

# Rift Valley Fever Vaccines Update

Djibouti 21-23 April 2015

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Onderstepoort Biological Products  
South Africa



# Mandate of OBP

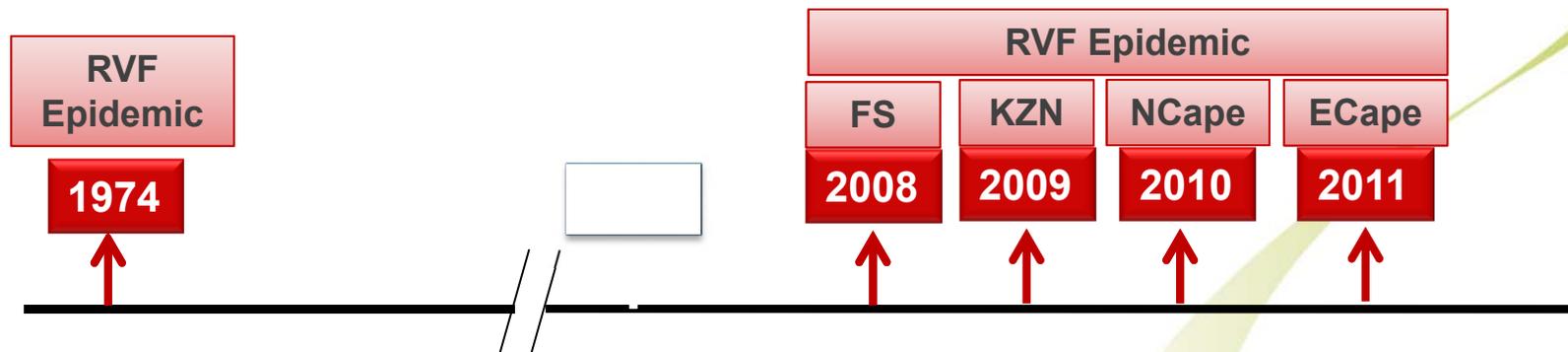
South African State Owned Company  
(SOC)

The mandate of OBP is to prevent and control animal diseases that impact food security, human health and livelihoods.

