SA EQUINE
HEALTH & PROTOCOLS
EXPORTS SOUTH AFRICA

# African horse sickness control

## Surveillance report

### General AHS surveillance and testing 2020

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2020

# Introduction

In this report we evaluate the reporting of African horse sickness (AHS) across South Africa during 2020. 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. The most recent report related to 2020 is the 2019/2020 AHS surveillance season report available here. 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 2020 were Onderstepoort Veterinary Research (OVR), the Equine Research Centre – Veterinary Genetics Laboratory (ERC) and Stellenbosch Provincial Veterinary Laboratory (SPVL). In collaboration with the laboratories in South Africa, with support from the 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[i]) system from September 2018, coinciding with the start of the 2018/2019 AHS season. This report evaluates available information for the 2020 calendar year.

## Data considerations

General data considerations have been discussed in a prior report and relate to the ability to follow up on all negative results. While this report focusses on laboratory associated results, it is important to note that clinically diagnosed cases of AHS (with no laboratory result), with an epidemiologic link to a confirmed AHS case, are considered cases that prevent movement of horses from the area concerned. In 2020 there were 9 confirmed clinical cases of AHS with a further 7 suspect cases in this regard. 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 AHS season. 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 differ slightly from officially published totals by the South African Government, where the latter focus more on cases submitted officially through SR1 reports

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

or monthly disease reporting processes. In 2020 the DALRRD reported 241 cases of AHS[ii], 90% (see Table 1) of the total reported here and 93% of the laboratory confirmed total reported here.

# Results

## General results

Table 1 shows the overall summary of data presented in this report. A total of 1672 (2942 in 2019) individual horse laboratory reports were captured, of which 84.3% (79% in 2019) were negative, 17.9 (20% in 2019) were positive and the remaining 0.2% (same as 2019) 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 | 259 | 3 | 1410 | **1672** |
| Clinical | 9 | 7 | NA | **16** |
| **Total** | **268** | **10** | **1410** | **1688** |

## 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=1672) with the associated 259 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 2020 calendar year with a comparison to 2019 to provide some insight into the impact of COVID-19 movement restrictions in South Africa. The epidemic curve of laboratory confirmed AHS cases is overlaid. The provincial breakdown of testing is spatially shown in Figure 2. Gauteng tested the most horses (918 tests; ~55% of the total, slightly up from the 50% of 2019) and in general most testing took place Feb and March, with the COVID restrictions changing the patterns seen the previous year. For Gauteng ~40% of all laboratory testing was related to movement – within country or for export (or both). The Free State tested most animals for movement purposes (63%) – a pattern also seen in the Western Cape. That province tested the second greatest number of horses (339; ~20%), with 53% for movement or export. Otherwise, the other Provinces followed the Gauteng trend where most testing was for diagnostic purposes, even Kwa-Zulu Natal which, along with Gauteng, is the source of most horses moving into the AHS controlled area in South Africa.

Figure 3 further categorises the number of tests performed from each municipality where horses were tested.

