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HEALTH & PROTOCOLS
EXPORTS SOUTH AFRICA

African horse sickness control

General surveillance & testing 2019

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In partnership with
Western Cape Government

Introduction

In this report we evaluate the reporting of African horse sickness (AHS) across South Africa during 2019. We evaluate both negative and positive test results which had an impact on the risk-based system in place with regards to movement control of equids into and within the AHS controlled area. AHS movement control aims to limit the risk of introduction of the disease into the controlled area of South Africa. An active surveillance report is published annually which focusses on the sentinel surveillance program within the AHS free and surveillance zones of the controlled area[1]. AHS surveillance is however not limited to this active component. Passive surveillance is undertaken throughout the country since AHS is a controlled (and therefore notifiable) disease. Clinical investigations by veterinarians will often include testing for the virus, and, since the development of RNA-detection methods, primarily PCR, this has been the testing method of choice for clinicians.

The laboratories in South Africa that tested for AHS during 2019 were Onderstepoort Veterinary Research (OVR), the Equine Research Centre – Veterinary Genetics Laboratory (ERC), Stellenbosch Provincial Veterinary Laboratory (SPVL) and Deltamune[i]. In collaboration with the laboratories in South Africa with support from the Department of Agriculture, Forestry and Fisheries (now Department of Agriculture, Land Reform & Rural Development – DALRRD), the Western Cape Department of Agriculture and the South African Equine Veterinary Association (SAEVA), SAEHP have been provided with access to AHS case reports and testing results since September 2017 and have captured these in the Equine Cause of Disease (ECOD[ii]) system from September 2018, coinciding with the start of the 2018/2019 AHS season. This report evaluates available information for the 2019 calendar year.

Data considerations

While data captured on laboratory submission forms has improved over the last few years, there are times where results cannot be linked to a specific local municipality, which is the spatial resolution that is used for ECOD. For positive and suspect results this is solved through follow up with the person who submitted the sample– however it is not practically possible to also follow up all negative results. As an example: for pre-movement testing the sender is sometimes the responsible transporter and these negative results would take time to link back to a physical location. From our experience these situations occur infrequently and do not have a substantial effect on the outcomes published here.

The ECOD system allows for the capturing of suspect and positive clinical cases of disease based on laboratory results as well as cases where the clinician bases the diagnosis on clinical signs with an epidemiological link to a known positive case. Such cases will not have a positive laboratory result but are still considered AHS cases for movement purposes. While this report focusses on AHS laboratory testing, there were an additional 25 non-laboratory confirmed cases and an additional 10 non-laboratory confirmed suspect cases of AHS reported in 2019. The primary reason case data is captured is to enable risk-based movement protocols for horses moving into the AHS controlled

[i] Deltamune laboratory services was recently acquired by NOSA with a shift in focus to food security. Testing for AHS was suspended from August 2019, and will not be available for the foreseeable future.

[ii] www.myhorse.org.za/ecod

area. The most recent movement report is for the 2019 calendar year[2]. The reference to clinical cases in this report on surveillance refers to cases that were regarded as positive where laboratory testing was not done and does not indicate the presence or absence of clinical signs of AHS. One data set that is not available is the number of clinical investigations performed by clinicians where AHS was ruled out as a differential diagnosis.

While some sentinel surveillance evaluation is shown below (Figure 8 primarily), the data depicted here excludes this component simply because the sentinel program is reported on in detail each year. Unless explicitly mentioned therefore the information below excludes the sentinel surveillance program.

The data presented does not consider clustering at herd level – results are captured on lab-report basis, and while it can be assumed that all horses tested in a single lab report are associated with a single group it is not possible to confirm this in all cases without further investigation.

Finally, the case totals published here may differ from officially published totals by the South African Government, where the latter focus more on cases submitted officially through SR1 reports or monthly disease reporting processes. Case reporting for assessing the risk for movement control is likely to be more conservative with higher case numbers than reporting through official reporting systems.

Results

General results

Table 1 shows the overall summary of data presented in this report. A total of 2942 individual horse laboratory reports were captured, of which 79.8% were negative, 20% were positive and the remaining 0.2% were considered suspect.

Table 1: Summary of all available data regarding AHS diagnoses and categorised by laboratory or clinical-only cases with case status.

Diagnosis method	AHS status			Total tested
	Confirmed	Suspect	Negative	
Laboratory	588	6	2348	**2942**
Clinical	25	10	-	**35**
Total	**613**	**16**	**2348**	**2977**

Spatial and temporal depiction of AHS surveillance

To allow for areas and months to be compared this section only includes results from laboratory-based testing (N=2942) with the associated 588 confirmed AHS cases by laboratory testing (see Table 1).

