

GF-TADs Foot and Mouth Disease Risk Assessment Training Workshop

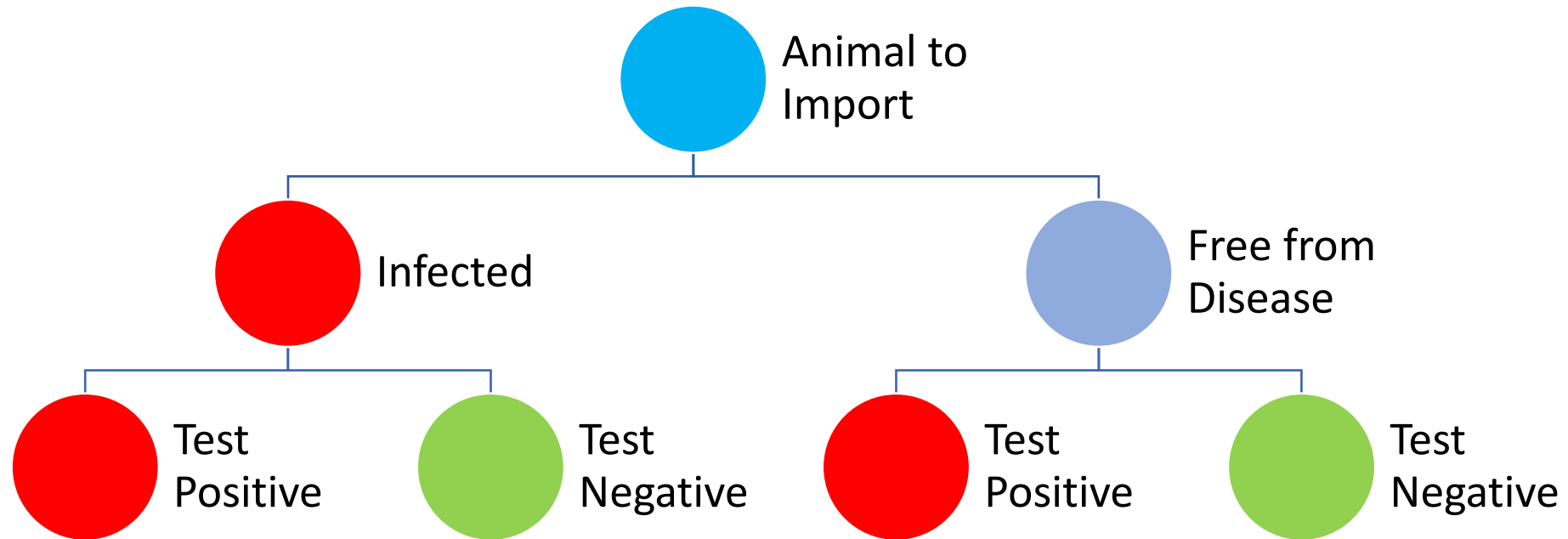
19 - 21 September 2023 Johannesburg, South Africa



