Surveillance of Transmissible Spongiform Encephalopathy in Great Britain

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Background

Transmissible Spongiform Encephalopathy (TSE) is a neurodegenerative zoonotic disease, with BSE occurring in Bovine species. It is transmissible by the infection of prions (Classical) or is sporadically occurring and non-contagious (Atypical). The first case of BSE in Great Britain (GB) was confirmed in 1986, whilst the first epidemiologically linked case relating to contaminated feed was confirmed in 1988. To control the outbreak several regulations were implemented including the 'Ruminant Feed Ban' introduced in July 1988, which predicted a five-year lag for animals to be clear from Classical BSE. The 'Re-Enforced Feed Ban' was later introduced in August 1996, which banned all mammalian meat and bone meal. A total of 181,138 BSE cases have been confirmed since 1986 in GB; 179,183 from Passive Surveillance and 1,955 from Active Surveillance (*Figure 1*).

TSE Surveillance in Great Britain

Reasons for Surveillance
Surveillance was introduced to comply with EU Laws (EC999/2001), now UK regulations. It also provides a World Organisation for Animal Health (WOAH) BSE-Risk status, where GB are currently considered a 'Controlled Risk'. This is necessary to control the disease, reducing impact of infected tissues being passed into the food chain and improving confidence in GB Beef Trade.

Types of Surveillance for Cattle
Passive – This requires any animals displaying clinical signs suspicious of BSE or Scrapie to be reported to APHA for investigation (Introduced in 1986 for Cattle and 1993 for Sheep and Goats).
Active – This requires testing for all Fallen Stock aged over 48 months and a small group of animals from abattoirs, such as emergency slaughter (Introduced in 2001 for Cattle and 2002 for Sheep and Goats).

Impact of Surveillance
Surveillance methods paired with additional UK regulations have successfully controlled the BSE epidemic and provided a 'Controlled Risk' status. This resulted in the decline of all BSE cases, with the last reported case of Classical BSE in 2009.
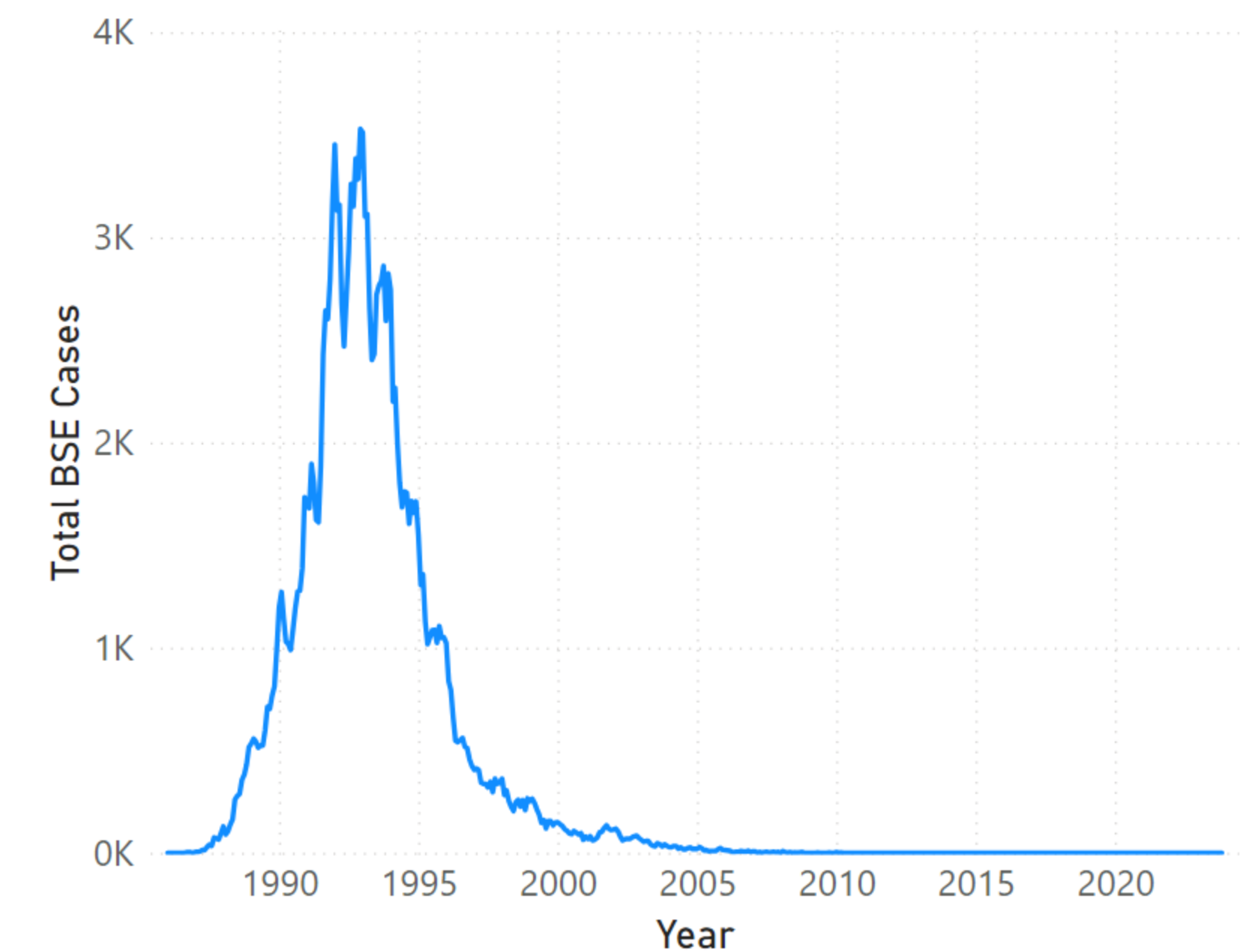