Modest profits to ensure sustainability



# RVF threat to animal, human and food security - South Africa

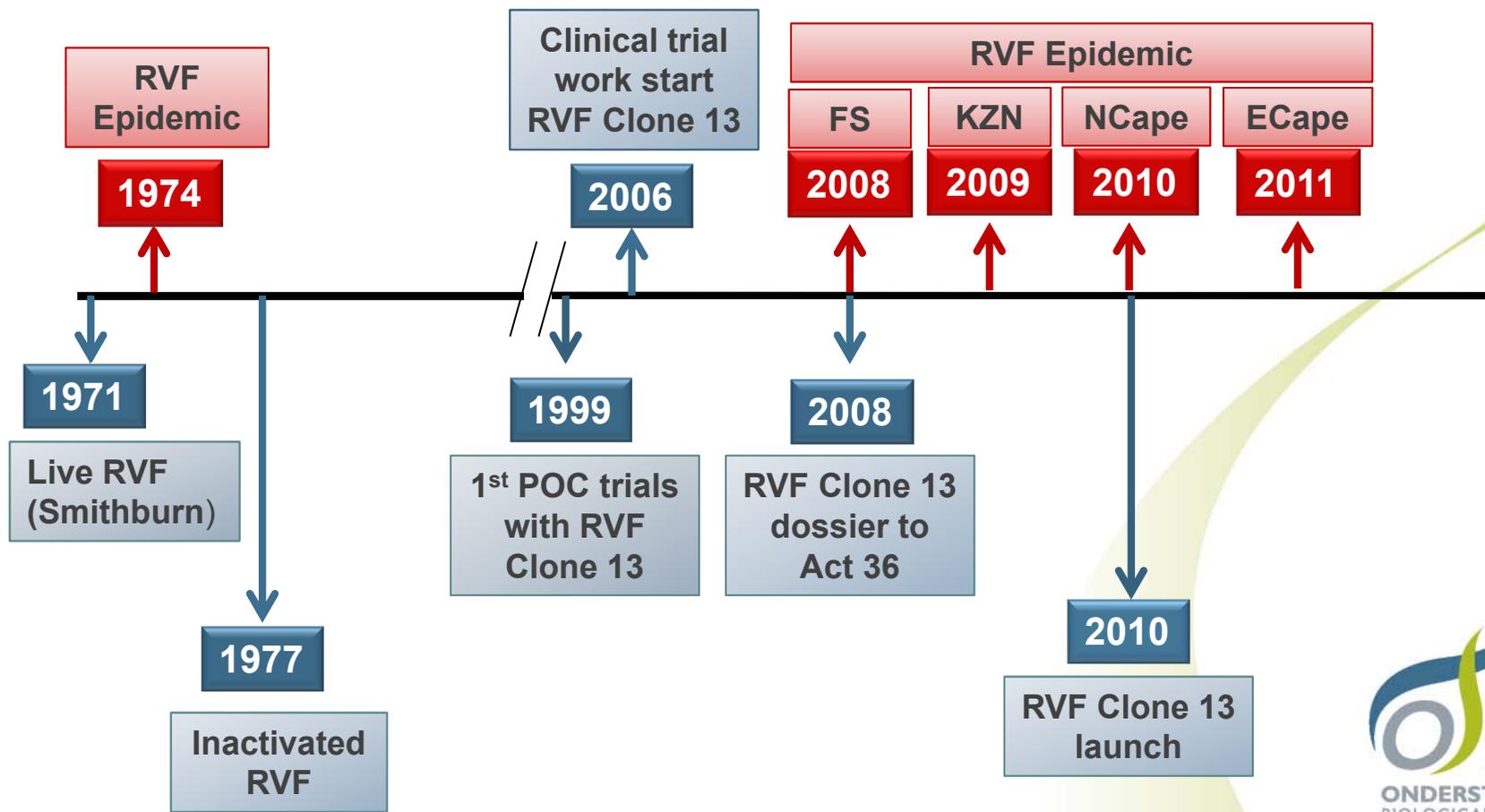


# Onderstepoort RVF vaccines

- **RVF inactivated**
  - South Africa (G 1349; Act 36/1947)
  - Namibia (NSR 0966)
  - Tanzania
- **RVF Smithburn**
  - South Africa (G 0119; Act 36/1947)
  - Namibia (NSR 0580)
  - Tanzania
- **RVF Clone 13**
  - South Africa (G 3876; Act 36/1947)
  - Namibia (NSR 1516)

# RVF vaccines currently in use

## South Africa - timelines



# **RVF vaccines currently in use**

## **issues**



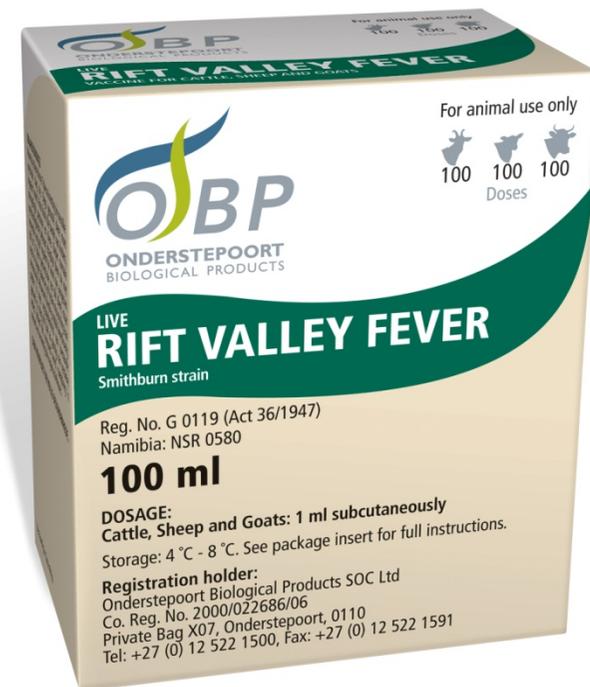
# Live attenuated RVF Smithburn vaccine

## Live attenuated (Smithburn strain) (1971)

- Mouse adapted partially attenuated Smithburn strain
- Relatively easy and safe to produce
- Relatively short lead time
- Immunogenic after single dose
- Long lasting immunity
- BUT annual vaccination in endemic areas is recommended