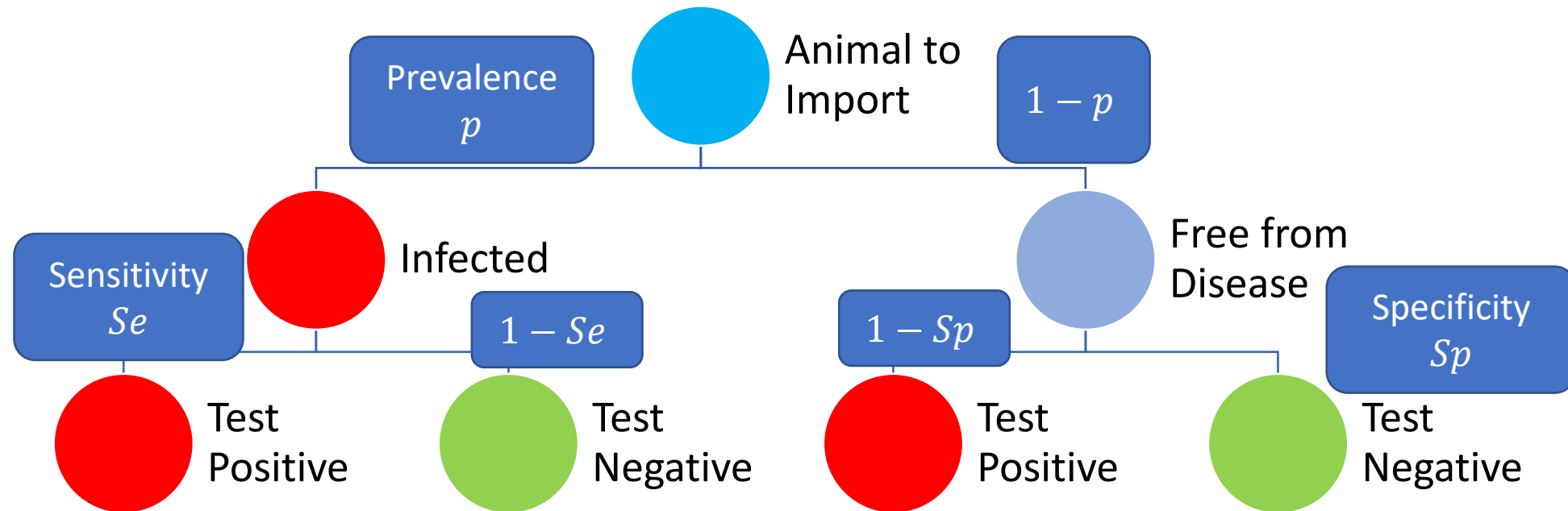
Quantitative Risk Assessment

Deterministic Risk Assessment

Scenario tree - IRA

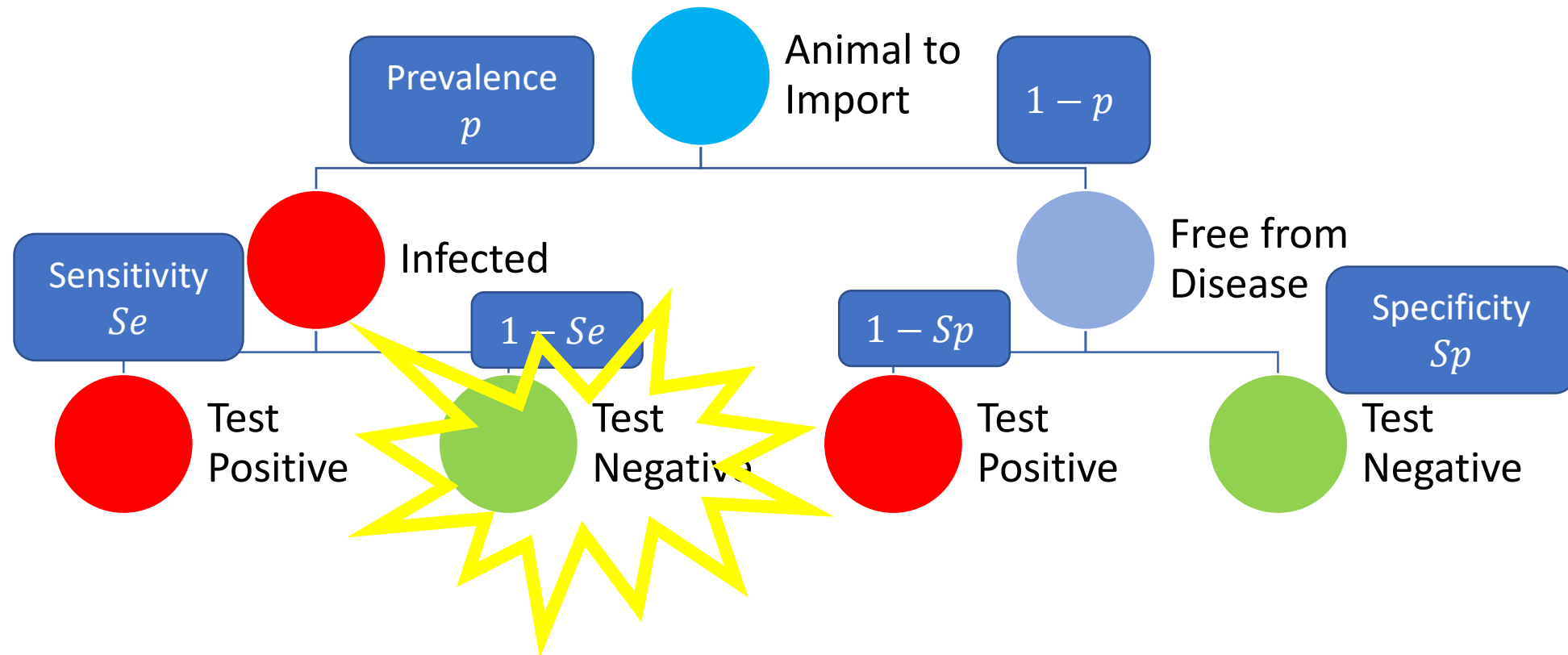


Scenario tree - IRA



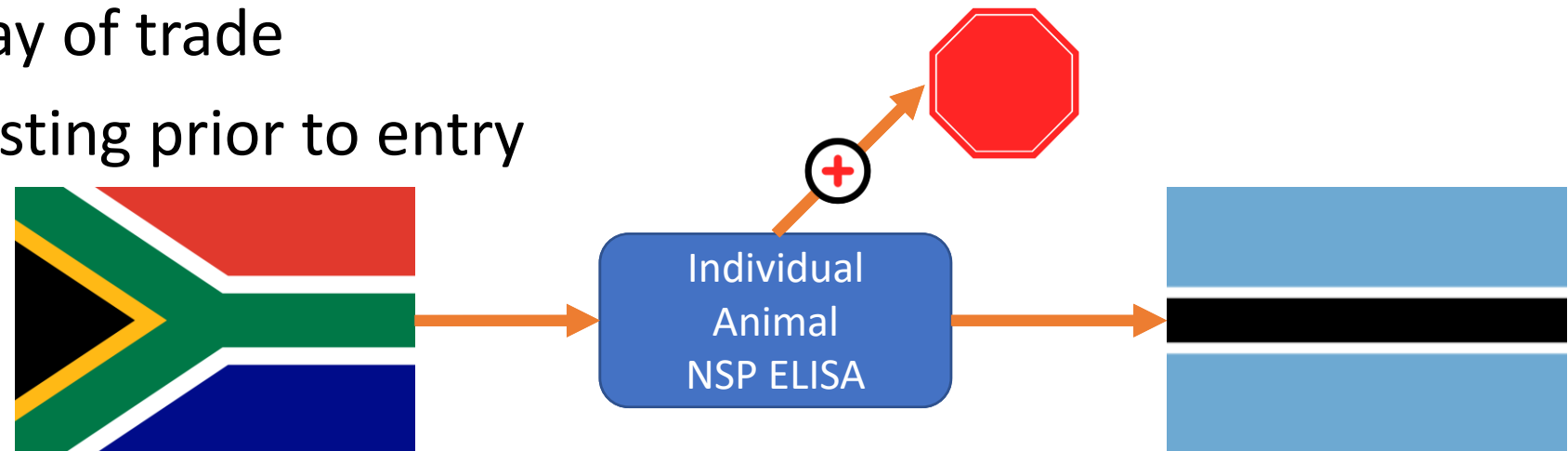
So where is the risk?

Scenario tree - IRA



Practical Example: Entry risk of FMDV for cattle entering South Africa

- Scope: Live domestic cattle imported into Botswana from South Africa
- Hazard: Infection with *Foot and mouth disease virus*
- Existing pathway of trade
- Assume NSP testing prior to entry



What data/information do we need?

- Underlying prevalence in South Africa
 - Population at Risk in South Africa
 - Occurrence of FMDV in South Africa