Provincial and Municipal breakdown of testing and laboratory positives

Figure 1 shows the temporal spread of testing per province during the 2019 calendar year with the epidemic curve of laboratory confirmed AHS cases overlaid. The provincial breakdown of testing is also spatially shown in Figure 2. Gauteng tested the most horses (1483 tests; ~50% of the total) and in general most testing took place between March and May. The Western Cape tested the second greatest number of horses (760; ~26%) and most tests in the province took place in May. (*Figure 6 below indicates that May was the peak for movement based testing and this peak for the Western Cape would include horses moving from stop-over quarantine facilities located in the Province after completion of the step wise protocol for risk mitigation*)

Figure 3 further categorises the number of tests performed from each municipality where horses were tested. Mpumalanga had the majority of testing performed in the Mbombela Local Municipality. Over 95% of Mpumalanga's reason for testing was for diagnostic (disease) purposes, and that area had 13 of the 34 lab confirmed cases from the province (Figure 4 and Figure 5). The Western Cape tested more horses for movement than for diagnostic purposes (57.6%), and this is highlighted by the dominance of testing in the Beaufort West, Worcester and George regions, where stop-over quarantine facilities are also situated.

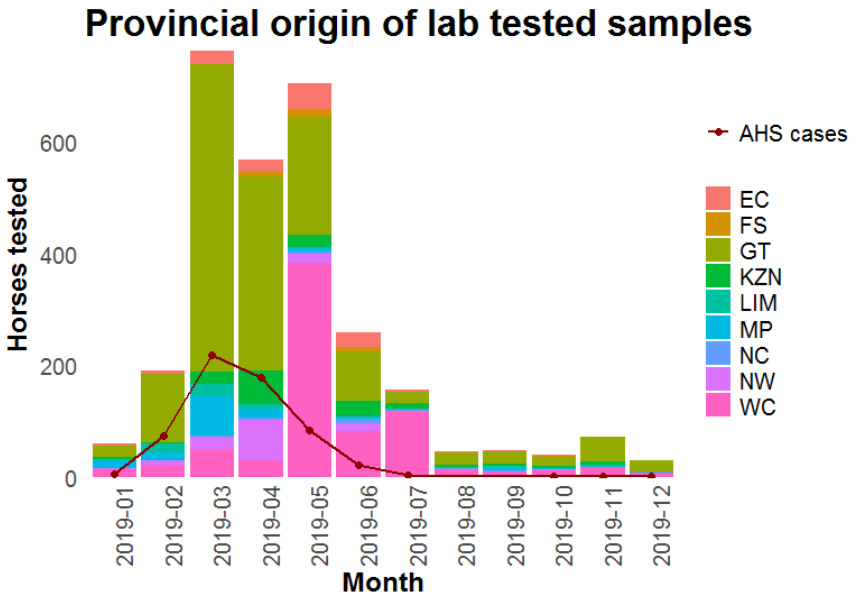

Figure 1: Breakdown of all laboratory testing performed by province and month of year. The positive laboratory diagnosed AHS cases overlays the bar plot. EC – Eastern Cape; FS – Free State; GT – Gauteng; KZN – Kwazulu Natal; LIM – Limpopo; MP – Mpumalanga; NC – Northern Cape; NW – North-West; WC – Western Cape

Horses tested at laboratories for African horse sickness
Clinical investigation and pre-movement
2019: Provincial breakdown

