

Dr. Carles Vilalta is a DVM, PhD from Spain who started as a post-doctoral researcher with our SHMP project in April. Carles has been reviewing our calculations and charting process for our SHMP data and this poses a great opportunity to summarize them again for you. Bob Morrison (BobM@UMN.Edu)

Review of the charts of SHMP. Chart 4 - PRRS quarterly count of breaks and chart 5 - PRRS EWMA analysis for years 2009 - 2017

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Key Points:

- The EWMA chart is a smoothed chart of the percentage of farms that are breaking.
- The new farms added to SHMP could be affecting the EWMA chart giving the indication that PRRS season has changed.

This is the last science page of the series dedicated to reviewing the PRRS charts appearing on the SHMP report. In this issue we are going to review chart 4 and chart 5.

Chart 4 depicts the count of outbreaks depending on the previous status of the farm when it had the break and it is showed quarterly. This chart also shows, as in chart 5, the Exponential Weighted Moving Average (EWMA) for the percentage of new cases. The EWMA charts are weighted control charts that are suited to track processes that exhibit a drifting mean over time or for noticing small changes in a process, as in the case of the number of cases per week.

The formula used in the EWMA chart is the following:

$$E = \lambda \times I_t + (1 - \lambda) \times E_{t-1}$$

where E is the smoothed % of infected herds, λ the constant smoothing the curve, I the % of infected herds during that week and E_{t-1} is the smoothed % of infected herds during the previous week.

A recent question we had was if the incidence of PRRS has changed. Let's compare the raw incidence data (Fig 1 – green line) with the EWMA of number of cases (Fig 1 – orange line) and the EWMA of % of cases (Fig 1 - blue line). As the number of SHMP enrolled herds has increased, the raw number (green) and EWMA of number of cases (orange) have increased. One possible reason the EWMA % of cases is decreasing might be that the number of farms that are breaking expressed as a percentage is less. This can be due to the fact that the total number of farms sharing PRRS status has been increasing and these new farms might have a lower underlying incidence.

We have almost double the number of farms participating in the monitoring program currently as compared to 2012. In addition to influencing the % of cases, the fact that these farms are located in different regions across the country could reflect slight differences (delay or advance)

breaks could be widening the base of the PRRS seasonal peak in the EWMA % chart and giving the feeling that the season is longer than it was.

We continue screening and analyzing the SHMP data that you share looking for new insights and to provide you with more information related with the spread and distribution of the disease. This month, we will be giving you access to your data so you can compare incidence across systems, regions of the country and years of reporting.

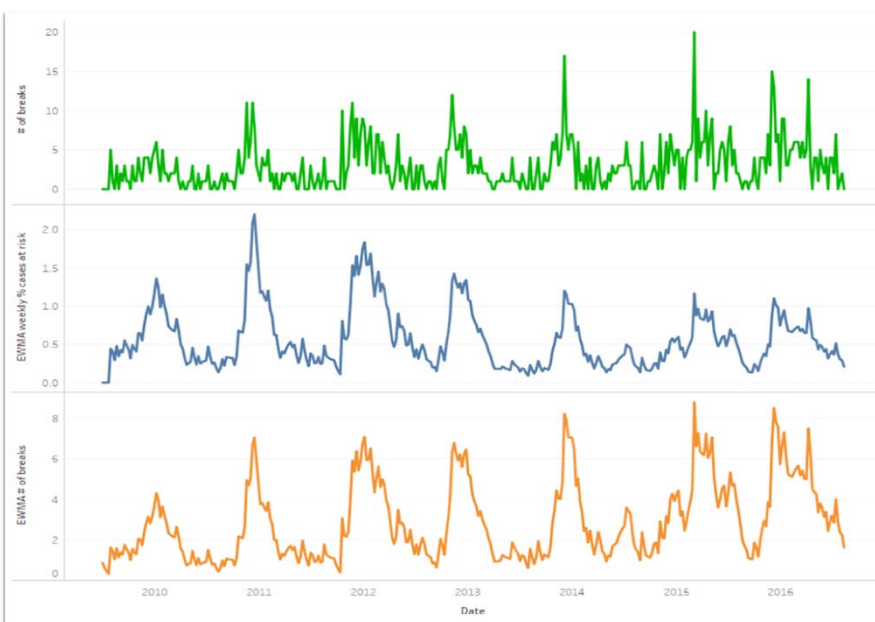


Figure 1. Weekly incidence expressed as number of breaks (green line), as EWMA % of herds at risk