- Commodity that is being traded and estimated volumes
- Test characteristics (NB sensitivity) of the diagnostic test employed (NSP ELISA)

Sourcing data

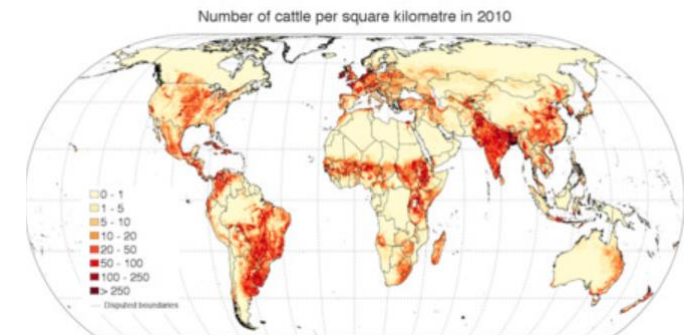
- Animal Health Data
 - Country request
 - Country websites
 - WOAHA WAHIS
 - Empres-I (FAO)
 - Publications
 - Laboratory test validations

Underlying disease prevalence

- **Cases:** demonstrate – country database - *prevalence_DB.R*

- **Population at risk**

- Gilbert, Marius; Nicolas, Gaëlle; Cinardi, Giusepina; Van Boeckel, Thomas P.; Vanwambeke, Sophie; Wint, William G. R.; Robinson, Timothy P., 2018, "Global cattle distribution in 2010 (5 minutes of arc)", <https://doi.org/10.7910/DVN/GIVQ75>, Harvard Dataverse, V3



