Information flow

It is displayed on Fig. 9.

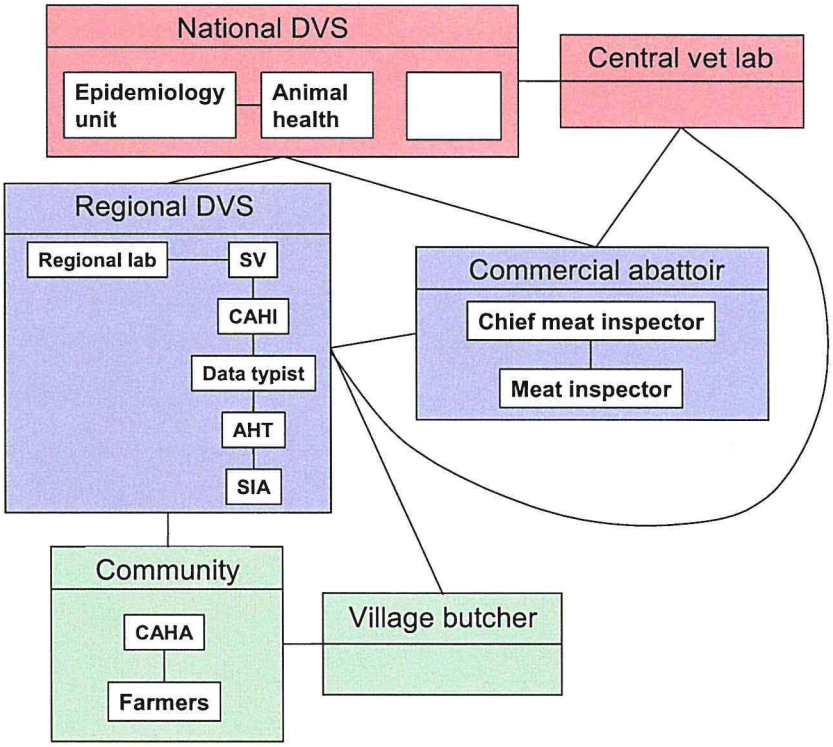


Fig. 8. Stakeholders of disease surveillance and their relationships in northen Namibia

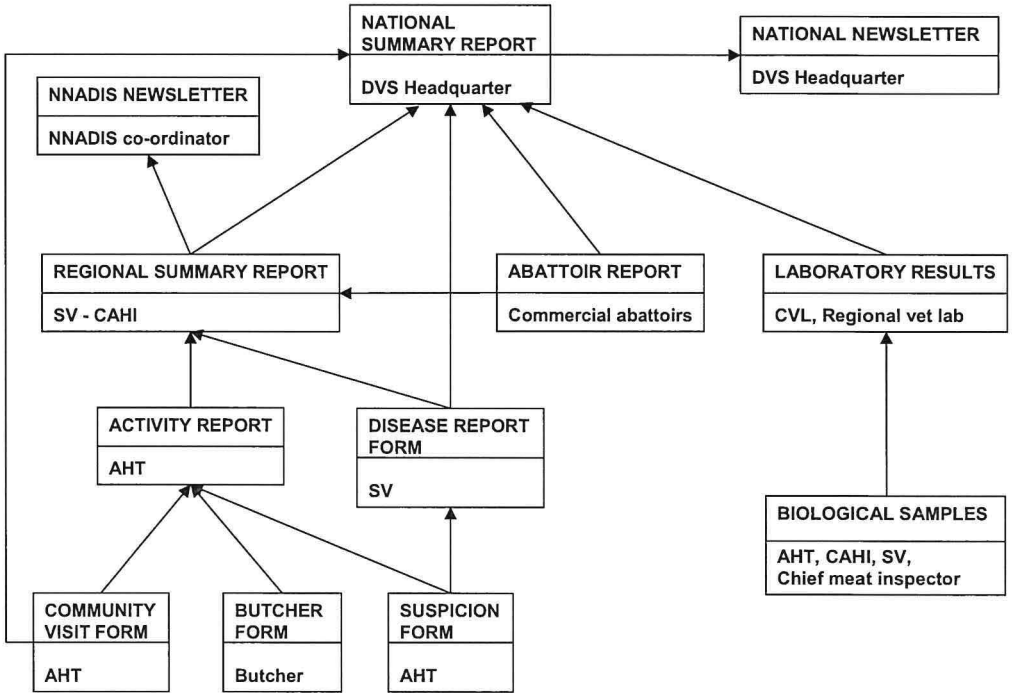


Fig. 9. Information flow generated by disease surveillance in northern Namibia.
Information are written in capital letters, in the upper part of each box; the authors of information are indicated in the lower part of each box.

Community visit and butcher forms are filled by the AHT. Suspicion forms are usually filled by the AHT after a community visit or preliminary investigation of a disease outbreak. They might also be filled at the occasion of the vaccination campaign, which is the only opportunity in the year to examine most of the cattle. Moreover, farmers may directly alert the SV or the CAHI to declare animal health problems. By the way, the importance of the role of CAHI must be highlighted. Their skill, and the seriousness of their work, are key points in the quality of disease surveillance.

In any case, SF must be validated by the SV before they become disease report forms (DRF), which are the only information taken into account at the national level. SV visit the farmers several times a week to check health information by themselves.

Biological samples are made when necessary to confirm the clinical and necropsy diagnostic. They are sent to the CVL, possibly with the quick delivery facilities (24 hours) available from the Namibian post. A regional laboratory will be equipped in Ondangwa in a near future, to confirm suspicions of some diseases (internal parasitism, anaplasmosis,...). A responsible was recruited to manage this new laboratory.

The CVL and DVS headquarter sometimes decide to implement complementary surveys. For instance, a large FMD serological survey is currently carried out with a laboratory test enabling the distinction between antibodies induced either by the vaccine or a wild strain of the virus. The goal is to demonstrate that no FMD virus circulates in northern Namibia, and consequently, to allow the removal of quarantine measures imposed on cattle before slaughtering. As a matter of fact, these quarantine measures are expensive both for the farmers and the meat company utilizing the abattoirs.

2.1.3. Analysis of the disease surveillance system

By definition, disease surveillance is a special kind of epidemiological survey aiming at monitoring the efficiency of control measures, and / or the frequency of diseases of special public-health interest. To get reliable statistics (incidence or prevalence rates, for instance), specific protocols must be designed and carefully implemented. In general, such surveys are expensive and their use is limited to a small number of diseases. Among the priority diseases retained in northern Namibia, CBPP, FMD, rabies, anthrax and possibly LSD might be subjected to disease surveillance protocols.

These protocols require declaration and investigation of all the suspicions. Therefore, a deep involvement of all the stakeholders is needed. With this respect, some shortcomings must be outlined:

- too few biological samples are sent to the CVL for the confirmation of clinical suspicions;
- each community is not visited every year. The least favorable situation is encountered in the North Central District, which is also the most densely populated area, and a high-risk area for CBPP and other trans-boundary diseases;
- the monitoring of CAHW and drug retailers is not achieved everywhere with the same regularity and quality, and few information arise from the village butchers.
- little control is carried out in cattle markets;
- health data are not collected enough during the vaccination campaigns;
- some AHT complain of the:
    - tedious aspect of the work for the field agents,
    - lack of interest of farmers for diseases not occurring in their own herds (CBPP, FMD,...).