### Concerns:

- May be teratogenic in pregnant animals
- Risk of reversion to virulence
- Not advisable for use in an outbreak



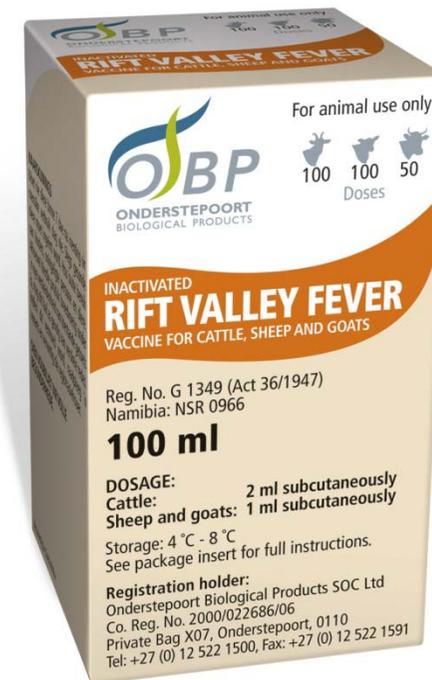
# Inactivated RVF vaccine

## Inactivated vaccine (virulent field strain) (1977)

- Wild-type, virulent virus
- Inactivated adjuvanted vaccine
- Long lead time
- High antigen payload required
- Safe in pregnant animals
- Can be used in outbreak
- Booster dose and more frequent vaccination required to maintain adequate level of immunity

### Concerns:

- Occupational risk in manufacturing
- Special, isolated production facility needed – occupational hazard/risk



# RFV C13

## RFV Clone 3 (avirulent RVF, 74HB59 strain)

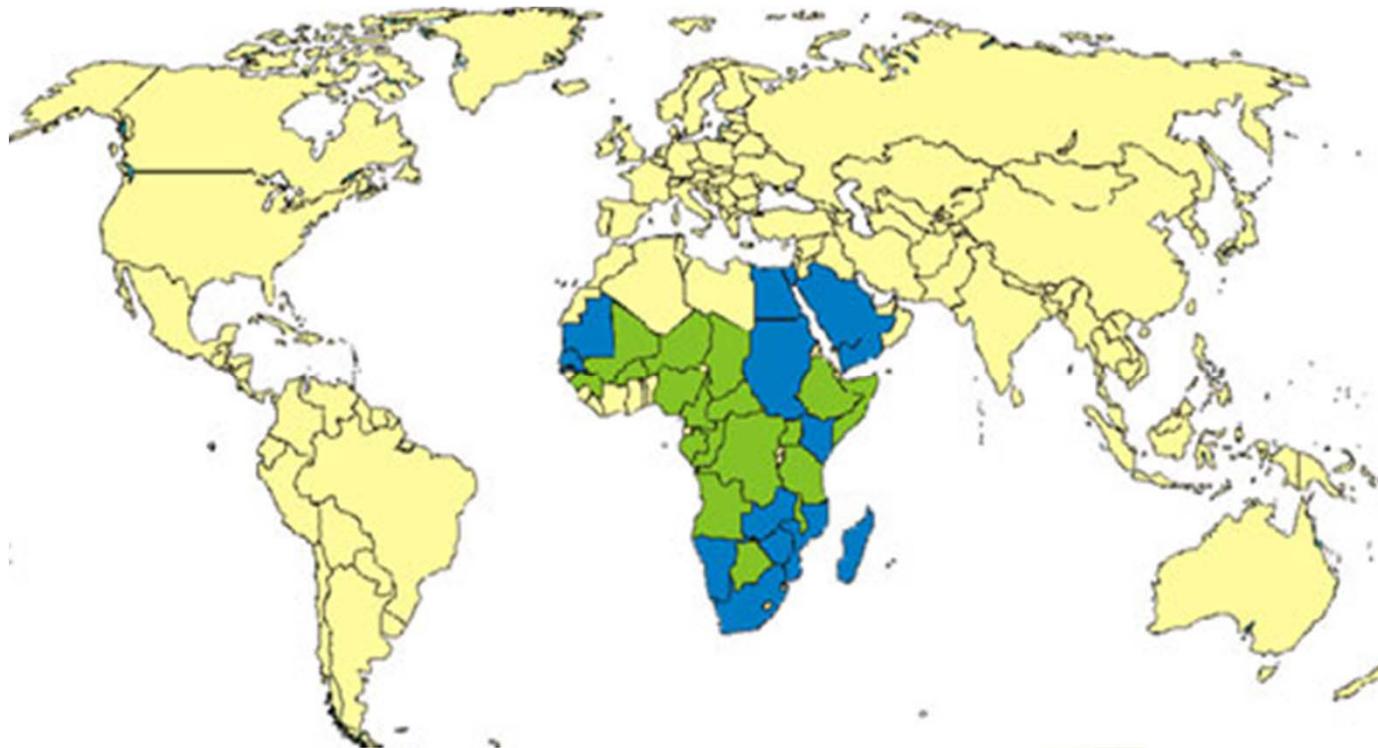
- Highly attenuated naturally avirulent
- Potential DIVA vaccine: deletion (549 nucleotides) within the NSs segment
- Safe for use in early pregnancy
- Safe for use in sheep/goats and cattle
- Induces a good protective antibody response
- Vaccine production is safe and cost-effective
- Comparable lead time to live vaccine