[ii] http://webapps.daff.gov.za/VetWeb/dieaseDatabase.do

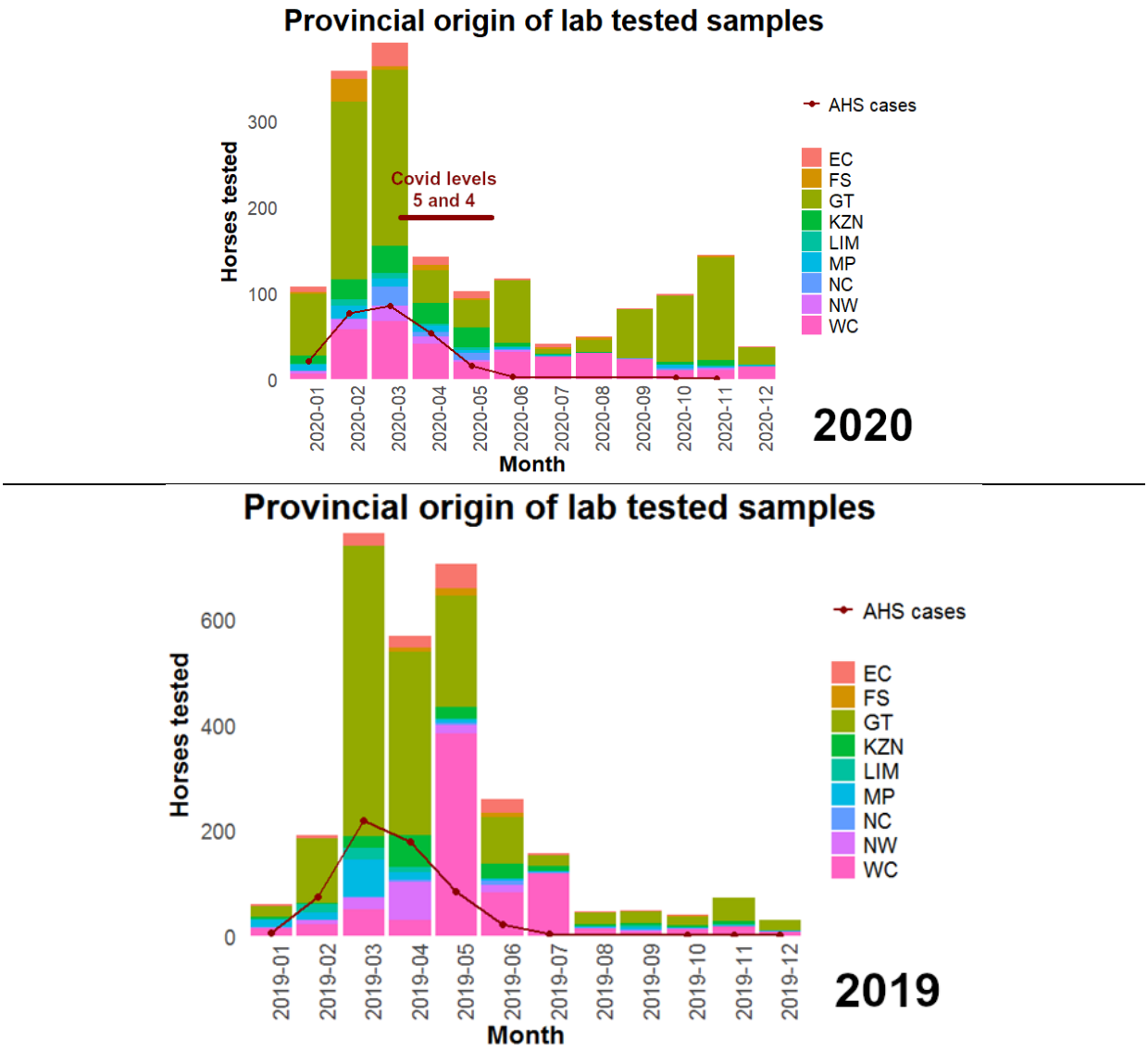


**Figure 1: Breakdown of all laboratory testing performed by province and month of year of both 2019 and 2020 (the latter the year reported on). The positive laboratory diagnosed AHS cases overlays the bar plot. EC – Eastern Cape; FS – Free State; GT – Gauteng; KZN – KwaZulu Natal; LIM – Limpopo; MP – Mpumalanga; NC – Northern Cape; NW – North-West; WC – Western Cape**

**Horses tested at laboratories for African horse sickness**
**Clinical investigation and pre-movement/export**
**2020: Provincial breakdown**

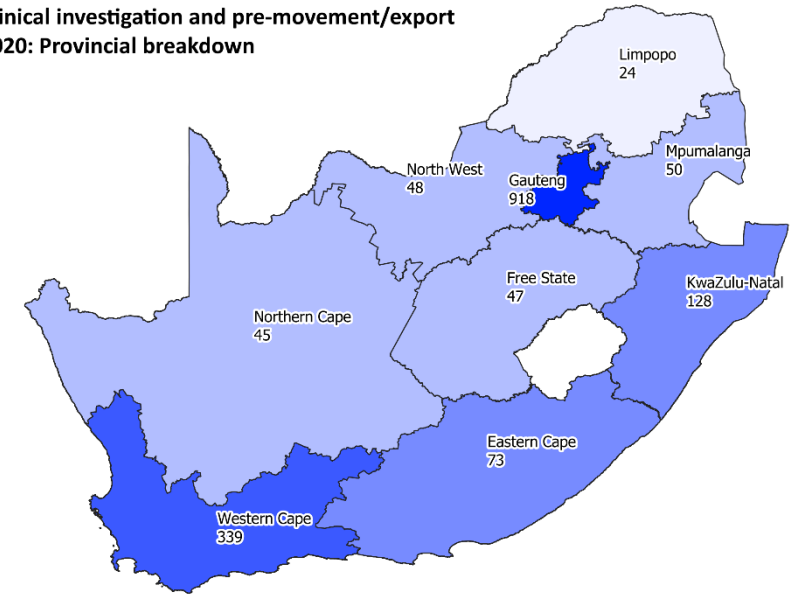


Figure 2

**Horses tested at laboratories for African horse sickness**
**Clinical investigation and pre-movement/export**
**2020: Municipality breakdown**

