

# Schmallenberg virus:

## Is there evidence the virus continues to circulate?

Áine Collins<sup>1,2</sup> Ann Hallinan<sup>3</sup>, Damien Barrett<sup>4</sup>, Michael Doherty<sup>2</sup> and John Mee<sup>1</sup>



### Conclusions

Low level of SBV circulation in 2013 and 2014

No evidence SBV circulation in 2015

### Introduction

Schmallenberg virus (SBV), transmitted by *Culicoides* spp. biting midges, causes ruminant abortions and congenital malformations, and mild clinical signs in adult dairy cattle (milk drop, fever, diarrhoea).

Following the initial Schmallenberg epidemic (2011 – 2012) the number of newly reported cases rapidly declined suggesting that virus circulation had ceased to occur since 2012. Recently (2014), SBV re-emergence has been reported in Germany<sup>1</sup>. However, there is limited research on SBV circulation since 2012.

### Objectives

- ✓ Investigate SBV circulation in dairy herds in 2013, 2014 and 2015 following initial exposure to the virus in 2012
- ✓ Determine the extent of the susceptible animal population in previously exposed dairy herds

### Materials and Methods

#### ✓ Herds

26 Irish dairy herds (exposed to SBV in 2012)  
Herd size range 58-444 lactating animals per herd

#### ✓ Blood samples

Individual animal blood samples collected before (spring) and following (winter) the 2014 vector-active season and following (winter) the 2015 the vector-active season were tested for SBV-specific antibodies (ID Screen® ELISA *Schmallenberg virus Competition Multi-species*)

Blood samples	Spring 2014 n= 5531	Winter 2014 n= 2483	Winter 2015 n= 1440
Lactating cows (born before 2013)	4047 (73%)	288* (12%)	–
Heifers (born spring 2013)	1480 (27%)	645* (26%)	–
Youngstock (born spring 2014)	–	1550 (62%)	1440 (100%)

\*Blood samples collected from a subsample (n = 933) of seronegative cows and heifers identified in spring 2014

#### ✓ *Culicoides* SBV vectors spp.

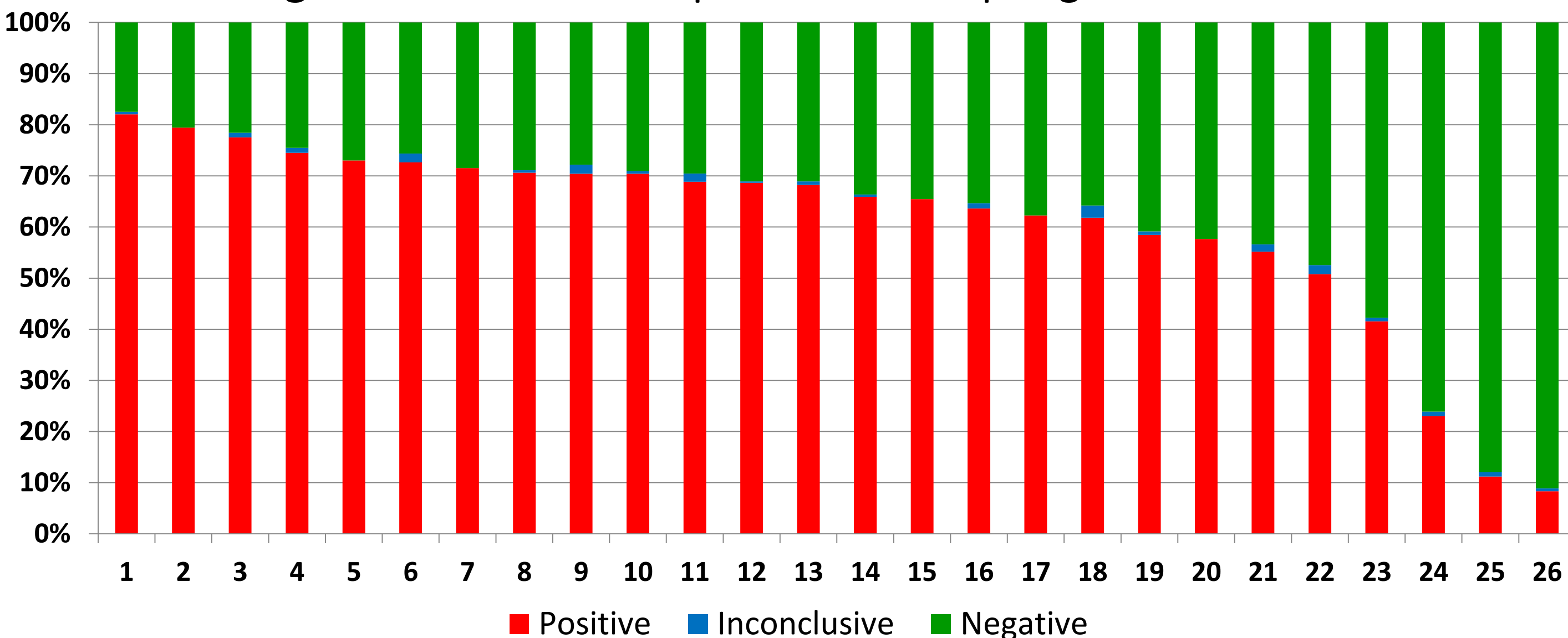
3,043 pigmented *Culicoides* SBV vector spp. (138 pools; average 22 *Culicoides* specimens per pool) collected from 10 study herds during the 2014 vector-active season were analysed for SBV RNA using rt-RT-PCR

### Results

#### Spring 2014

- Animal-level seroprevalence was 62.5%, 84.7% in cows and 0.6% in heifers
- Within-herd seroprevalence ranged widely from 8.5% to 84.1% in the 26 herds (Fig. 1); 10.7% to 100% in cows and 0.2% to 1.4% in heifers