### Concerns:

- Stability problems
- Cold storage chain maintenance
- Short shelf life



# Distribution of RVF – Target markets?



**Countries with endemic disease and substantial outbreaks of RVF:**

Gambia, Senegal, Mauritania, Namibia, South Africa, Mozambique, Zimbabwe, Zambia, Kenya, Sudan, Egypt, Madagascar, Saudi Arabia, Yemen



**Countries known to have some cases, periodic isolation of virus, or serologic evidence of RVF:**

Botswana, Angola, Democratic Republic of the Congo, Congo, Gabon, Cameroon, Nigeria, Central African Republic, Chad, Niger, Burkina Faso, Mali, Guinea, Tanzania, Malawi, Uganda, Ethiopia, Somalia

Source: OIE

# Vaccination strategy conundrum

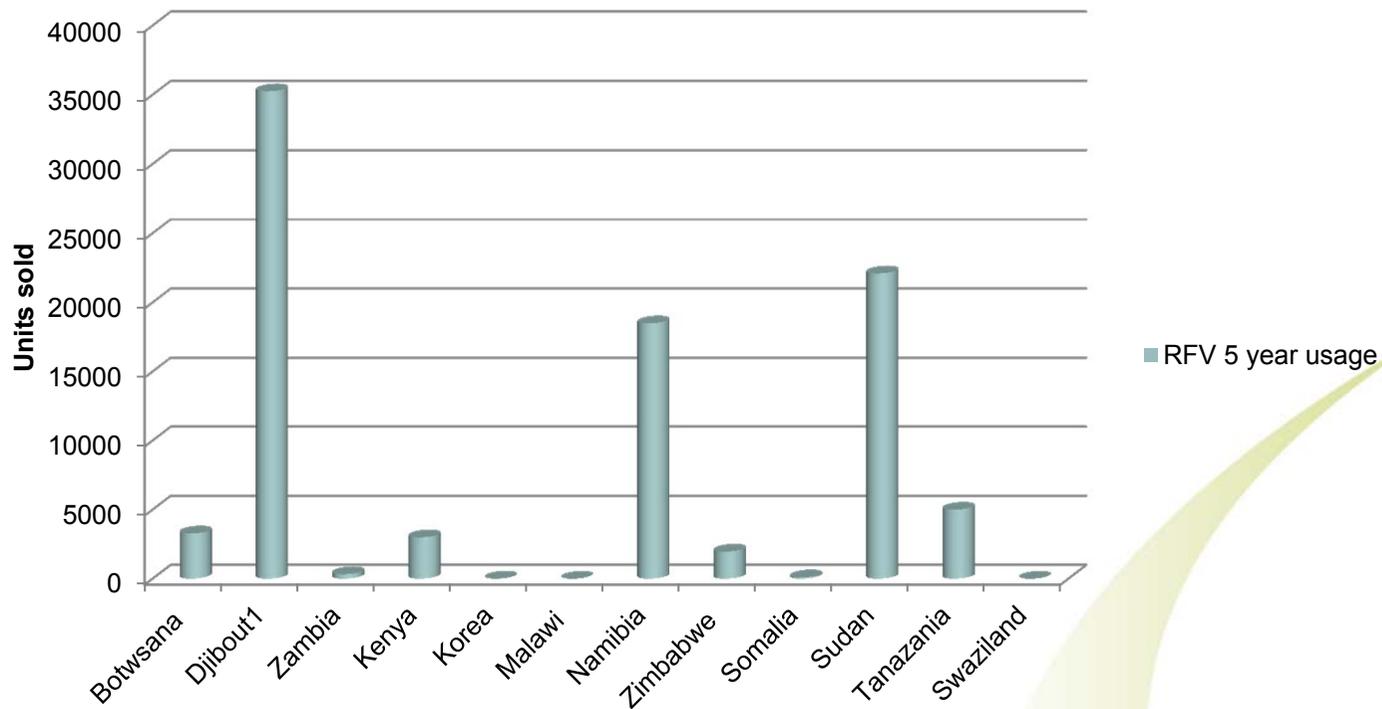
RIFT VALLEY FEVER	COUNTRY EXAMPLES	CONTROL STRATEGY
Endemic with regular outbreaks	Kenya, Tanzania, Egypt, Senegal, Mali	Continuous vaccination/yearly vaccination
Endemic with sporadic/re-occurring outbreaks	South Africa, Saudi Arabia	Continuous/yearly vaccination
Free-High risk	Middle East, North Africa	(Active) surveillance
Free- Low risk	Europe, Americas	Surveillance, talks of vaccine banks