Moreover, in the frame of disease surveillance, too little attention is paid to the direct examination of sick animals and use of laboratory tests to confirm the clinical and necropsy suspicions. For CBPP surveillance, a better use of abattoir data might be achieved by a more thorough survey protocol to characterize the lesions, define what kind of sample should be done and what laboratory analyses should be undertaken. However, an accurate estimation of CBPP incidence will necessitate a tighter control of bush butchers and slaughtering at the homestead level.

On the other hand, other kind of surveys are rarely undertaken in Namibia but might be useful in different circumstances:

- An example is the cross-sectional FMD serological survey which is currently done to prove the absence of FMD viral circulation in the northern regions.
- Other cross-sectional surveys might be carried out to rank the most important internal and external parasites according to the agro-ecosystem and season, and to derive prevention programmes (kind of drug to be used, date and frequency of administration).
- Clinical and serological surveys should also be carried out to investigate the true etiology of pasteurellosis (besides buffalo septicemic hemorrhage and bovine lung pasteurellosis). As a matter of fact, previous studies in many African countries have demonstrated that in small stocks, *Pasteurella spp.* were always

secondary contaminants after viral (e.g. peste des petits ruminants) or mycoplasma (e.g. caprine contagious pleuropneumonia) infections.

Beyond these shortcomings, it must be clearly stated that the disease surveillance system is excellent in northern Namibia, and that there is no doubt that the occurrence of any major disease would be quickly detected.

2.2. Data management

Data are summarised and utilized at different levels:

2.2.1. Animal health technicians

They report and summarize their activities in monthly activity report. These reports are presented and discussed during monthly meetings held at the regional DVS. During these meetings, the programme of the next month is planned and discussed, so that the assessment of AHT activity can be achieved through the comparison of planned and actual activities.

Community visit forms are summarized in the monthly activity report and the fulfilled forms are delivered to the regional DVS during the monthly regional meeting.

2.2.2. Regional DVS

The validation of suspicion forms into disease report forms is one of the major role of regional DVS in terms of management of health information. These data are summarized in monthly activity reports, together with the activity of AHT, including butcher forms and community visit forms. The latter are forwarded to the National DVS to make Windhoek aware of the amount of activity at the field level.

Data are also entered by data typist working with the CAHI and the SV. The purpose is to provide SV and national DVS with an accurate picture of field activity, through the computation of different performance indicators. An example of such performance indicators is shown in annex 6.7. Presently, data are entered with MS Excel spreadsheets. Though some data typist acquired a good skill during the NOREESP, this is not the general case and the quality and durability of the system is not guaranteed after the end of the project.

This situation might be improved by setting up a common database management system (DBMS) for all the regions, and training a core team both at the national and regional levels which would be responsible for its maintenance and development. A user-friendly system like Epi Info would be a good candidate for such a DBMS. It allows the design of forms without the need of any programming skill and automatically implements the database associated with the forms. Automatic reports and figures can be generated from small queries and routines which can be stored in the database.

These regional databases might also help to improve the feed-back to AHT and farmers, which seems to be insufficient with the present organization.

2.2.3. NNADIS

A semester newsletter is issued by the NNADIS coordination. It summarizes field activities and health information. Results of disease surveillance, vaccination campaign and community visits are presented and commented. General information are given as well as a technical presentation on a topic of interest for disease surveillance (botulism, mange in goats, internal parasites in small stocks,...).

A deficiency of the NNADIS newsletter, in its present form, is that it does not contain information on the final diagnosis of the suspicions (results from the lab). With this respect, more information are found in the monthly bulletin released by the National DVS (see below).

Another problem is that the writing and realization of the newsletter is very time-consuming for the NNADIS co-ordination. This results in a low frequency of the issues of the NNADIS newsletter, with respect to the initial previsions.

2.2.4. National DVS

Regional results are entered in a national database. National monthly summary reports are written from these results and sent to each Regional DVS within two weeks after the end of each month. The national database is also used to send reports to the OIE and other international organizations (SADC, FAO,...).

Moreover, the national DVS recently released a monthly newsletter (Vet News) which also briefly summarizes national health information.

The time and money spent for releasing the different newsletters and summary reports (national summary report, NNADIS Newsletter, Vet News) might be optimized, may be in merging NNADIS Newsletter and Vet News.

2.3. Coordination of the EIS

The interest of NNADIS is recognized at the national level, and the epidemiology unit in Windhoek is involved in the functioning of the NNADIS. It receives, stores and analyses the monthly reports from the state veterinarians, and sends them back the national summary reports.

For the purpose of the internal organization of the DVS, the NNADIS coordinator was moved from Ondangwa to Windhoek and was given the charge of further work. This new function and the increasing work charge associated with it let him little time for the actual co-ordination of the NNADIS.

Furthermore, he might attend a Master in Epidemiology in Great Britain or in South Africa, in September 2004 (GB) or January 2005 (RSA), at the time when no more technical assistance will be available from the French co-operation.

Thus, the coordination of the NNADIS might be problematic in a near future. In the case of the nomination of a temporary responsible for the NNADIS during the training course of Dr Natangwe, the new coordinator will need an adaptation period to have a global view and an operational knowledge of the NNADIS. Moreover, little time is left before the above-mentioned reckonings and it might be necessary to postpone the training course. An alternative solution would be to transfer the coordination responsibilities to the state veterinarians (at the regional level) and to the epidemiology unit in Windhoek (at the national level).

Because the Namibian EIS should be considered as a whole with respect to the international organizations (OIE, SADC, FAO,...) and partners (neighboring countries, commercial companies), information requirements and quality standards should be the same for the NNADIS and the rest of the national EIS. On the other hand, the Northern regions have peculiarities in terms of epidemiological situation (higher risk of trans-boundary diseases such as FMD and CBPP) and farming systems (densely populated areas with many smallholders managing low-input farms, generating low financial revenues). Therefore, it looks relevant to maintain two different disease surveillance systems to account for the specificities of the

commercial and smallholder sub-sectors. This option is presently implemented in the organogram of the Directorate of Veterinary Services.