Animals moved

Year	total Imported
2014	476
2015	150
2016	6991
2017	3456
2018	49141
2019	100
2020	852



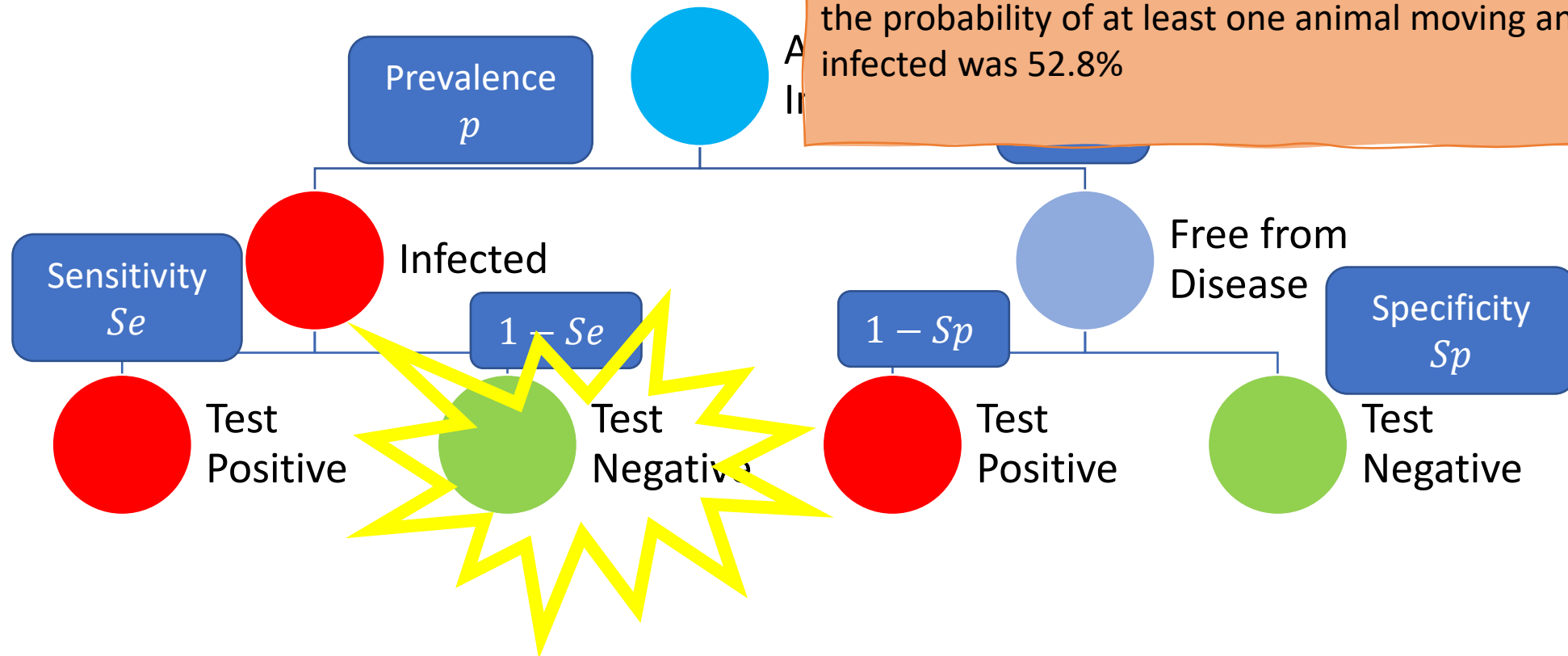
Results

entryRiskAssessment_Deterministic.R

Individual animal: 0.0002176886
~ 1 in every 4593 animals that move

During 2018 where 49141 animals moved
the probability of at least one animal moving and being
infected was 99.9%

During 2017 where 3456 animals moved
the probability of at least one animal moving and being
infected was 52.8%



Q&A and Practical: Deterministic Risk Analysis

- What are some of the short-comings of the basic assessment we've just done?
- How would we improve the assessment
- How would it change the risk if no testing was performed?
- How would it change the risk if clinical signs were also 'tested'?
- Draw a scenario tree where pre-movement quarantine is included and what parameters would you need to estimate?

Practical

- If there is time develop a scenario tree for a FMDV risk process along the value chain in (within or into) your country
- What parameters would you need to know?