Fig. 1 Within-herd seroprevalence in Spring 2014



### Evidence of SBV circulation

#### Winter 2014

- 95.5% of animals (95.6% of cows and 99.1% of heifers) re-sampled in winter 2014 remained seronegative after the 2014 vector-active season (Fig. 2)
- 22 animals (0.9%; 10 cows, 5 heifers and 7 youngstock) originating in 17 herds (1-4 animals per herd) tested seropositive

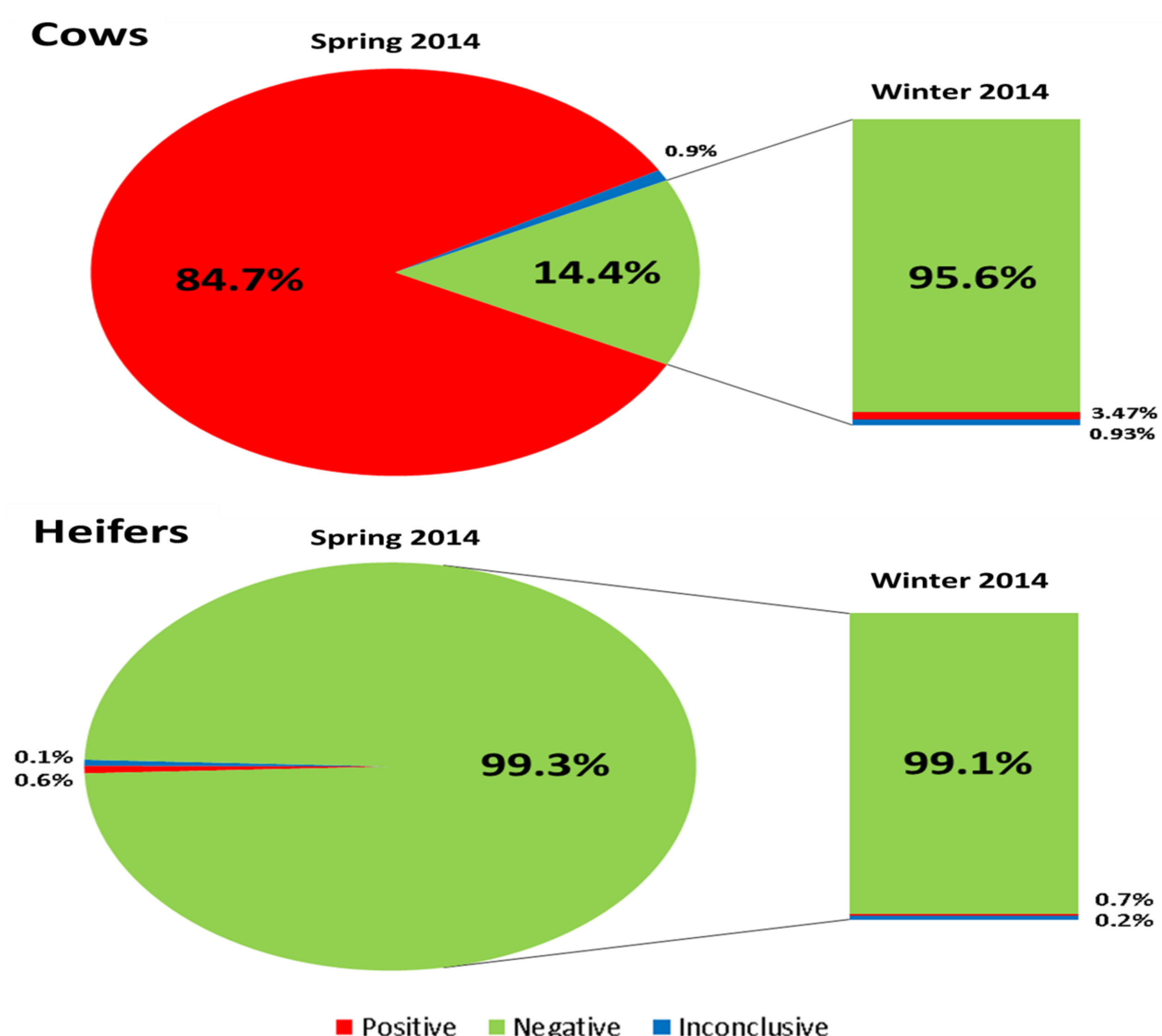
#### Winter 2015

- All youngstock tested seronegative, including the 7 test-positive animals from winter 2014

#### *Culicoides* midge vector spp.

- All 138 *Culicoides* pools tested negative for SBV RNA

Fig. 2 Animal-level seroprevalence after the 2014 vector-active season



### Discussion

- A wide variation in within-herd seroprevalence in spring 2014 suggests varying risks of infection before the 2014 vector-active season
- The 22 test-positive animals (0.9%; 10 cows, 5 heifers and 7 youngstock) identified in winter 2014 originated in 17 herds (1-4 animals per herd)
- All *Culicoides* pools tested negative for SBV RNA
- The 7 test-positive youngstock identified in winter 2014 tested seronegative in winter 2015, suggesting their initial positive result was due to persistence of maternal antibodies
- These findings suggest SBV recirculated at a low level in these herds in 2013 and 2014, while there was no evidence of SBV circulation in youngstock in 2015. A large population of naive animals, youngstock in particular, were identified in these herds and may be at risk of SBV infection should SBV re-emerge as it has done in continental Europe

### Acknowledgements

Áine was awarded the 2017 SVEPM student bursary which contributed to her SVEPM conference attendance.