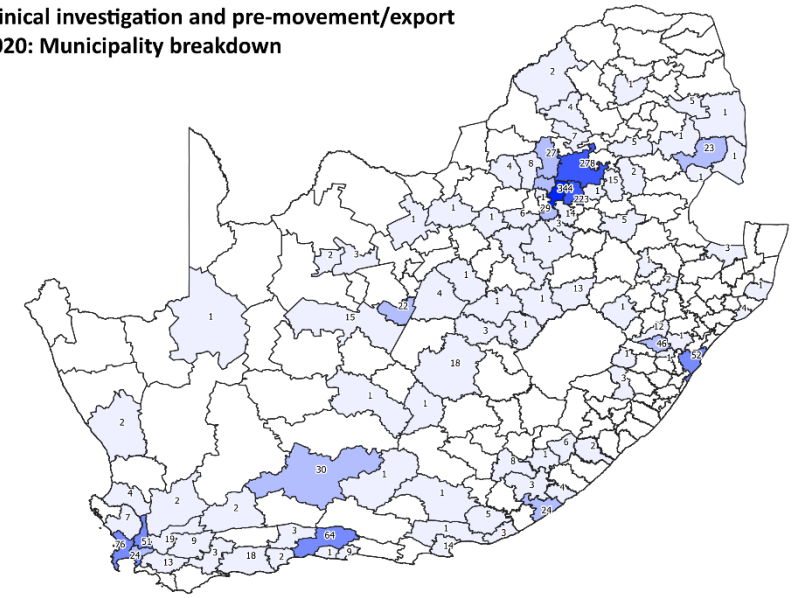

Figure 3

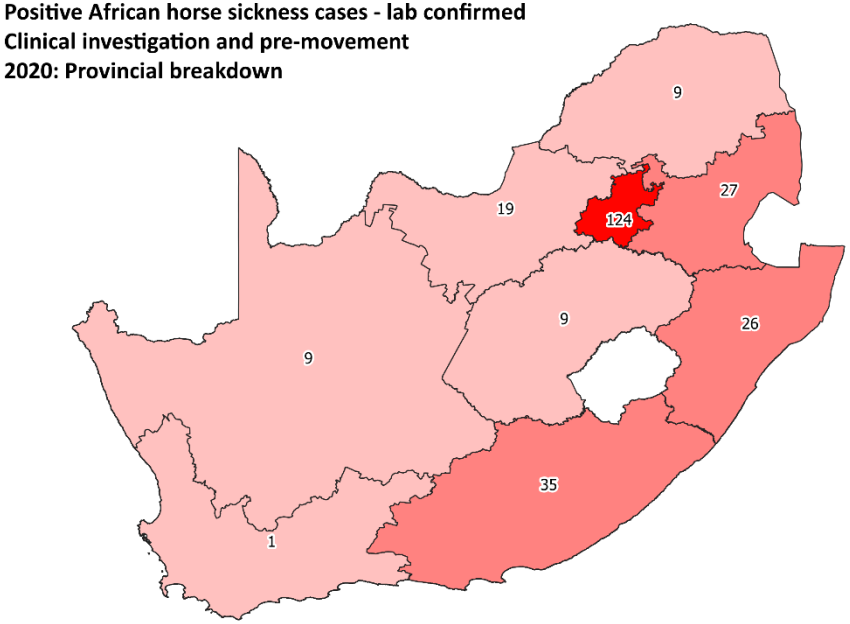


Figure 4

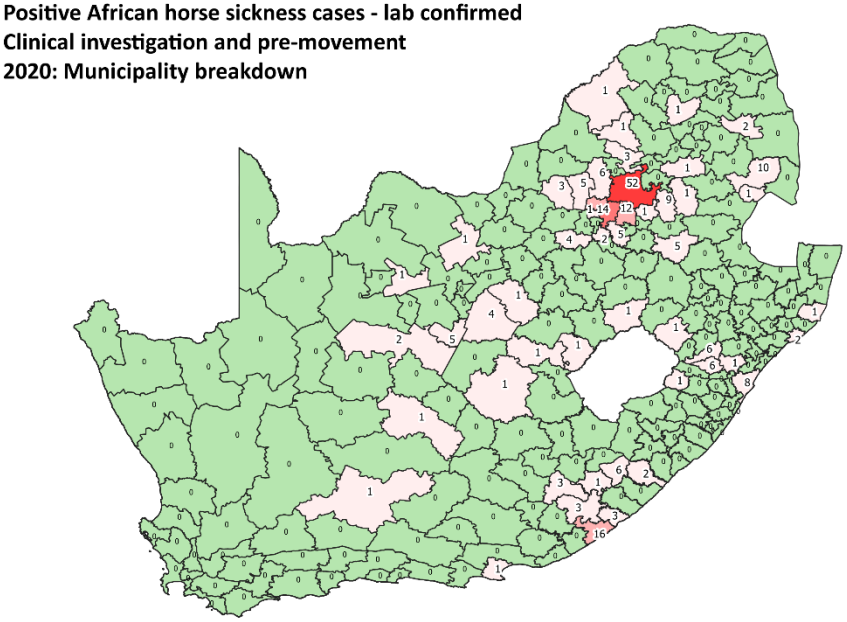


Figure 5

Positive AHS results for the year are shown in Figure 4 and Figure 5. Positive cases occurred in all provinces including one in the Western Cape. Most cases occurred in Gauteng (124; ~47% of the total with 42% of those in the City of Tshwane – the most cases in a single municipality for the year). The rest were distributed mainly in the eastern and south-eastern provinces, namely Mpumalanga, KwaZulu Natal and Eastern Cape. A change from 2019 was a decrease in proportion of cases associated with the North West Province.

## 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 (including pre-export testing) and sentinel surveillance. Figure 6 below