SA EQUINE
HEALTH & PROTOCOLS
EXPORTS SOUTH AFRICA

African horse sickness control

Surveillance report

Sentinel Surveillance 2025

JD Grewar, CT Weyer & LS van Helden
2025

Western Cape Government
FOR YOU

Overview

The African horse sickness (AHS) sentinel surveillance programme provides additional assurance of AHS freedom within South Africa's AHS Free Zone (FZ) and Surveillance Zone (SZ). Since 2023, the programme has relied exclusively on PCR-based testing to detect the presence of AHS viral RNA in recruited sentinel horses. The PCR sampling framework is designed to detect AHS at a minimum expected prevalence of approximately 2%, with a 95% confidence level. This corresponds to a target of 150 animals sampled per month. Sentinel recruitment is independent of vaccination status, except where recent AHS vaccination may result in transient PCR positivity at initial testing.

During 2025, viral RNA PCR testing was conducted at the University of Pretoria / Equine Research Centre Molecular Diagnostics Laboratory. The assay used was a University of Pretoria–developed, World Organisation for Animal Health (WOAH)-validated real-time RT-PCR, as described by Guthrie et al. (2013).

A detailed description of the original surveillance programme is provided in the January 2016 Western Cape Epidemiology Report. All subsequent surveillance reports are available at www.myhorse.org.za.

> **This report covers the AHS sentinel program for the 2025 calendar year. The results confirm that it is unlikely that AHS was circulating in the AHS free and surveillance zone during this period.**

General overview of sampling and results

1730 (up from 1588 in 2024) PCR sentinel samples were analysed from 58 (59 in 2024) different farms at an average of 144 samples from, on average, 43 different farms per month. All samples tested negative.

Investigations

There were no follow-up investigations arising from confirmed positive AHS laboratory results during the reporting period. One precautionary investigation was undertaken in April 2025 following low-level, suspect real-time RT-PCR results detected in two sentinel samples during routine monthly testing. Repeat laboratory testing and on-farm follow-up sampling of all sentinel horses on the affected holdings were conducted, with no clinical abnormalities observed and no evidence of AHS infection identified. The investigation findings were considered most consistent with laboratory contamination rather than true infection. No additional investigations were required during the year.

Spatial considerations

The sentinel surveillance program is based on a proportional sampling system with most sentinels in areas of the surveillance area that have the highest population of horses. Figure 1 and Figure 2 show the underlying population and current sentinel farms and the monthly average distribution of sentinels in the PCR sentinel program.