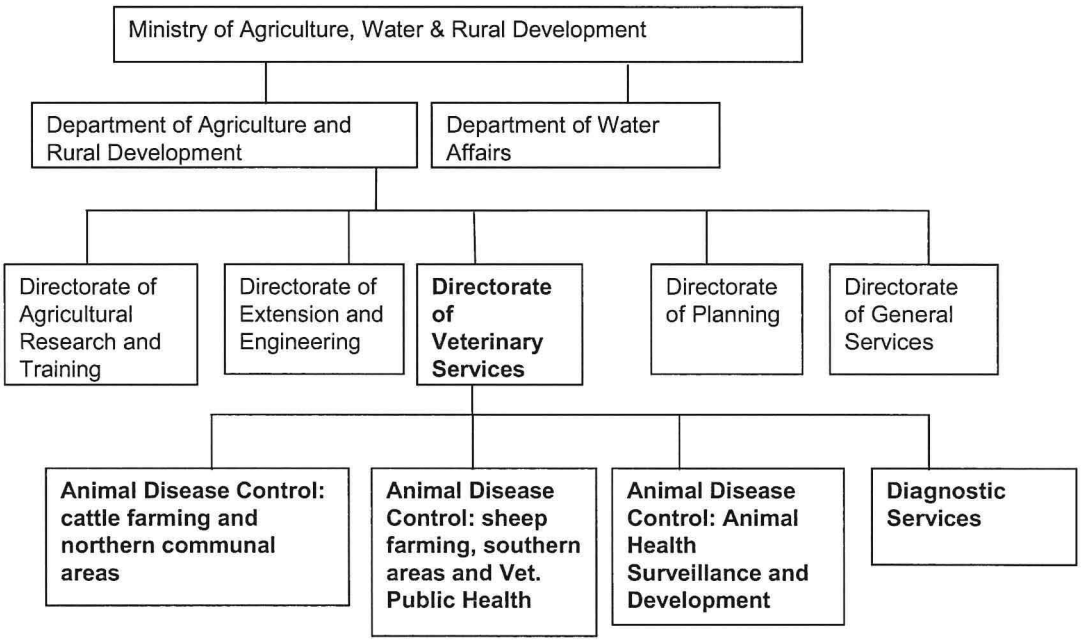


Fig. 10. Organogram of the Directorate of Veterinary Services (DVS, 2003)

2.4. Training

2.4.1. Field level

Smallholders are poorly educated with respect to animal health and husbandry. In particular, they do not seem to be aware of the difference between vaccine and antibiotics, or the possibility to prevent and / or treat most of the priority diseases. Therefore, the demand in veterinary drugs is still low, which is an important limiting factor to the privatisation of veterinary services.

With this situation, the role of CAHW should be prominent, as an intermediate between smallholders and AHT. Unfortunately, they are not numerous enough to fully play this role and their training and skill are too heterogeneous. Rather than a mass training of many CAHW, it would be more relevant to implement a high-quality policy for the CAHW:

- careful selection of candidates among community members,
- adequate initial training and equipment to properly launch their activity,
- close follow-up of their activity by AHT, and regular refreshment courses in animal health and husbandry (including branding, for example).

2.4.2. Regional level

A large effort was done, and success was encountered at all the levels affordable by the project, to improve the skills in animal health, basic epidemiology and organization. The result is that training and skill of vet staff look adequate in term of animal health for the present activities. In particular, the SV have a clear understanding of the NNADIS design and functioning.

However, further training might be necessary in epidemiology and statistics, in the perspective of the implementation of a wider range of epidemiological surveys.

The purpose of this training would be to provide the state vets and CAHI with sufficient knowledge for:

- a full understanding of the rationale of the epidemiological protocols (sampling frame, meaning of the health indicators,...),
- use and maintenance of regional databases to compute performance indicators as shown in annex 6.7,
- interpret the performance indicators and take appropriate actions according to what they point to,
- plan and animate community or professional meetings.

3. Suggestions for improvement and sustainability of the NNADIS

For the sake of clarity, the suggestions made to improve the NNADIS and ensure its sustainability are briefly recalled thereafter.

3.1. Epidemiological protocols

- Restrict the surveillance *sensu stricto* to diseases which would either:
  - have major consequences in international trade (e.g. FMD, CBPP),
  - or are actual / potential Public Health problems (e.g. rabies, anthrax).
- Optimise the use of slaughterhouse and butcher data in the surveillance of CBPP
  - Systematic sample and lab analysis of any suspect lesion,
  - Trace back any positive case (acute or chronic),
  - Random sample of butchers and implementation of surveys to measure the frequency of lung lesions.
- Use random sample surveys (e.g. at the occasion of vaccination campaigns) to:
  - assess the trends of prevalent diseases (botulism, black quarter, parasitism) for which actions are taken,
  - check the existence of diseases which are reported without positive laboratory diagnosis (e.g. anaplasmosis),
  - detect symptoms, lesions and / or antibodies showing the existence of newly introduced or emerging diseases: e.g. RVF, CPPP, PPR.
- Strengthen the implication of the CVL (and future regional lab) in the confirmation of clinical and / or necropsy suspicions (namely CBPP at the Oshakati slaughterhouse).

3.2. Disease surveillance

- Visit each community at least once a year in regions where it is possible; otherwise (North Central District), set up a list of all the communities, draw a random sample out of it and visit the selected communities.
- The activity of all the CAHW and drug retailers should be more tightly monitored by the AHT.
- Strengthen the presence of AHT in the cattle markets.

3.3. Data standardization, information flow and newsletter

- Revise the duty sheet of CAHT for a better account of disease reporting.
- Reinforce the control of the activities of CAHT.
- Improve the interface of the regional databases for safer data entry and automatic reporting of animal health data and performance indicators.
- Reporting should be simplified as far as possible (e.g. is it necessary to report community visit forms at the national level ?).
- Presentation of new laboratory results should be on the agenda of each monthly meeting at the regional level.

3.4. NNADIS sustainability

- The SV should use the performance indicators:

  - to manage the activity of CAHI and AHT,
  - to present their activity in the NNADIS technical committee.
- The NNADIS should be more integrated in the national EIS.
- As a consequence, the NNADIS newsletter should be merged with Vet News.

3.5. Training

- Set up a national plan for training in data management, basic statistics and epidemiology for the SV and CAHT.
- Assess the needs for regional and national databases and acquire the skills to implement and maintain them.

4. Conclusion

I was very impressed by the quality of disease surveillance implemented in Northern Namibia. This success is the result of a highly mature co-operation, both in spirit and practice, between the Directorate of Veterinary Services and the NOREESP project.

In this context, I am very confident in the ability of the Namibian veterinary services to define the best methods and means to maintain and improve their epidemiological information system. I hope that this mission and report will be of some usefulness with respect to this goal and to the three major forthcoming challenges:

- achieve the eradication of CBPP and FMD to improve farmers' income in northern Namibia and a better protection of the national livestock;
- lower the incidence of endemic diseases like botulism, black quarter, internal parasitism, mange,... to an economically acceptable level, to improve smallholders' income and nutrition level,
- account for the foreseeable privatisation of veterinary services.

5. Acknowledgements

I warmly thank the Director of the Directorate of Veterinary Services, all the staff in Windhoek and the regional DVS representatives for their help and fruitful collaboration.

I did appreciate the help and perfect organization provided by the NOREESP project and the French Embassy in Windhoek (Service de Coopération et d'Action Culturelle), with a particular mention for Dr F. Goutard, technical assistant in the NOREESP.

6. Annexes

6.1. Terms of reference

6.1.1. General information

Project	Northern Research in Extension and Epidemiology Support Project (NOREESP), Component 2
Objectives	Support to the Epidemiological Information System (EIS) in the northern communal areas.
Localisation	Kunene North, North Central Division, Kavango and Caprivi
Duration	From the 21st of June to the 30th of June, 10 days

6.1.2. Background of the project

During the discussions on the design of NOREESP, in 1998, veterinary services requested the French Co-operation to provide support in strengthening the EIS in communal area, with a start in North Central Regions where the French Co-operation use to work in. These discussions led to the incorporation of a veterinary component (second component) in the project, which started in November 1999 with the arrival of the French Technical Assistance (2 veterinarians specialized in Epidemiology). At its inception, the component main objective was to develop an efficient adaptation of the national EIS in NCD, seen as a pilot phase for the development of EIS in all northern communal areas.