shows the former two reasons depicted over 2020 overlaid by the number of AHS confirmed cases. Samples collected for diagnostic purposes were heavily impacted by COVID-19 movement restrictions in April and May. This sampling occurs primarily in the summer and autumn months. 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.

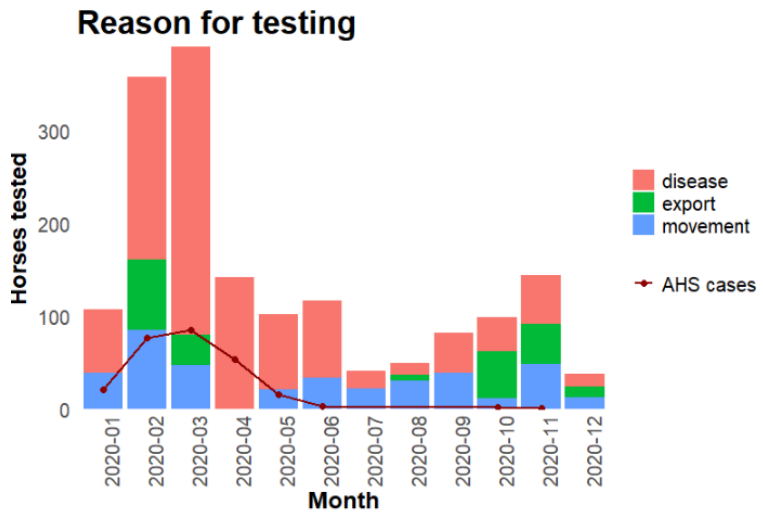


Figure 6: Breakdown of all laboratory testing performed by reason for testing and month of year.

Figure 7 illustrates the breakdown of testing performed at the different laboratories for diagnostic purposes or for movement control. Most 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 ~65% of the total number of tests performed – an increase from 50% in 2019. Figure 8 shows all testing reasons with proportions by laboratory.