Source:OIE,2012



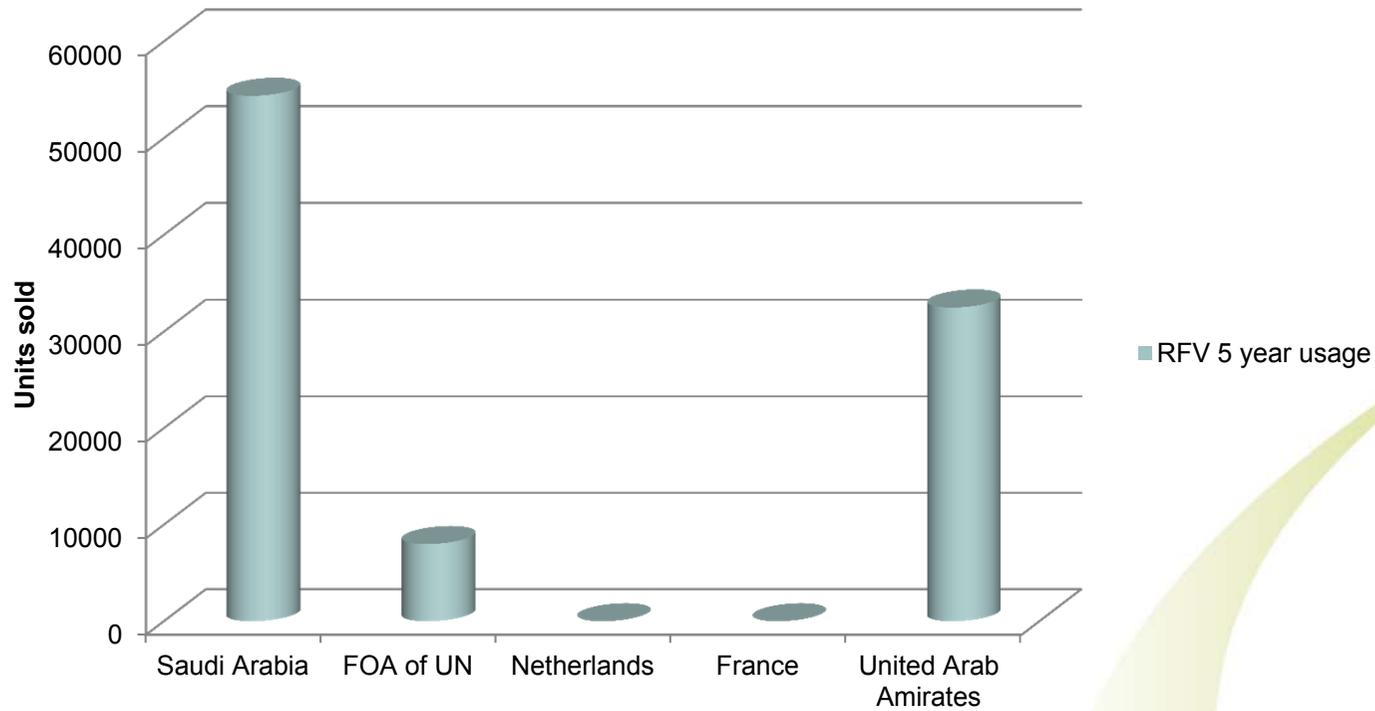
# RVF 5 year usage OBP vaccines

## African countries



# Other countries

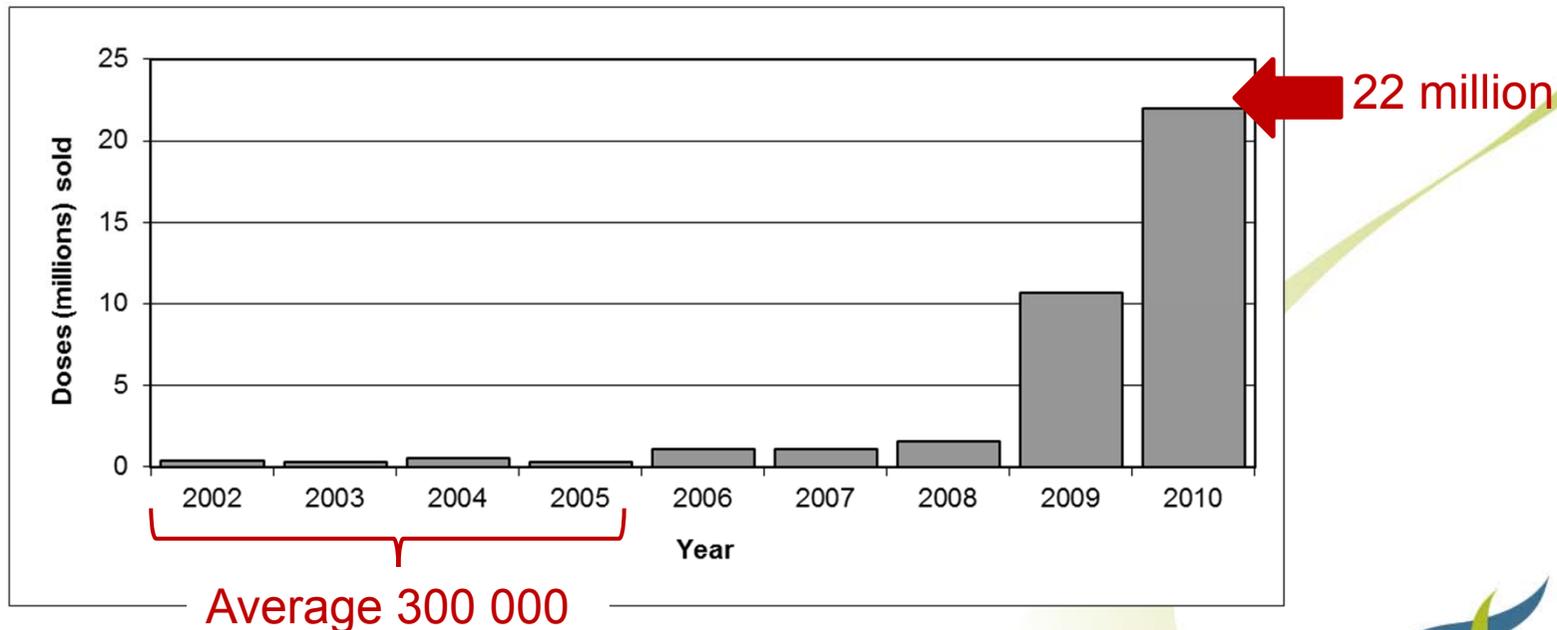
Other countries



# Onderstepoort RVF vaccines

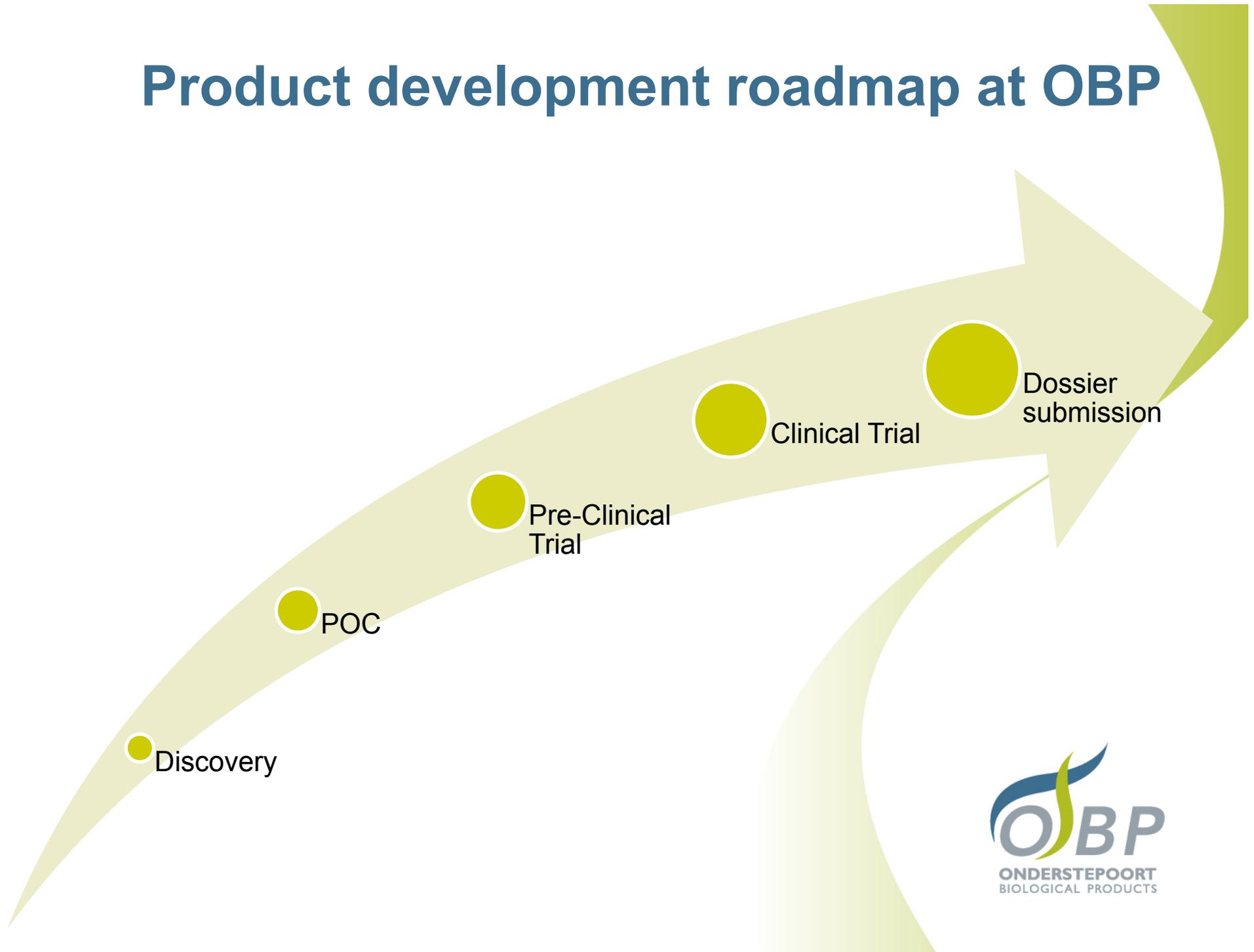
## Situation in South Africa

- During outbreaks a huge demand for vaccines (1973/74; 1994; 2008/09; 2010)
- In between outbreaks – vaccine stock often destroyed due to expiry



OBP RVF vaccine doses sold in South Africa between 2002 and 2010.

# Product development roadmap at OBP



# RFV Clone 13 Pipeline and continuous vaccination strategy stimulation

- **RVF Clone 13 vaccine stability:**
  - Stable for 9 months as a freeze dried product at 4 degree C
  - Testing of different stabilizers and temperatures
- **RVF Clone 13 multivalent:**
  - RVF/Lumpy Skin Disease vaccine combination



**Thank You**