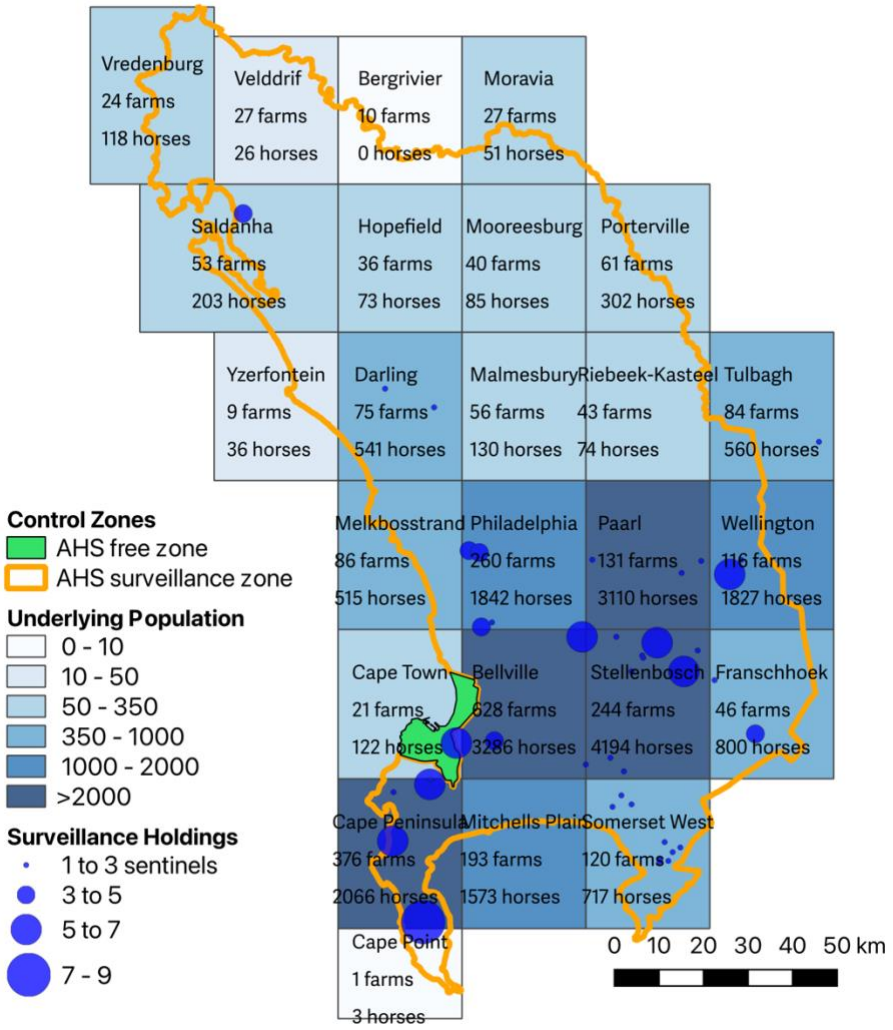

Figure 1: The underlying population of horses in the Surveillance and Free Zones of South Africa. These populations have been revised based on new population data collected between 1 April 2016 and December 2025.