During the first two years of the project span, the new EIS was conceived, adapted, implemented and tested in the North Central Regions. Since the results of these activities were successfully, the veterinary services requested the French Co-operation to extend NOREESP support to the other northern communal regions, in order to harmonise the surveillance system for all the Northern communal areas in a comprehensive way.

6.1.3. Context of the mission

Since the beginning of the project three support missions were performed by the CIRAD-Emvt in order to help the technical assistants to implement a comprehensive surveillance network. The last mission was carried out in September 2002 just after implementation of the EIS in the whole Northern Communal Areas. The NNADIS (Northern Namibia Animal Diseases Information System) is now effective since 18 months. All the DVS staff have been trained, they are carrying out the same surveillance activities and every DVS office is reporting to the Headquarter the same way. The NOREESP is finishing in July 2004 after 4.5 years of activity and will be not extended by any other project in rural development. In the future some surveillance activities will be financially supported by the NASSP (EU project) but the whole system is now completely taken over by the Namibia DVS.

6.1.4. Objectives of the mission

EIS component	Objective
Disease surveillance	Specific surveillance protocols (diseases, forms…)
	Activities carried on
	Performance indicators
Information system	Standardization of the data
	Flow of information
	Feed-back to stakeholders
	Newsletter
Sustainability	Coordination at the local level
	Coordination at the national level
	Role of the coordinator
	Appropriation of the EIS by the Namibian DVS
Training	Diagnostic of needs

6.2. Schedule

Date	Time	Morning	Time	Afternoon
21/06	08h45	Arrival in Windhoek from Johannesburg	13h15	Lunch with M. Jouve, Dr Goutard
	12h00	Meeting at the CVL with Dr Hubschle	15h30	Meeting with the Epidemiology Unit at the Head of DVS
22/06	7h00	Departure Katima (plane)	14h00	Meeting at the DVS of Katima
23/06	7h30	Visit of Meat-co abattoir in Katima community meeting in Sekugwe, meeting of a butcher in Bukalo, CAHW meeting in Kabbe	15h00	Office work in Katima
24/06	8h00	Meeting with SV in Katima Departure to Rundu (car)	12h00 16h00	Butcher meeting at Divundu Arrival in Rundu Meeting with the DVS
25/06	8h00	Community meeting + CAHW meeting	14h00	Meeting with Dr Shuro (SV)
			15h00	Meeting with M. Mulhoho (CAHI)
26/06	10h00	Departure for Ondangwa (car)		
27/06		Writing report		Writing report
28/06	8h00	Vaccination campaign visit + drug retailer + CAHW	14h00	Meeting with Dr Masaire (SV)*
			15h00	M. Shaumbwa and M.Syioka (CAHIs)
29/06	9h00	Meeting with Dr Sibbanda (SV Outapi) and M. Tapopi (CAHI)	14:30 17h00	Visit of Meat-co abattoir in Oshakati (Dr Bula) Departure for Windhoek (plane)
30/06	8h00 10h00	Meeting with Dr Norval, Director of DVS Restitution at the Head office of DVS	13h00 14h30	Lunch with all the participant of the meeting Meeting with M. Jouve, head of SCAC Writing report at the French Ambassy
01/07	12h00	Departure from Windhoek to Johannesburg		

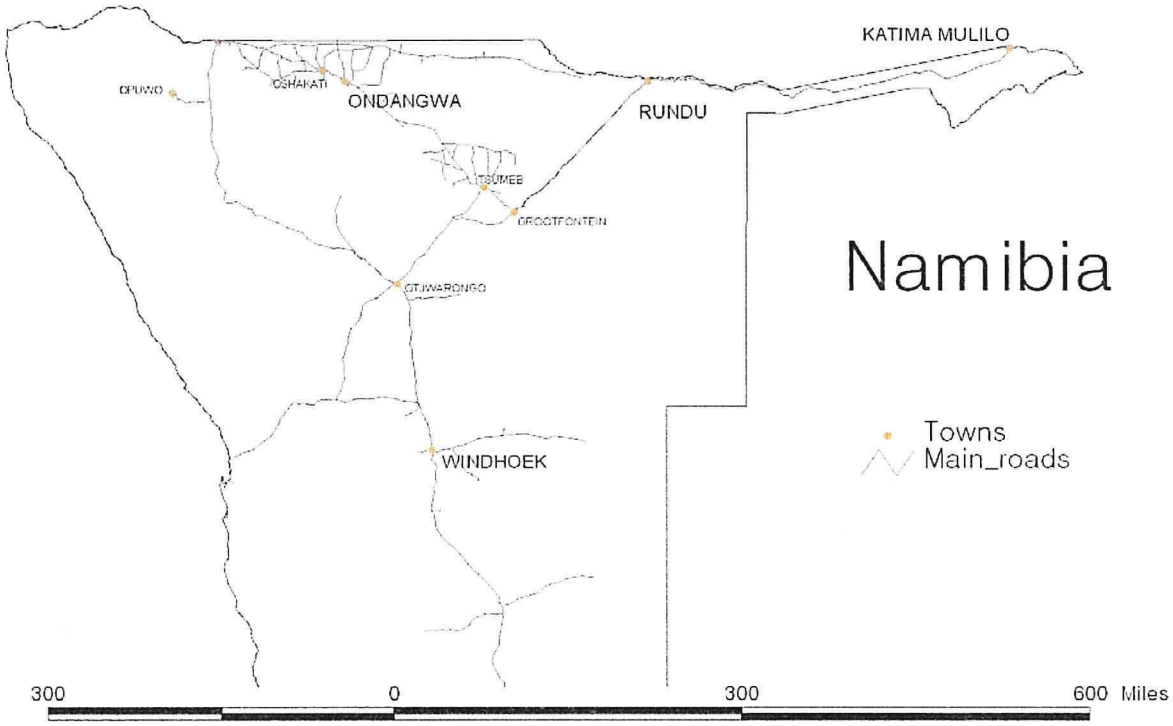
6.3. People met

Name	Position
Windhoek	
Dr AMUTHENU	Co-ordinator of the NOREESP project
Dr BAMHARE	Deputy Director, DVS
Dr GOUTARD ([1])	Technical assistant, NOREESP
Dr HUBSCHLE	Director of the CVL
Dr JOUBERT	Deputy Director, Head of DVS
M. JOUVE	Head of SCAC, French Embassy
M. RIGOURD	Technical assistant, Rural Development, SCAC, French Embassy
Katima	
M. CHILINDA	Chief Animal Health Inspector, Katima, Caprivi Veterinary Services
Dr NKANDAWIRE	State veterinarian, Katima, Caprivi Veterinary Services
Rundu	
M. MULHOHO	Chief Animal Health Inspector, Rundu, Okavongo Veterinary Services
Dr SHURO	State Veterinarian, Rundu, Okavongo Veterinary Services
Ondangwa	
Dr MASAIRE	State Veterinarian, Ondangwa, NCD Veterinary Services
M. SHAUMBWA	Chief Animal Health Inspector, Oshana region, NCD Veterinary Services
M. SIYOKA	Chief Animal Health Inspector, Oshikoto region , NCD Veterinary Services
Outapi	
Dr SIBBINDA	State Veterinarian, Outapi, Omusati region
M. TAPOPI	Chief Animal Health Inspector, Outapi, Omusati region
Oshakati	
Dr BULA	State Veterinarian, Meat-co Abattoir, Oshakati

([1]) Dr GOUTARD organized the mission and meetings.