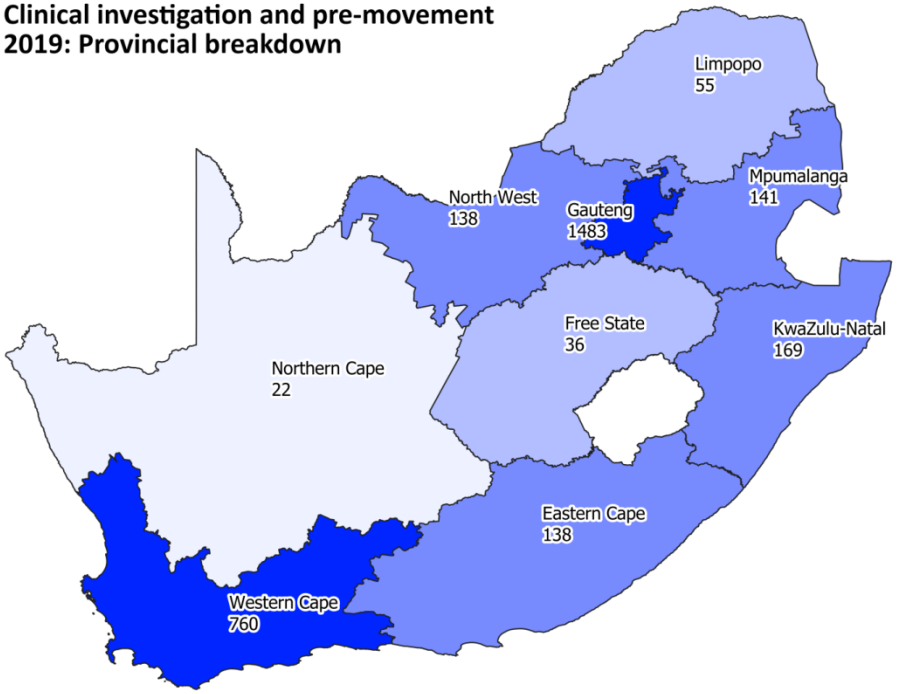

Figure 2

Horses tested at laboratories for African horse sickness
Clinical investigation and pre-movement
2019: Municipality breakdown

