



## FURTHER OBSERVATIONS ON THE IMPACT OF A VETERINARY PROGRAMME IN AFGHANISTAN ON SEASONAL LIVESTOCK MORTALITY

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### ABSTRACT

Schreuder, B.E.C., Noorman, N., Halimi, M., Van Dommelen, M., Hennecken, M. and Wassink, G., 1998. Further observations on the impact of a veterinary programme in Afghanistan on seasonal livestock mortality. *Tropical Animal Health and Production*, **30**(2), 83–89.

This paper reports further results of a two year livestock mortality survey in Afghanistan, where a war of more than a decade had completely disrupted the veterinary field services. A questionnaire-based survey to measure the impact of a veterinary field programme indicated that average annual mortality in cattle, sheep, and goats was substantially lower in districts that received veterinary services (covered districts) than in districts without any veterinary services (control districts). The impact of the programme varies according to the season and the age group of the animals involved. The programme lacked impact in winter, in particular in adult small ruminants. The highest impact was noted in the spring and autumn for adult goats, and summer and autumn for adult sheep.

The impact of the programme was also limited (in small ruminants even completely absent) during the suckling period in young animals. The highest impact was noted in the post-weaning period in small ruminants, when approximately four times more lambs and kids died in the control districts than in the covered districts.

It was concluded that the major impact of the veterinary programme was achieved when animals are in contact with other flocks during grazing seasons, when parasitic and infectious diseases are present and against which the veterinary programme is directed. Additional inputs – including extension activities – are therefore required to improve the effect of the programme in the winter and in the neonatal period.

### INTRODUCTION

Livestock are crucial to the economy of Afghanistan, providing food and income to more than 80% of the population. In December 1979 the Soviet Union invaded Afghanistan, triggering a decade of war that resulted in the complete destruction of the country's infrastructure. In rural areas veterinary services were totally disrupted. The devastating effect of the war on the livestock population as well as details of the veterinary programme implemented by the Dutch Committee for Afghanistan (DCA), have been described (Schreuder *et al.*, 1996b).

The programme comprised integrated practical training, deployment, and technical and logistic support for veterinary auxiliary personnel (paravets). Their tasks were primarily in preventive veterinary medicine: vaccination against the major infectious

diseases in large and small ruminants (e.g. anthrax, blackleg, haemorrhagic septicæmia, enterotoxaemia, and other clostridial diseases) and poultry (Newcastle disease), as well as the administration of antiparasitic drugs against nematodes and liver flukes.

The impact on livestock mortality and an economic assessment of the total programme have been described (Schreuder *et al.*, 1996a,b). The present paper reports further results on the season in which mortality occurred and, in the case of young animals, on the age of the animals involved.

## MATERIALS AND METHODS

The present study uses survey material and methods described previously (Schreuder *et al.*, 1996b). The study consisted of a farmers' questionnaire survey on livestock mortality and productivity over 2 years in 4 districts where veterinary activities initially started (covered districts), using as control districts four adjacent or nearby districts that had been devoid of organized veterinary care for more than 10 years. The covered and control districts had similar ecological conditions, animal husbandry practices, and effects of war, so allowing a comparison between pairs of districts.

Within each district, 3 villages were randomly selected. In each selected village, 30 farmers considered to be representative for the whole village were interviewed. During the summer and early autumn of 1992 more than 700 farmers were interviewed by enumerators hired from outside DCA. The questionnaire survey included questions on the season in which animals died and their age, and was wholly based on farmers' recollection.

Annual mortality in different age groups has been described in detail (Schreuder *et al.*, 1996b). Livestock mortality for all age groups was categorized by season, while mortality in young animals was also surveyed in relation to suckling and weaning. Mortality in small ruminants was categorized into 3 periods: before, during, and after weaning. In Afghanistan small ruminants are weaned gradually by increasing the quantity of milk collected for human consumption. Calf mortality was categorized into the first 1–4 weeks of the suckling period, the following 1–6 months, and the period thereafter.

In this paper the overall results of the survey are presented. Estimates of mean mortality for each district were obtained by taking the number of deaths as a proportion of the number of animals for each of the 3 villages together. All results were processed using the Lotus spreadsheet programme. A  $\chi^2$  contingency table was used for assessing statistical differences between the groups of covered and control districts. Clustering beyond the level of individual villages appeared not to play a role (discussed in Schreuder *et al.*, 1996a), for which reason it was considered fitting to analyse at district level.