6.4. Places visited during the mission.

The name of visited places is capitalized.



6.5. List of diseases submitted to general regulations in Namibia

Disease	**Animals susceptible**
African swine fever	Pigs, wild pigs, warthogs and bushpigs
Anthrax	Cattle, sheep, goats, pigs, horses, mules, donkeys, game and ostriches
Aujeszky's disease	Pigs
Avian influenza (fowl plague)	Poultry and birds including ostriches
Bovine malignant catarrh	Cattle, wildebeest (gnu)
Brucellosis	Cattle, sheep, goats, pigs and dogs
Contagious bovine pleuropneumonia	Cattle, buffalo and water buffalo
Contagious equine metritis	Horses, mules, donkeys and zebras
Corridor of buffalo disease	Cattle and buffalo
Dourine	Horses, mules, donkeys and zebras
Equine infectious anaemia	Horses, mules, donkeys and zebras
Equine viral arteritis	Horses, mules, donkeys and zebras
Foot and mouth disease	Cattle, sheep, goats, pigs, other cloven-hoofed animals and elephants
Glanders (farcy)	Horses, mules, donkeys and zebras
Hog cholera	Pigs, wild pigs, warthogs and bushpigs
Johne's disease	Cattle and sheep
Mange (*Psoroptes*)	Cattle and goats
Nagana	Cattle, pigs, dogs, horses, mules and donkeys
Newcastle disease	Poultry and birds, including ostriches
Psittacosis (ornithosis)	Poultry and birds
Rabies	Dogs, cats and wild carnivores, cattle, sheep, goats, pigs, horses, mules and donkeys
Rift valley fever	Cattle, sheep and goats
Rinderpest	Cattle and other cloven-hoofed animals
Scrapie	Sheep and goats
Sheep scab (*Psoroptes ovis*)	Sheep and goats
Swine vesicular disease	Pigs
Tuberculosis	Cattle, pigs and fowls

6.6. Duty sheets of disease surveillance stakeholders in northern Namibia

6.6.1. Stock inspector assistants

- Inform the AHT or CAHI about the suspicions of any priority disease.
- Fill the case register with all the reported or investigated cases of diseases.

6.6.2. Rundu laboratory work hand

- Collect and record with reference number all the samples taken in Kavango received at Rundu, analysed locally or sent to the CVL.
- Forward other samples to the CVL with appropriate packaging and timing.
- Register and file all the lab results for Kavango (performed in SV office or coming from the CVL).
- When requested, deliver results to farmers or to the DVS staff involved in the suspicion.

6.6.3. Data typists

- Receive activity reports (AR), community visit forms (CVF), monthly planning and butcher forms (BF) from CAHI.
- Receive suspicion forms (SF) from SV once checked and possibly translated into disease report form (DRF).
- Compile monthly planning in one monthly planning summary.
- Enter data from CVF, SF, BF and AR one week after reception at the most.
- Forward CVF to head office every week, keeps a copy of the first page of CVF and file it.
- File SF, AR and BF once used.
- Send monthly planning and the monthly planning summary back to the CAHI.

6.6.4. Animal health technicians

- Fill the SF in case of priority disease (CBPP, FMD, rabies, mange, botulism, black quarter, Newcastle disease and internal parasites).
- Take appropriate samples to confirm the suspicion (except for botulism, black quarter and FMD).
- Send the SF and samples, if any, to the SV as quickly as possible, according to the time frame of surveillance protocols.
- Collect information from CAHW, fill in SF and implement further field investigation if necessary (including the samples). Send these SF and samples, if any, to the SV as quickly as possible.
- Lab results and explanations are made available at the office for the farmers (case registers).
- Direct contact is made with the farmers in case of confirmed high priority diseases (rabies, FMD, CBPP and Newcastle disease).
- Visit at least 10 communities in a month and fill the CVF during the visit.
- Hand the CVF to the CAHI at least once a month.
- Implement at least one CAHW supervision visit per month.

- If trained for meat hygiene, must visit every butcher and collect BF once a month in his area. Implement further field investigation if necessary (sampling, tracing back of cases). Send BF and samples to the SV as quickly as possible.
- Maintain regular contact with the AET (planning of CV, reporting of disease suspicions).
- Fill every month the AR and forward it to the CAHI during monthly meetings.
- Fill monthly planning before monthly meeting.
- Fill the case register with all the reported of investigated cases of diseases.
- Give AR report and monthly planning to the CAHI and bring the case register (or a copy) for monthly meetings.
- Attend monthly meetings.
- Co-ordinates surveillance activities in his area.
- Train other SIA in disease surveillance (recognition of priority diseases, declaration, advices to farmers, fill case register.

6.6.5. Chief animal health inspectors

- Organise and facilitate the monthly meeting.
- Check CVF and BF. Check and sign AR (compare them with the related planning).
- Compile the AR in an activity report summary, and forward it to the SV with his monthly report.
- Forward AR to the data typist.
- Check the monthly planning and make recommendation to the SV.
- Plan for supervision and field control of surveillance activities of AHT (according to monthly planning).
- In the absence of AHT, assume the duty of filling suspicions forms, taking the samples and sending the data to the SV.
- Forward monthly planning, CVF and BF to the data typist.
- Check the SF if they are handled over to them by staff.
- Collect information and write articles for the bi-annual newsletter.