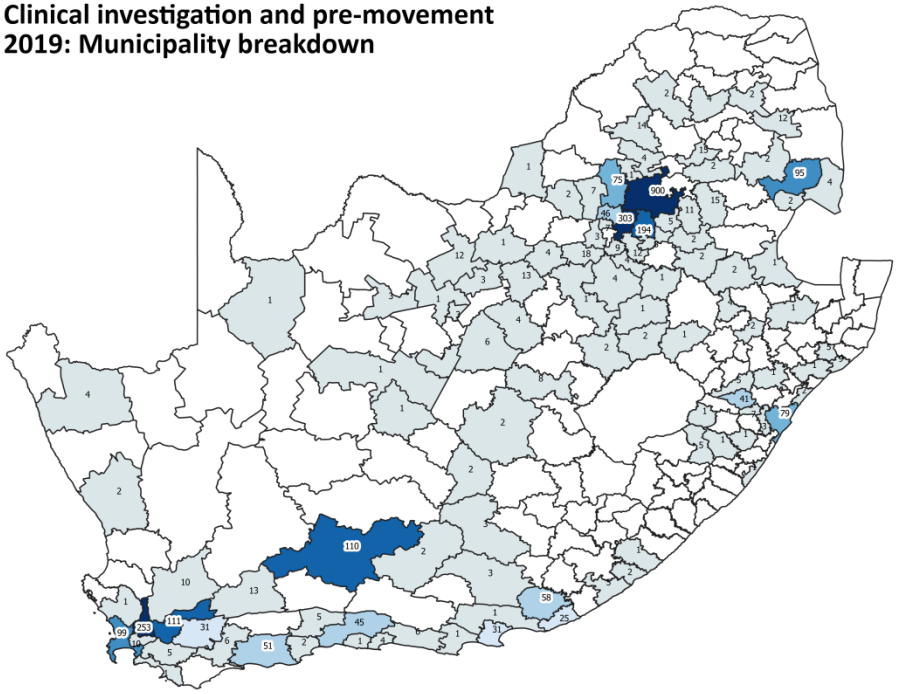

Figure 3

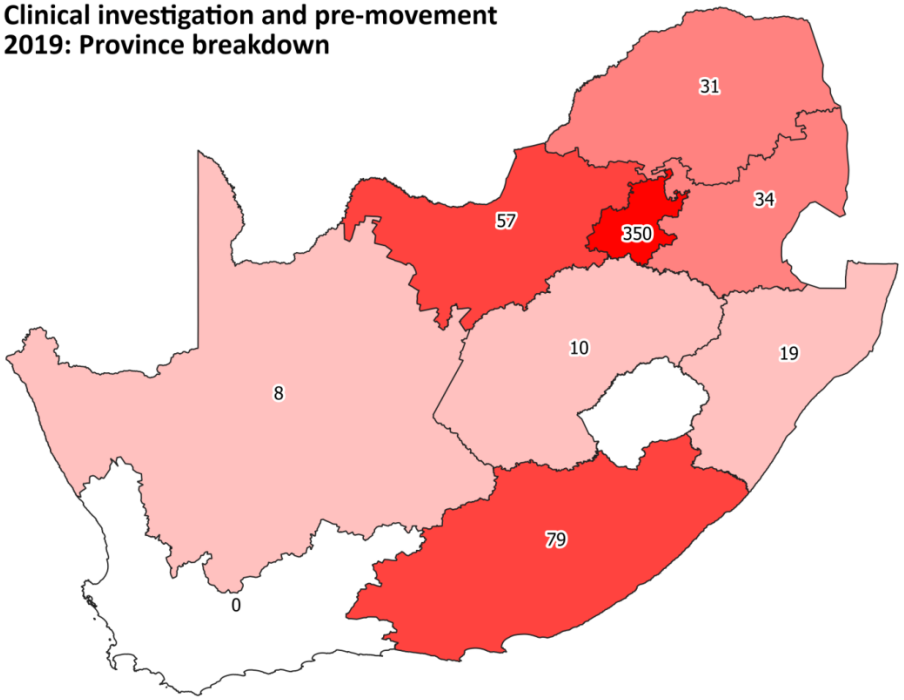

Figure 4

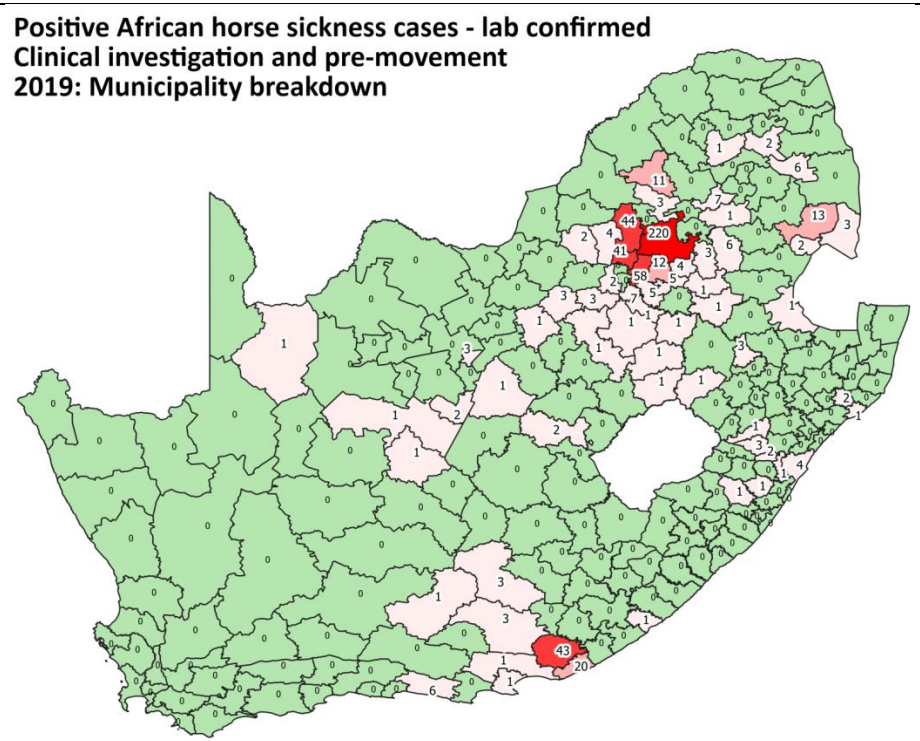

Figure 5

Positive AHS results for the year are shown in Figure 4 and Figure 5. Positive cases occurred in all provinces except for the Western Cape. Most cases occurred in Gauteng (350; ~60% with 63% of those in the City of Tshwane) with the remaining distributed primarily between Limpopo, North West, Mpumalanga and the Eastern Cape. The Eastern Cape cases predominantly occurred in the Makana and Ndlambe Local Municipalities.

Reason for testing and proportional laboratory involvement

There are three primary reasons for testing for AHS in South Africa – diagnosis of disease (clinical investigation), movement control and sentinel surveillance. Figure 6 below shows the former two reasons depicted over 2019 overlaid by the number of AHS confirmed cases. The majority of samples collected for clinical investigation were collected between March – May and as expected the majority of laboratory confirmed cases also occur during these three months. Most samples tested prior to movement were collected between April – June. As expected testing is limited from winter through to the end of the year when cases are minimal – this is due to the seasonal epidemiology of the disease in South Africa where cases are historically associated with the late summer and autumn periods of the year.