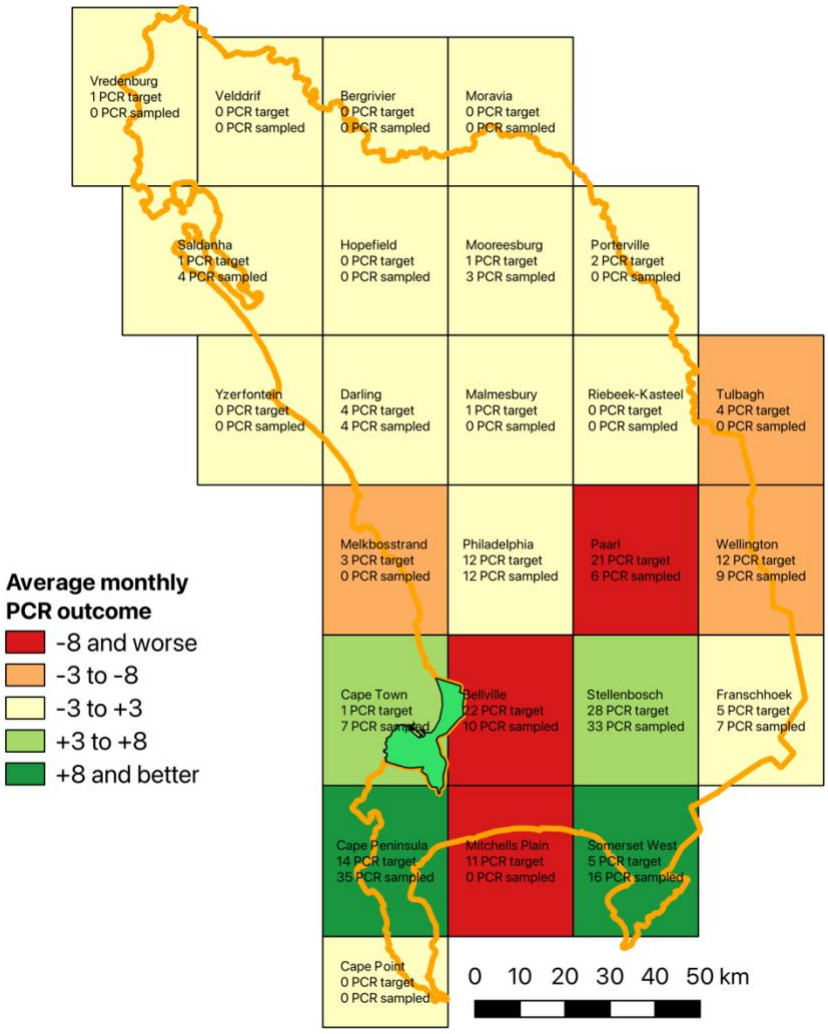

Figure 2: A map showing the AHS surveillance and free zone where PCR-sentinel surveillance has taken place during 2024. The map depicts the various areas with their target PCR samples to detect a 2% minimum expected prevalence using a proportional sampling frame. The red and orange areas are areas where PCR-sentinels were lacking on average while the light green to green areas show where surplus PCR-sentinels were sampled. Cream areas depict where the target was generally attained.

Surveillance system evaluation

The surveillance program is designed to detect AHS in the AHS surveillance zone at a minimum expected prevalence of 2% (MEP). In this section of the report, we establish the monthly sensitivity of the surveillance program at this expected prevalence level.

Parameters used in this evaluation are shown in Table 1 and analysis is based on evaluating sensitivity of surveillance programs (Martin et al. 2007). The historical surveillance outcome is considered as it provides information that aids in determining an accurate final probability of freedom as of December 2025. The final probability of freedom from Sept 2016 through December 2025 (112 months) was 89.5%, up 1.5 percentage points the previous year-end (see Figure 3).

The sensitivity of the sentinel surveillance improved in 2025 and the resulting probability of freedom increasing slightly is a consequence of this. This is the ninth AHS season running where cases of the disease have not been detected in the AHS surveillance and free area, although an outbreak of AHS occurred in the AHS protection zone in 2021.

Parameter	Value	Comments
$pIntro$	0.03	During periods where not outbreaks in the AHS controlled area are present. Based on historical outbreaks in the region.
	0.3	During periods where outbreaks are present in the AHS controlled area – estimate made increasing probability of introduction 10X the normal rate
Population at risk – total herds	1586	Data captured between 1 April 2016 and Dec 2025 for the AHS surveillance and free zones.
Sentinel farm populations	Various	Based on herd size as of Dec 2025 . The assumption is made that herd size would not change substantially on the sentinel properties over the period reviewed.
Sentinels tested per herd per surveillance period	Various	Actual tested data
Unit design prevalence (P_A^*)	0.02	Design prevalence at animal level
Herd design prevalence (P_H^*)	0.02	Design prevalence at herd level based on prior outbreaks (median value taken) in the controlled area assuming a herd PAR of the zones affected by each outbreak.
Test sensitivity	0.978	As published (Guthrie et al. 2013). Note that while serology was taken into consideration, for this analysis all horses that were tested on serology were tested on PCR – hence the use of a single test sensitivity across the analysis
Initial Prior confidence of Freedom	0.5	September 2016

Table 1: Parameters used to establish sentinel system probability and sensitivity of freedom for African horse sickness