Figure 1 – Total BSE Positive cases recorded in GB

TSE Surveillance Data Capture

Surveillance Data Capture and Reporting
- APHA and DEFRA co-ordinate and collect surveillance submissions and test results, which are collated in the TSE surveillance System (TSESS) database.
- A dedicated Hotline provides advice and traceability checks relating to suspected BSE and TSE cases (including Exotic Animals).
- Databases incorporate routine data quality checks against animal ID's and holdings details, using the Cattle Tracing System to investigate discrepancies and ensure traceability.
- Submission data is routinely monitored to report new cases, restrictions, submissions and trends.
- Reports are publicly published on the GOV.UK website, alongside additional data provided by Northern Ireland.
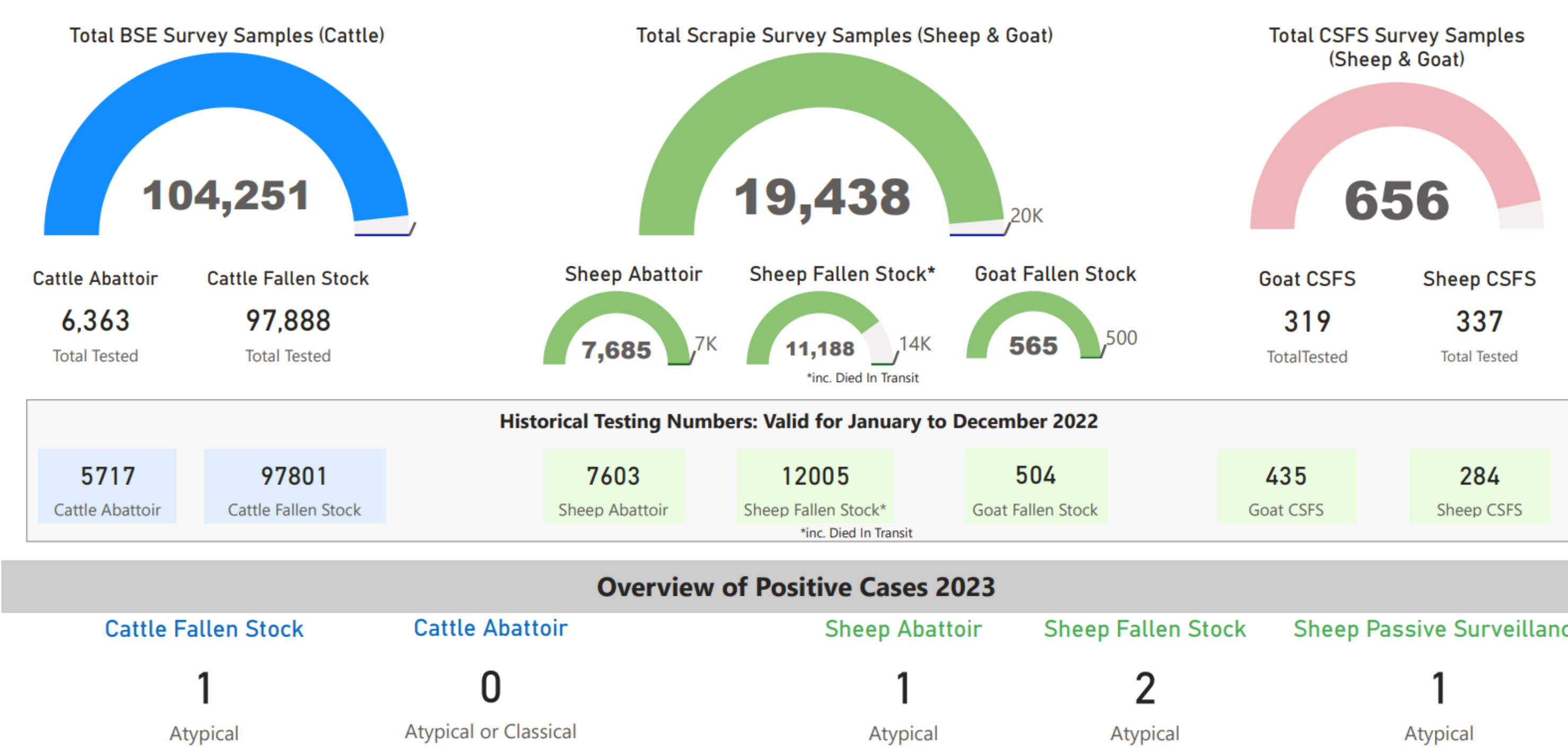
TSE Surveillance Dashboard Reporting