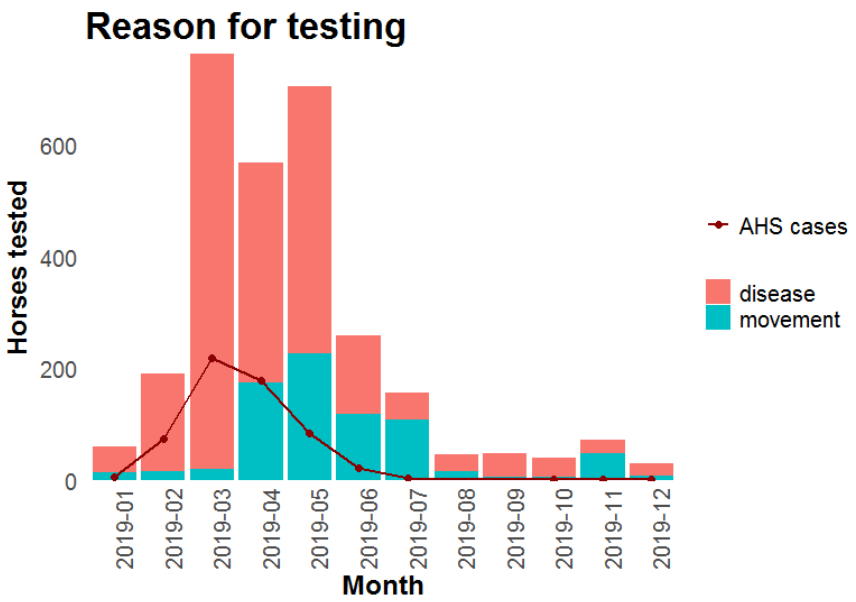

Figure 6: Breakdown of all laboratory testing performed by reason for testing and month of year.

Figure 7 illustrates the breakdown of testing performed at the different laboratories for diagnostic purposes or for movement control. The majority of AHS testing for diagnostic or movement purposes was performed at the ERC VGL. This excludes the monthly sentinel testing in the AHS surveillance zone where the same cohort of horses are tested from month to month and which approximately accounts for ~50% of the total number of tests performed. Figure 7 also illustrates the cessation of testing for AHS by Deltamune in July 2019. Figure 8 shows all testing reasons with proportions by laboratory – Deltamune was primarily testing for movement purposes, accounting for 52.8% of that testing. As expected, the ERC dominated the clinical investigation testing accounting

for ~94% of this testing in the country. Sentinel surveillance testing is performed exclusively at OVR (serology) and SPVL (PCR).

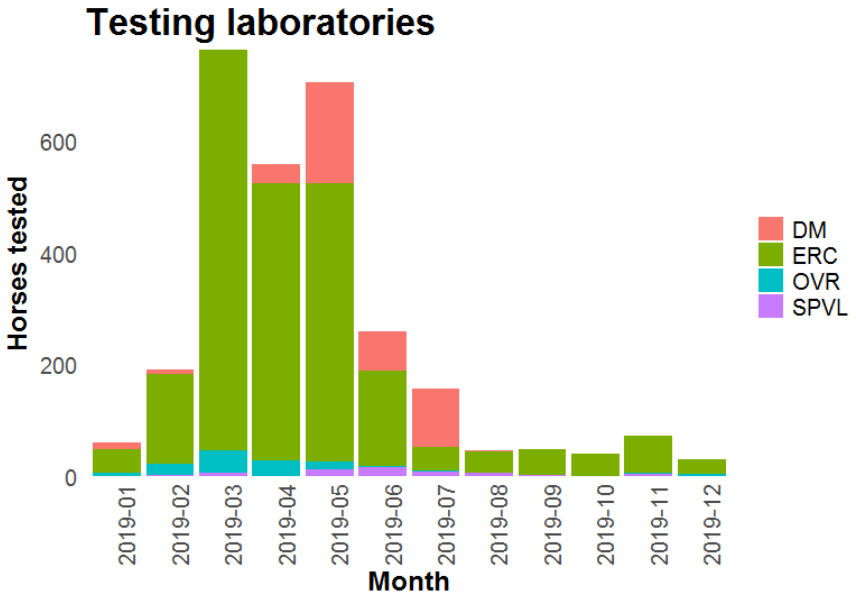

Figure 7: Breakdown of all laboratory testing performed by laboratory associated and month of year. DM – Deltamune; ERC – Equine Research Centre – Veterinary Genetics Lab; OVR – Onderstepoort Veterinary Research; SPVL – Stellenbosch Provincial Veterinary Laboratory