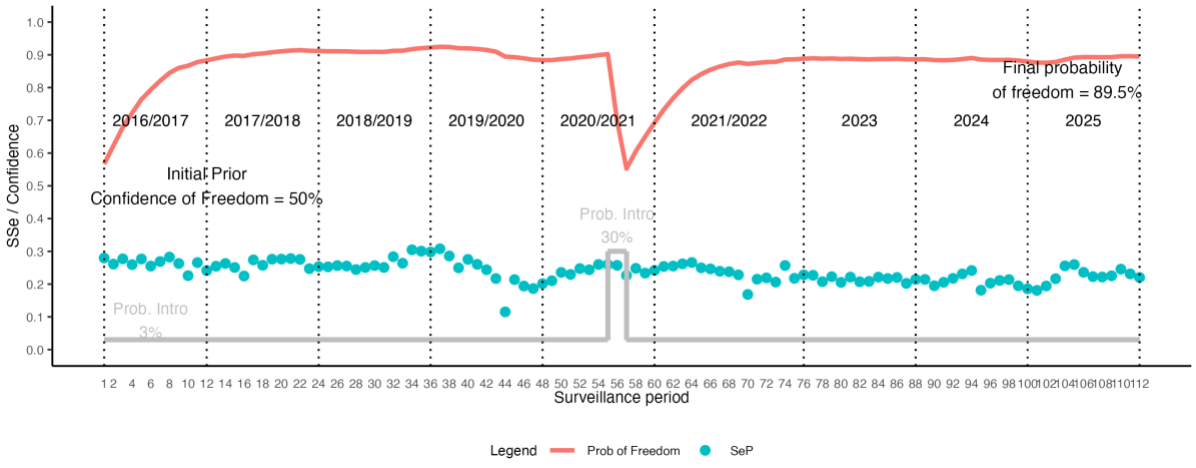

Figure 3: The sentinel surveillance sensitivity of individual surveillance periods (SeP - dots) with probability of freedom curve (red line) for the past seven surveillance seasons: the season currently reviewed is the 2025 calendar year. Probability of AHS introduction of 3% is set for periods where no AHS outbreaks are present in the AHS controlled area (grey line at 0.03 on y-axis) but at 10X that rate for where outbreaks are present as in April and May 2021 in the Cederberg AHS Protection zone.

Discussion and Conclusion

The primary objective of demonstrating African horse sickness (AHS) freedom in 2025 was achieved. A nine-year review of sentinel surveillance results indicates that, at both an animal-level and herd-level design prevalence of 2%, the programme achieved an estimated 89.5% probability of freedom from AHS within the AHS Surveillance and Free Zones. This level of confidence was attained despite the occurrence of an AHS outbreak approximately 88 km from the boundary of the Surveillance Zone in 2021. Notably, this estimate does not incorporate the contribution of passive surveillance, which would be expected to further increase confidence of freedom. Spatial representativeness remains a recognised limitation of the programme; however, targeted recruitment of additional sentinel horses in Stellenbosch during 2025 yielded measurable improvements, while the Paarl, Bellville, and Mitchells Plain areas remain slightly underrepresented.

References and acknowledgements

This program would not be possible without the support of the horse owners in the AHS surveillance zone who freely give of their time and resources to allow and facilitate the monthly sampling of horses. We are grateful to the University of Pretoria Molecular Genetics Laboratory who performed the testing of samples this season.

In this season the sentinel program was again achieved through collaboration between the Western Cape Department of Agriculture (Veterinary Services) and SAEHP. In this regard we specifically acknowledge Dr Tasneem Anthony. The WCDOA also currently fund the testing costs associated with the program. We are grateful to the SAEHP team who are directly involved with the program: Esthea Russouw and Lizel Germishuys.

Software and systems references

Evan Sergeant (2016). RSurveillance: Design and Analysis of Disease Surveillance Activities. R package version 0.2.0

H. Wickham (2009). ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York.

Hadley Wickham (2011). The Split-Apply-Combine Strategy for Data Analysis. Journal of Statistical Software, 40(1), 1-29.

Hadley Wickham (2016). scales: Scale Functions for Visualization. R package version 0.4.0.

Achim Zeileis and Gabor Grothendieck (2005). zoo: S3 Infrastructure for Regular and Irregular Time Series. Journal of Statistical Software, 14(6), 1-27

Joe Conway, Dirk Eddelbuettel, Tomoaki Nishiyama, Sameer Kumar Prayaga and Neil Tiffin (2016). RPostgreSQL: R interface to the PostgreSQL database system. R package version 0.4-1.

Literature references

Guthrie, A.J. et al., 2013. Diagnostic accuracy of a duplex real-time reverse transcription quantitative PCR assay for detection of African horse sickness virus. Journal of Virological Methods, 189(1), pp.30–35.

Martin, P.A.J., Cameron, A.R. & Greiner, M., 2007. Demonstrating freedom from disease using multiple complex data sources. 1: A new methodology based on scenario trees. Preventive Veterinary Medicine, 79(2–4), pp.71–97