Figure 2 - Current testing numbers and outcomes for 2023 on a gauge against projected or required figures. Progress analysis through direct comparison of historic figures for the same period.
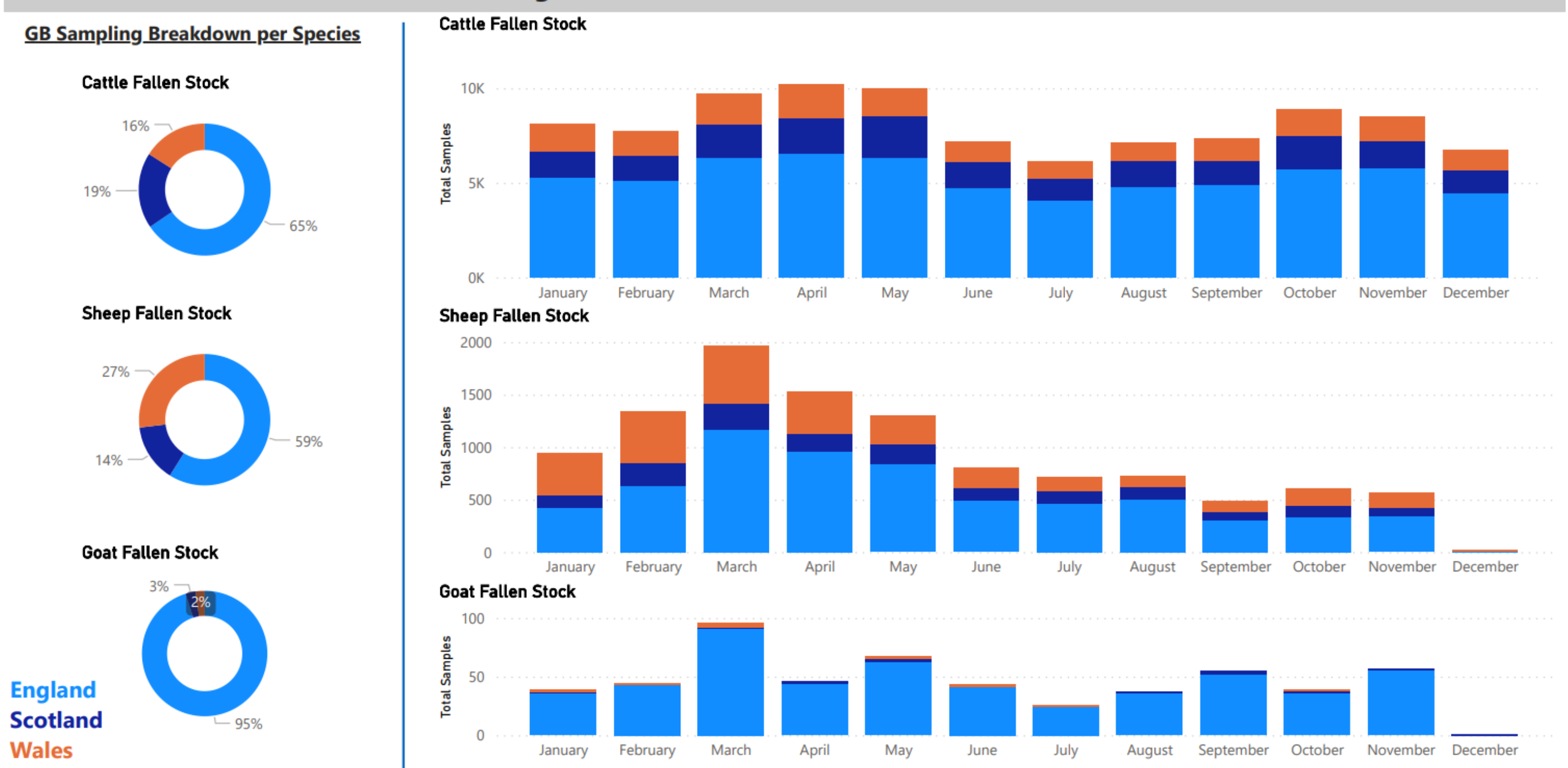

Figure 3 – Monthly distribution of testing numbers by survey per country.

TSE Surveillance System Dashboard
- Designed in PowerBI using data extracted from TSESS, it is distributed internally within APHA.
- It provides an insight into temporal and spatial trends for sampling and testing statistics including:
  - Distribution of sampling, testing and positive cases.
  - Performance of Sampling Sites through analysis of the total submissions and sample condition.
  - Submission discrepancy statistics when compared to the Cattle Tracing System.
- The dashboard can highlight limitations of GB Surveillance data, for example the disproportionate number of holdings for each Survey across GB (*Figure 3*). This leads to an imbalance for research purposes, however is managed through well documented processes and in-depth knowledge of the system.

References

APHA (2024a) *Transmissible Spongiform Encephalopathy Surveillance System (TSESS).* Database.
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