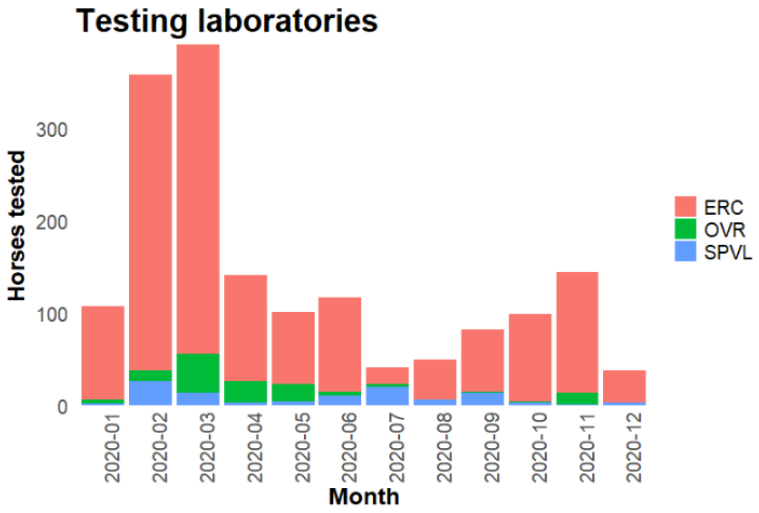


Figure 7: Breakdown of all laboratory testing performed by laboratory associated and month of year. ERC – Equine Research Centre – Veterinary Genetics Lab; OVR – Onderstepoort Veterinary Research; SPVL – Stellenbosch Provincial Veterinary Laboratory

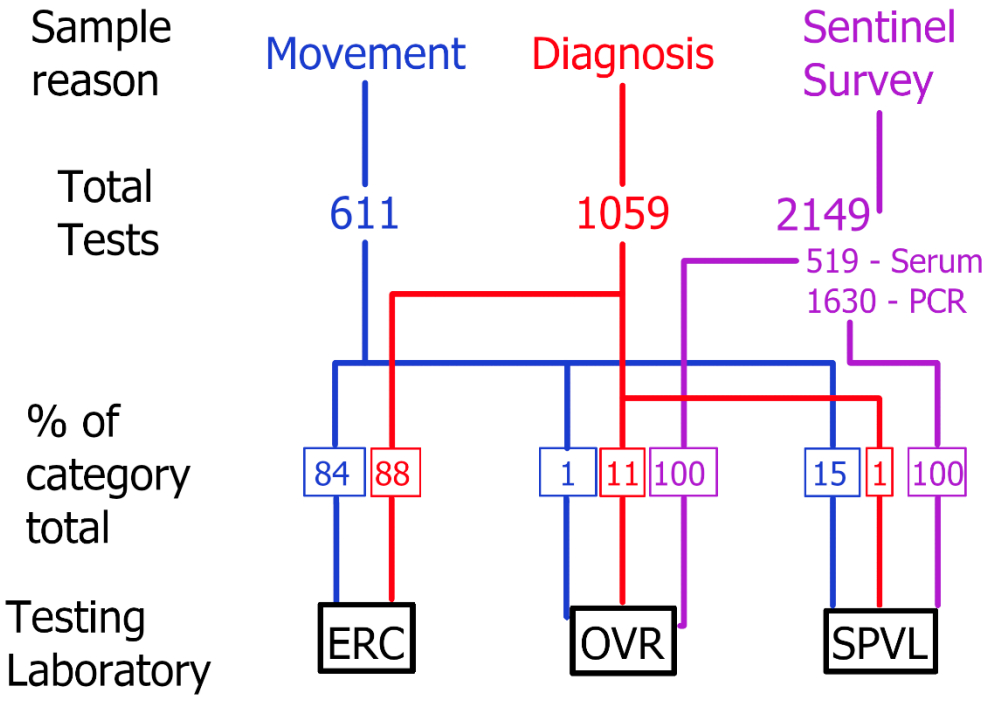


Figure 8: Reason for sampling breakdown by laboratory. NOTE: Sentinel surveillance samples are included here, and in this category antibody and RNA-based testing are separated, with OVR testing the former and SPVL the latter. ERC – Equine Research Centre – Veterinary Genetics Lab; OVR – Onderstepoort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

## Discussion and acknowledgements

This is the second 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 example of this has been published where the 2019 data was primarily used[1] – and these data are important in understanding disease risk within 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[2] 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 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, Kotze JL, Parker BJ, van Helden LS, Weyer CT. An entry risk assessment of African horse sickness virus into the controlled area of South Africa through the legal movement of equids. Simuunza MC, ed. *PLoS One*. 2021;16(5):e0252117. doi:10.1371/journal.pone.0252117

2. EC. *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*.; 2013.