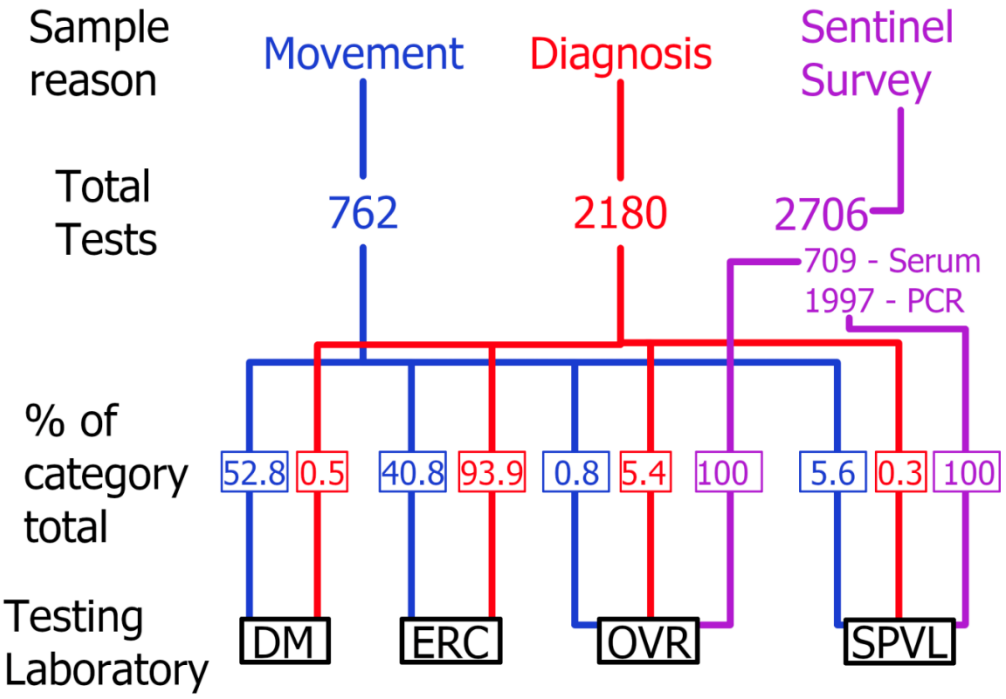

Figure 8: Reason for sampling breakdown by laboratory. NOTE: Sentinel surveillance samples are included here, and also in this category antibody and RNA-based testing are separated, with OVR testing the former and SPVL the latter. DM – Deltamune; ERC – Equine Research Centre – Veterinary Genetics Lab; OVR – Onderstepoort Veterinary Research; SPVL – Stellenbosch Provincial Veterinary Laboratory

Discussion and acknowledgements

This is the first consolidated report that includes both positive and negative AHS test results for testing performed over the entire country for a calendar year. The report establishes a testing baseline, an overview of the reasons for testing and a summary of the samples processed at the different laboratories with a breakdown of the results, all of which supports and refines a risk based approach to AHS control in the country. An objective understanding of why samples are collected, where samples are sent for processing and the number of positive and negative results over a calendar year will assist in future planning and provides clarity relating to some of the deficiencies highlighted in the 2013 EU FVO[3] report.

We are grateful for the continued support of the DALRRD and the Provincial Veterinary Services in allowing access to laboratory results from the respective laboratories. The laboratories mentioned in this report have kindly made their information available to the Boland State Veterinary Office, on whose behalf this analysis is performed by SAEHP. The ECOD system was developed for the South African Equine Veterinary Association to report on all equine diseases and syndromes in the country. SAEHP have maintained this system for the past 2 years and have adapted it to capture negative AHS testing with the primary purpose of refining risk-based control measures. In this regard we are grateful to SAEHP personnel who have captured much of the negative result and movement data.

References

1. Grewar JD, Weyer CT. *African horse sickness control: Sentinel surveillance report 2018/2019 season*. Available at http://jdata.co.za/myhorse/documents/infographics/Reports/2018 2019 Sentinel Surveillance.pdf

2. Grewar JD, Weyer CT. *African Horse Sickness Control: Movement Report 2019*. Available at http://jdata.co.za/myhorse/documents/infographics/Reports/2019 Movements report.pdf

3. European Commission 2013. *Final Report of an Audit Carried out in South Africa from 20 to 29 May 2013 in Order to Evaluate the Animal Health Controls in Place in Relation to Export of Equidae to the EU, with Particular Reference to African Horse Sickness*. Available at https://ec.europa.eu/food/audits-analysis/act_getPDF.cfm?PDF_ID=10679