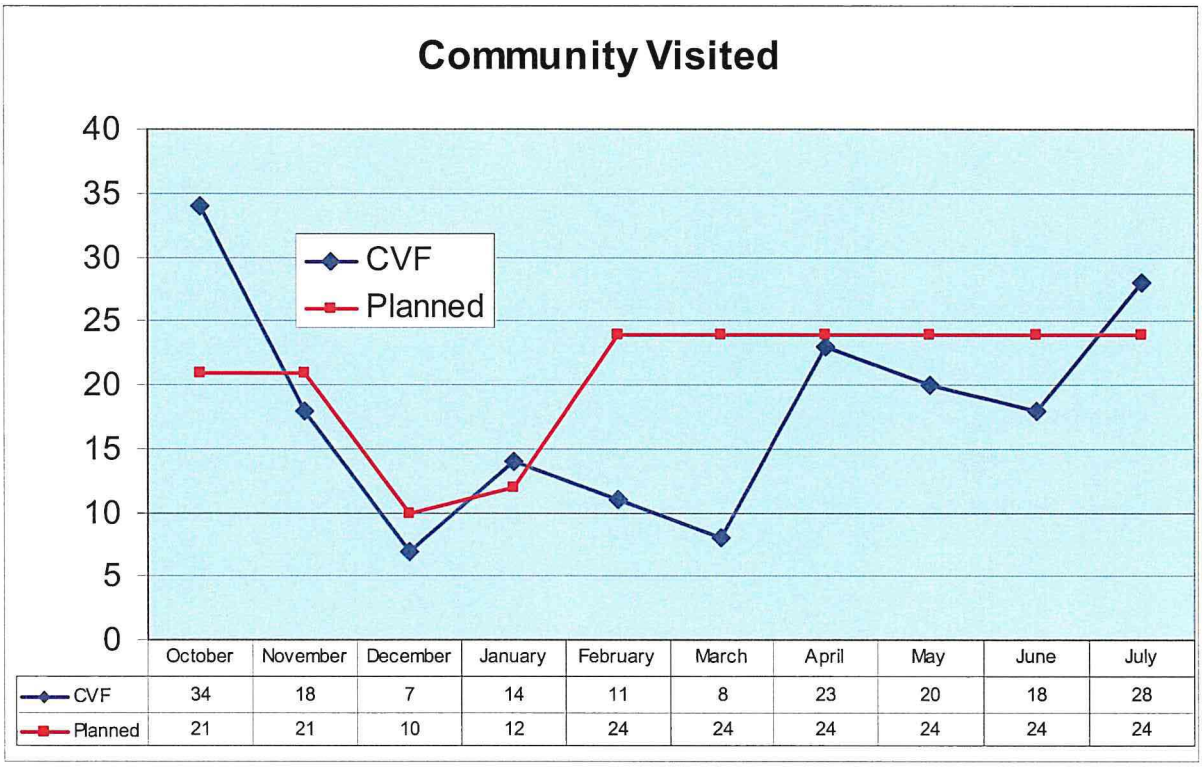
6.6.6. State veterinarians

- Chair the monthly meeting of AHT.
- Give the final approval to the monthly planning for the next month.
- Receive, check and file AR summary coming from the CAHI. Include information in his monthly report.
- Receive, check and evaluate all the SF and samples coming from the field.
- Translate the SF into a DRF if correctly filled.
- Send the samples with the DRF to the appropriate lab according to the surveillance protocols (make sure that sufficient information is provided).
- Send the DRF to the DVS headquarter in Windhoek as usual on a weekly basis.
- Fill the "Action taken" part on the SF:

  - DRF is filled from the SF.
  - No DRF is filled if information is not adequate (non priority disease or obvious mistake in the suspicion diagnostic).
  - Further field investigation is implemented to complete data and / or to take samples.
- After use, forward the SF to the data typist.
- In case of a positive result of high priority diseases, take direct contact with farmers and performs epidemiological surveys when mentioned in the protocols.
- Collect information and write articles for the bi-annual newsletter.
- Check the samples for quality (choice, quantity, preservation), according to reference methodology made available by CVL and record samples.
- Perform analysis for agreed priority diseases (mange, internal parasites,...).
- Provide AHT with lab results.
- Process data, print results and forward to the co-ordinator every month.

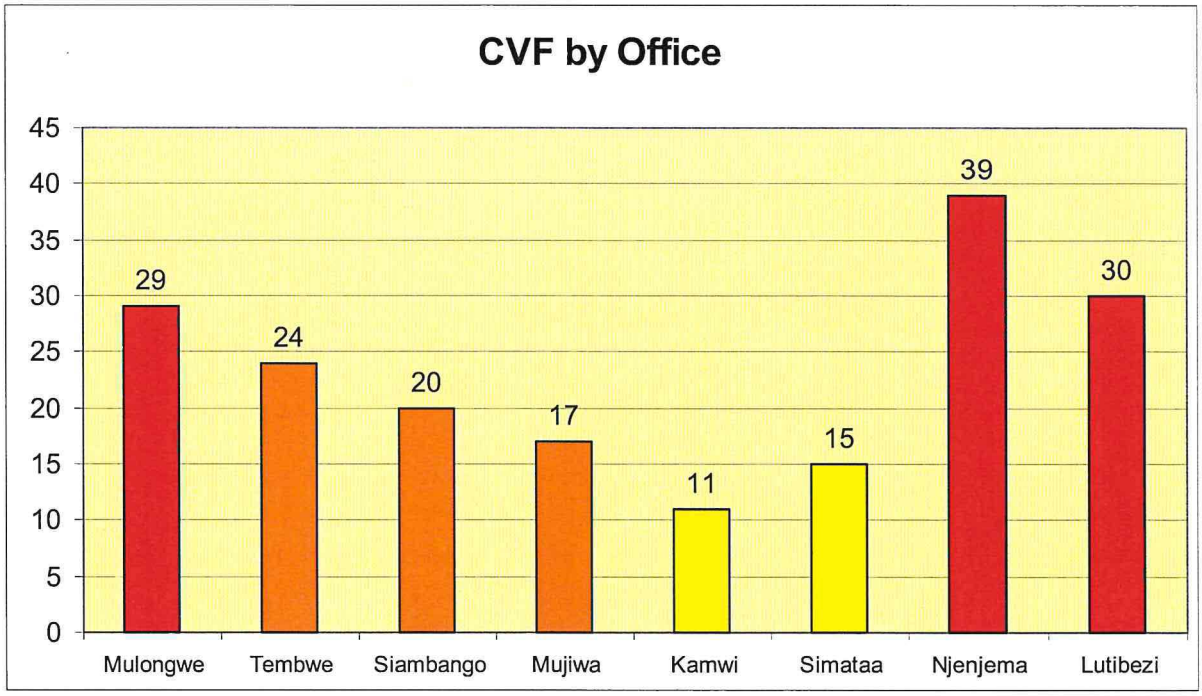
6.7. Performance indicators for Caprivi from October 2002 to July 2003

6.7.1. Community visits

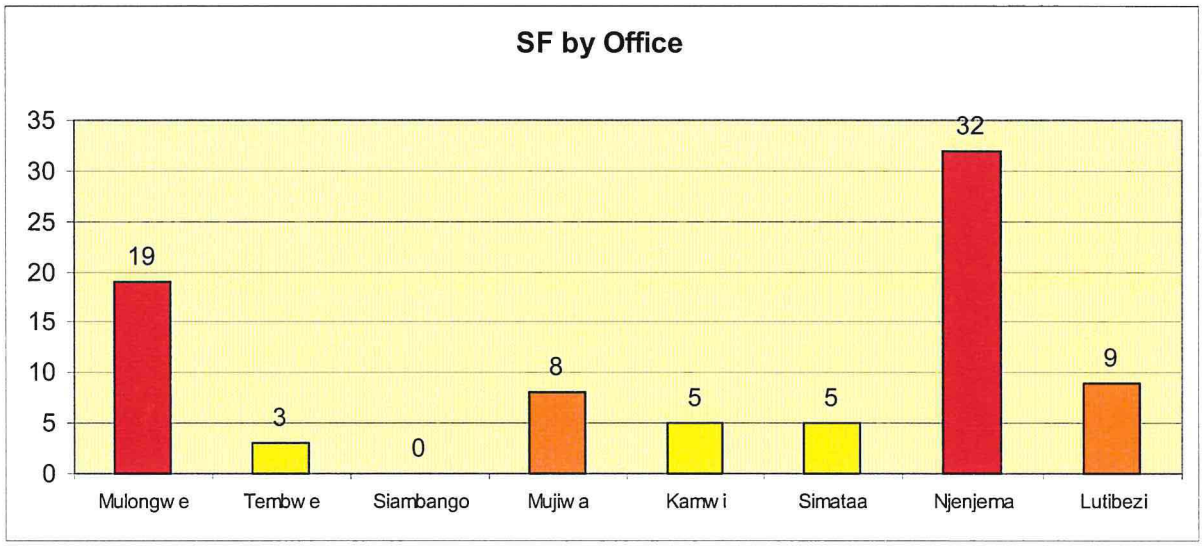


	October	November	December	January	February	March	April	May	June	July
CVF	34	18	7	14	11	8	23	20	18	28
Planned	21	21	10	12	24	24	24	24	24	24