## RESULTS

The original survey was carried out in 4 pairs of districts in 4 different provinces. The overall livestock mortality differed by roughly one-quarter to one-half, depending on the species or age category, all in favour of the covered districts ( $p < 0.01$  for cattle and  $p < 0.001$  for small ruminants) (Schreuder *et al.*, 1996b). In one district, however, the questions related to seasonal mortality and age of death in young animals were not completed. The results presented below are therefore based on data from three pairs of districts only.

### *Seasonal distribution of mortality in adult livestock*

In the covered districts, mortality for adult animals of all investigated species peaked in the winter, whereas in the control districts mortality peaked depending on the species: in goats in the spring, sheep in the autumn, and only cattle in the winter (Figure 1).

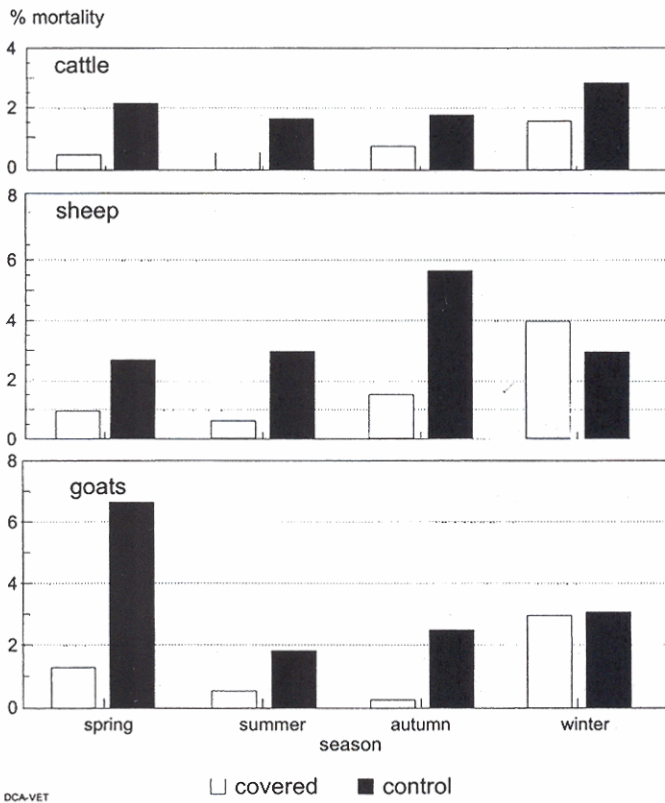


Figure 1. Seasonal distribution of adult livestock mortality in 3 pairs of districts in Afghanistan. Numbers of deaths/animals at risk, in covered and (control) districts: cattle 49/1452 (152/1800); sheep 629/9063 (1785/12 693); goats 308/6043 (1733/12 295)

## Cattle

In adult cattle, the seasonal mortality in covered and control districts showed a comparable pattern: in both groups, most animals died in the winter. In all four seasons, mortality was significantly higher in the control districts than in the covered districts ( $p < 0.05$ ).

## Sheep

During spring, summer and autumn, adult mortality in the control group was more than twice as high as that of the covered group ( $p < 0.01$ ). In the winter season, however, the covered districts showed a higher mortality ( $p < 0.05$ ). In the control districts, most sheep died in the autumn whereas in the covered districts most died in the winter.

## Goats

Differences in adult goat mortality between the two groups of districts were found mainly in the spring, summer and autumn when the control group showed a highly significant higher mortality ( $p < 0.01$ ). The largest difference was found in the spring season when the control group showed a mortality four times that of the covered group. In the winter no significant difference existed between the two groups ( $p = 0.78$ ).

### *Mortality in young animals (Figure 2)*

#### Calves

Calf mortality was significantly higher ( $p < 0.01$ ) in the control group during the neonatal period (0–4 weeks old) and the period from 1–6 months. Beyond 6 months, no significant difference existed.

#### Lambs

Mortality in lambs started off significantly higher ( $p < 0.01$ ) in the covered districts, became (almost) equal in both groups in the period around weaning ( $p = 0.3$ ), and ended up much higher in the control districts ( $p < 0.01$ ).