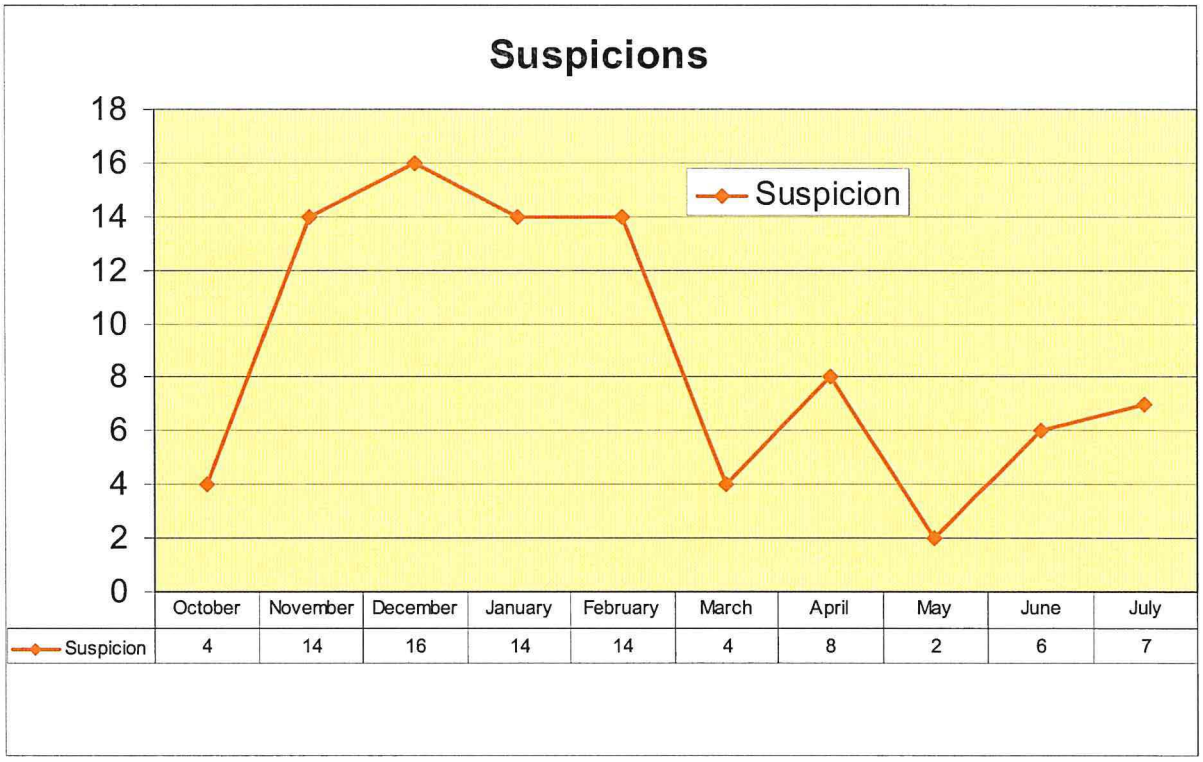
6.7.2. Community visits by office



6.7.3. Suspicion forms by office

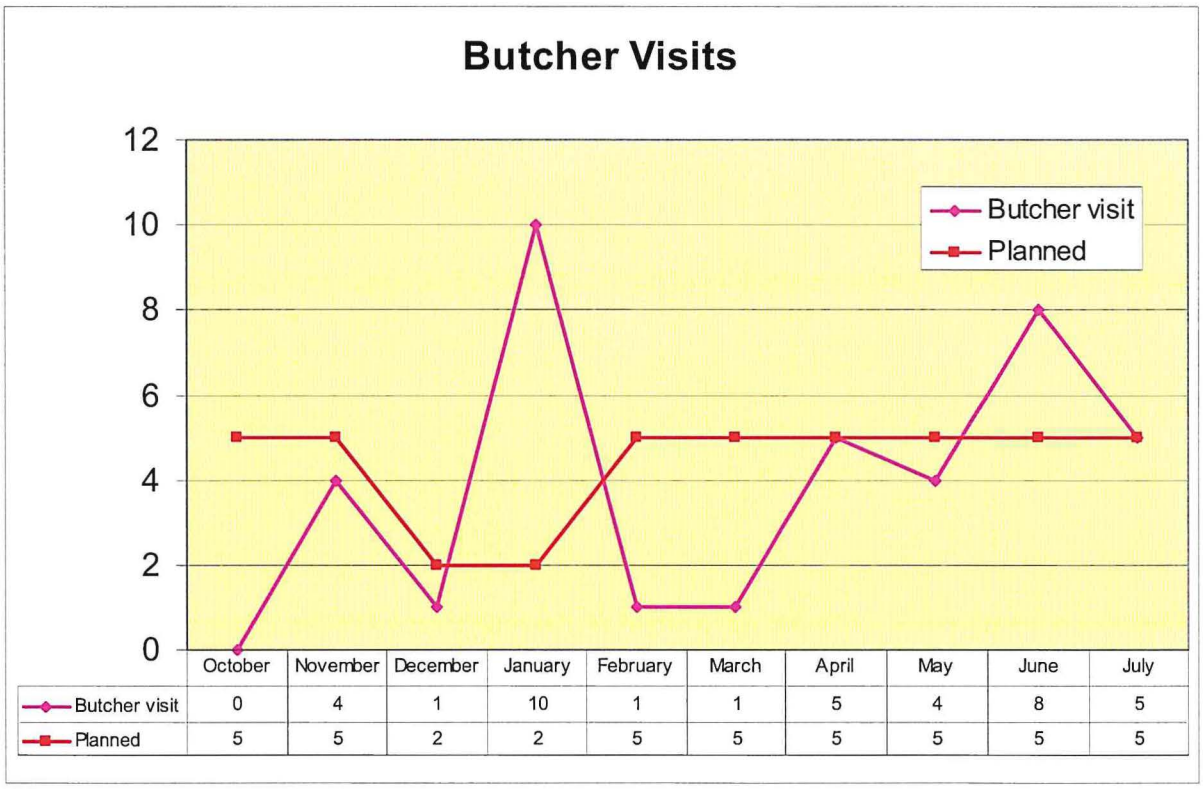


6.7.4. Seasonal variations in suspicions



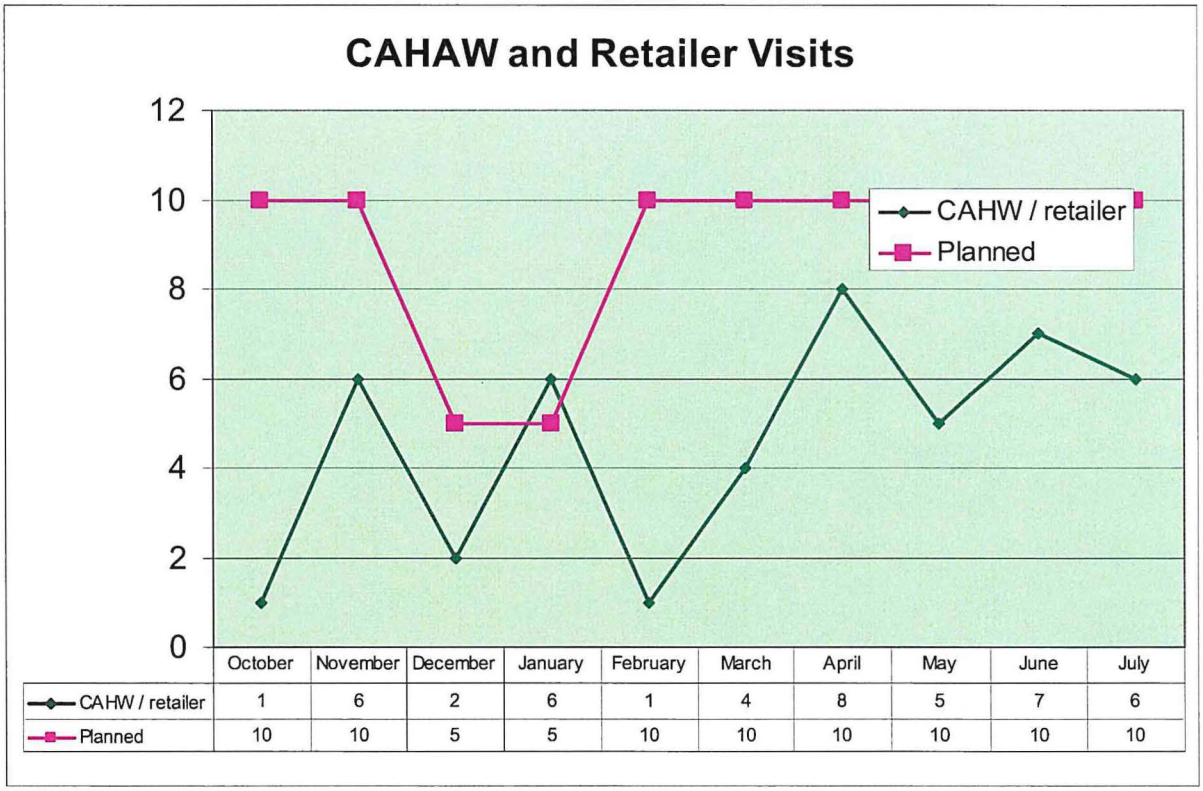
	October	November	December	January	February	March	April	May	June	July
Suspicion	4	14	16	14	14	4	8	2	6	7

6.7.5. Butcher visits



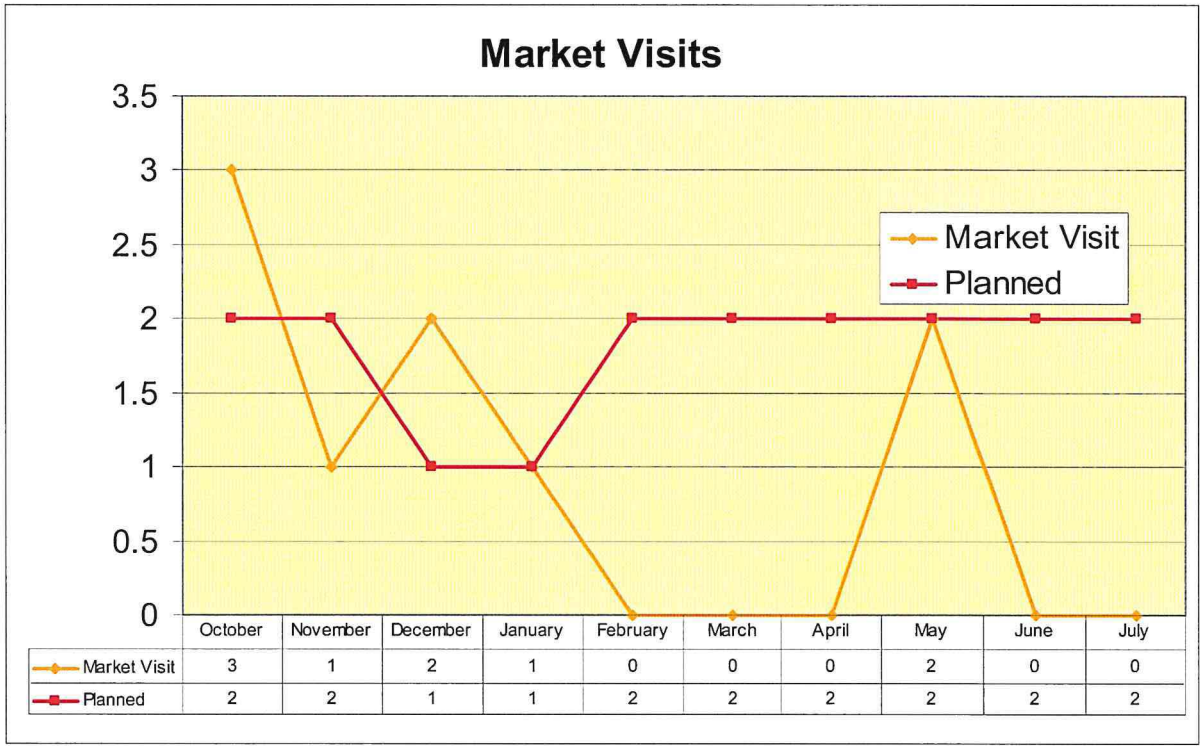
	October	November	December	January	February	March	April	May	June	July
Butcher visit	0	4	1	10	1	1	5	4	8	5
Planned	5	5	2	2	5	5	5	5	5	5

6.7.6. Visits of community animal health agents and drug retailers



	October	November	December	January	February	March	April	May	June	July
CAHW / retailer	1	6	2	6	1	4	8	5	7	6
Planned	10	10	5	5	10	10	10	10	10	10

6.7.7. Market visits



6.7.8. Numeric summary of all the performance indicators

Month	CVF	Planned	Rabies vacc	Market Visit	Planned	CAHW / retailer	Planned	Butcher visit	Planned	Suspicion	Samples
October	34	21	0	3	2	1	10	0	5	4	0
November	18	21	122	1	2	6	10	4	5	14	6
December	7	10	0	2	1	2	5	1	2	16	5
January	14	12	131	1	1	6	5	10	2	14	13
February	11	24	13	0	2	1	10	1	5	14	4
March	8	24	10	0	2	4	10	1	5	4	1
April	23	24	105	0	2	8	10	5	5	8	1
May	20	24	875	2	2	5	10	4	5	2	4
June	18	24	319	0	2	7	10	8	5	6	1
July	28	24	258	0	2	6	10	5	5	7	0
Total	**181**	**208**	**1833**	**9**	**18**	**46**	**90**	**39**	**44**	**89**	**35**
Plan	**185**			**18**		**90**		**44**			
	98%			50%		50%		80%			

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