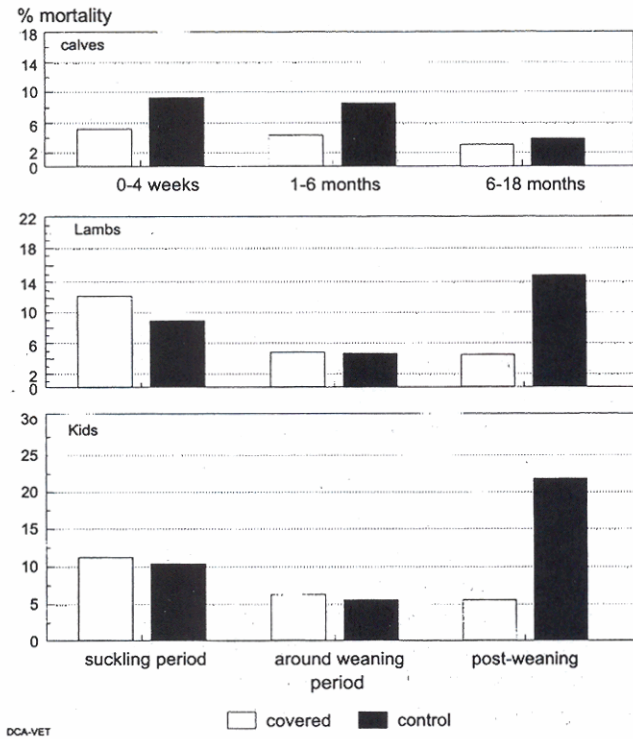


Figure 2. Mortality in first period of life in 3 pairs of districts in Afghanistan. Numbers of deaths/animals at risk in covered and (control) districts: calves 129/1088 (230/1098); lambs 795/3829 (1879/6580); kids 575/2555 (1786/4800)

### Kids

Mortality was more or less comparable to that in lambs; it started off almost equal in both groups of districts, with neither a significant difference in the suckling period ( $p = 0.27$ ), nor in the weaning period ( $p = 0.195$ ). In the post-weaning period, however, mortality rose spectacularly in the control group to four times that of the covered group ( $p < 0.01$ ).

### DISCUSSION

The results presented in this paper refine and confirm the results of an earlier reported impact study of a veterinary field programme in Afghanistan (Schreuder *et al.*, 1996b). In addition, the present study exposed clearly the lack of impact of this programme during certain seasons and for certain groups of young stock.



In winter, the impact of the programme in adult small ruminants was totally absent. Apparently, in this season, other mortality causes (e.g. poor housing and lack of proper feed) prevailed over those causes against which the animal health programme was directed. The veterinary programme consisted mainly of a preventive vaccination programme against major infectious diseases and the provision of antiparasitic drugs. Because infectious and parasitic diseases have always caused considerable losses to livestock in Afghanistan (FAO, 1955, 1973), it was earlier assumed that the preventive veterinary interventions had been responsible for most of the effect of the animal health programme (Schreuder *et al.*, 1996b). The results of the present study support this assumption, as the impact of the programme was greatest during the periods that animals are exposed to parasitic infestations and other infectious diseases. These periods are the spring, summer and autumn, when animals are generally grazing on communal grazing grounds.

In addition to the lack of impact during the winter period, there was a lack of impact during the suckling period, especially for small ruminants. A possible explanation could be the lack of hygiene around lambing (all taking place indoors), but also the widespread opposition to providing colostrum for new-born animals. There is little use in vaccinating pregnant ewes against clostridial diseases (including enterotoxaemia) if the newborn lamb is not given colostrum.

The issue of possible bias introduced by the farmers or enumerators or by clustering of data has been discussed (Schreuder *et al.*, 1996a). The striking seasonal variation in the impact of the programme and the way this variation can be explained by the components of the programme increased our confidence in the answers provided by the farmers.

In conclusion, while the differences in overall mortality between the covered and control districts demonstrated the benefits of a veterinary programme similar to the DCA-implemented one, the lack of visible impact in specific seasons and age groups stresses the need for further refinement of such programmes. Additional inputs like an extension programme concentrating on animal husbandry measures in the winter and the provision of colostrum to newborn animals are therefore required to cope with the losses in these periods.

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## REFERENCES

- FAO report to the Government of Afghanistan, 1955. The control of sheep diseases and parasites, (FAO report no. 336, D.A. MacPherson, FAO, Rome)
- FAO technical report, UNDP/SF project 210 (AFG/511), 1973. Final report of epizootiologist, (M.D. Blaga, Kabul)
- Schreuder, B.E.C., Moll, H.A.J., Noorman, N., Halimi, M., Kroese, A.H. and Wassink, G.A., 1996a. Benefit-cost analysis of veterinary interventions in Afghanistan based on a livestock mortality study. *Preventive Veterinary Medicine*, **26**, 303-314
- Schreuder, B.E.C., Noorman, N., Halimi, M. and Wassink, G., 1996b. Livestock mortality in Afghanistan in districts with and without a veterinary programme – preliminary report on an impact study. *Tropical Animal Health and Production*, **28**, 129-136

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### L'impact d'un programme vétérinaire en Afghanistan sur la mortalité saisonnière du bétail

**Résumé** – Cet article présente de nouvelles données grâce à une enquête de deux ans en Afghanistan, où la guerre pendant plus de dix ans a complètement désorganisé les services vétérinaires. L'étude basée sur un questionnaire montra que la mortalité annuelle, chez le bétail, les chèvres et les moutons, était substantiellement plus faible pour les régions ayant en place des services vétérinaires (régions surveillées) comparée aux régions sans support vétérinaire (régions de contrôle). L'impact du programme varie selon la saison et l'âge des animaux étudiés, le programme n'ayant pas d'impact positif en hiver et cela en particulier pour les petits ruminants adultes. L'impact le plus important fut observé au printemps et en automne pour les chèvres adultes et en été et en automne pour les moutons adultes. L'impact fut aussi réduit (voire même complètement absent pour les petits ruminants) pendant la période d'allaitement des jeunes. L'impact le plus important fut observé chez les petits ruminants après le sevrage avec 4 fois moins de morts chez les agneaux et les chevreaux dans les régions surveillées. Il fut conclu que l'impact le plus important de ce programme vétérinaire a été obtenu quand les animaux sont en contact avec d'autres troupeaux pendant la période du broutage, quand les parasites et les maladies infectieuses sont prévalentes et contre lequel le programme vétérinaire voulait se porter. Des bénéfices supplémentaires, comme les activités agricoles extensives, sont nécessaires pour améliorer l'effet de ce programme en hiver et dans la période pre-sevrage des jeunes animaux.

### Observaciones adicionales acerca del impacto de un programa veterinario sobre la mortalidad estacional del ganado en Afganistán.

**Resumen** – Este artículo describe los resultados de un estudio de 2 años de duración sobre la mortalidad del ganado. El estudio fue realizado en Afganistán, donde una guerra de más de diez años de duración ha alterado completamente el funcionamiento de los servicios veterinarios de campo. De acuerdo con un cuestionario diseñado para medir el impacto de dichos servicios, la mortalidad anual media del ganado vacuno, ovino y caprino fue sustancialmente inferior en los distritos con servicios veterinarios ("distritos cubiertos") que en los distritos sin servicios veterinarios ("distritos control"). El impacto del programa varió en función de la estación del año y de la edad de los animales. El programa no tuvo ningún impacto en invierno, particularmente en pequeños rumiantes adultos. El impacto más alto fue en primavera y otoño para el ganado caprino adulto, y en verano y otoño para el ovino adulto.

El impacto del programa fue también limitado (o incluso nulo en pequeños rumiantes) durante el período de lactancia en animales jóvenes. El impacto más alto fue en el período postdestete en pequeños rumiantes, de manera que en los distritos control la mortalidad de corderos y cabritos fue aproximadamente cuatro veces superior que en los distritos cubiertos.

Se concluyó que el mayor impacto del programa se obtuvo cuando los animales están en contacto con otros rebaños durante la estación de pastoreo, época en la que las enfermedades infecciosas y parasitarias controladas por el programa son muy comunes. En consecuencia, se requieren medidas adicionales – incluyendo actividades de extensión – para mejorar el impacto del programa en invierno y durante el período neonatal.