# SWINE DISEASE REPORTING SYSTEM

**Swine Disease Reporting System
report 4 (June 5th, 2018)**

## What is the SDRS?

SHIC-funded, veterinary diagnostic laboratories (VDLs) collaborative project, with goal to aggregate swine diagnostic data from participating reporting VDLs, and report in an intuitive format (web dashboards), describing dynamics of disease detection by pathogen or disease syndrome over time, specimen, age group, and geographical space.

For this report, to help develop the template, data is from the Iowa State University VDL. Specifically, for PRRSV PCR results, there was a contribution from the University of Minnesota VDL. Other VDLs should be participating soon.

For all "2018 predictive graphs", the expected value was calculated using a statistical model that takes into account the results from 3 previous years. The intent of the model is not to compare the recent data (2018) to individual weeks of previous years. The intent is to estimate expected levels of percent positive cases based on patterns observed in the past data, and define if observed percentage positive values are above or below the expected based on historic trends.

*Collaborators:*

*Iowa State University*: Giovani Trevisan\*, Leticia Linhares, Bret Crim; Poonam Dubey, Kent Schwartz, Rodger Main, Daniel Linhares\*\*.

*University of Minnesota*: Mary Thurn, Paulo Lages, Kimberly VanderWaal, Andres Perez, Jerry Torrison.

*Kansas State University*: Jamie Henningson, Eric Herrman, Gregg Hanzlicek, Ram Raghavan, Douglas Marthaler.

*South Dakota State University*: Jon Greseth, Jane C. Hennings.

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\*\* Daniel Linhares: Principal investigator. E-mail: linhares@iastate.edu.

## Advisory Council:

The advisory group reviews the data to discuss it and provide their comments to try to give the data some context and thoughts about its interpretation: Clayton Johnson, Emily Byers, Hans Rotto, Jeremy Pittman, Mark Schwartz, Paul Sundberg, Paul Yeske, Pete Thomas, Rebecca Robbins, Tara Donovan.

**This report is an abbreviated version of the dashboards that are available online.**

To access the full data, use your computer, tablet, or phone to:

1) Scan the code below, or go to: www.powerbi.com
2) Login: sdrs@iastate.edu
3) Password: Bacon 100
4) On the left bar, click on 'Apps'
5) Select your dashboard of interest (e.g. PRRS)

Power BI

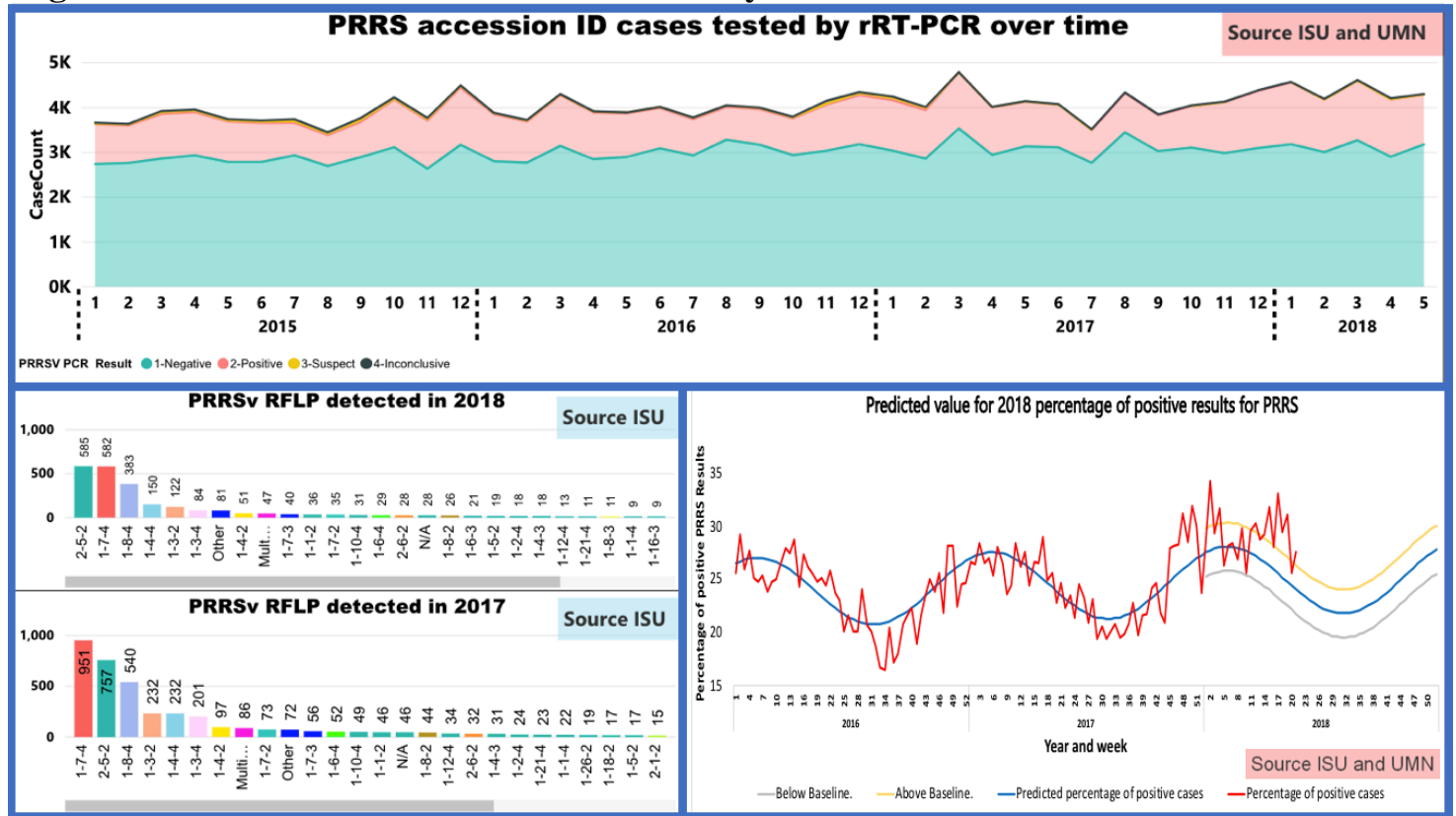## Page 1 – Detection of PRRSV RNA over time by rRT-PCR.



**Figure 1** *Top chart*: Results of PRRS rRT-PCR cases over time. *Bottom right*: expected percentage of positive results for PRRSV RNA by rRT-PCR, with 1 standard deviation above and below the expected value. *Bottom left*: PRRS virus RFLPs detected on 2017, and 2018.

PRRS rRT-PCR data from the University of Minnesota Veterinary Diagnostic Laboratory (UMN-VDL) was consolidated with the data from the Iowa State University Veterinary Diagnostic Laboratory (ISU-VDL).

**SDRC Advisory Council highlights:**
1) There was a relative increase of cases testing positive for PRRSv RNA by rRT-PCR in wean to market pigs this winter (December 2017 to February 2018). Recently, during the 2018 spring, there was an increase in PRRS detection by PCR in sow farms. The growing use of 'processing fluids' as specimen for PRRS monitoring contributed to the increase of overall positive results by 1.03%, as processing fluids-based monitoring appears to be more sensitive than individual pig serum-based monitoring schemes.
2) The recent spike in PRRSv detection coincides with a higher PRRSv incidence reported by the MSHMP project.

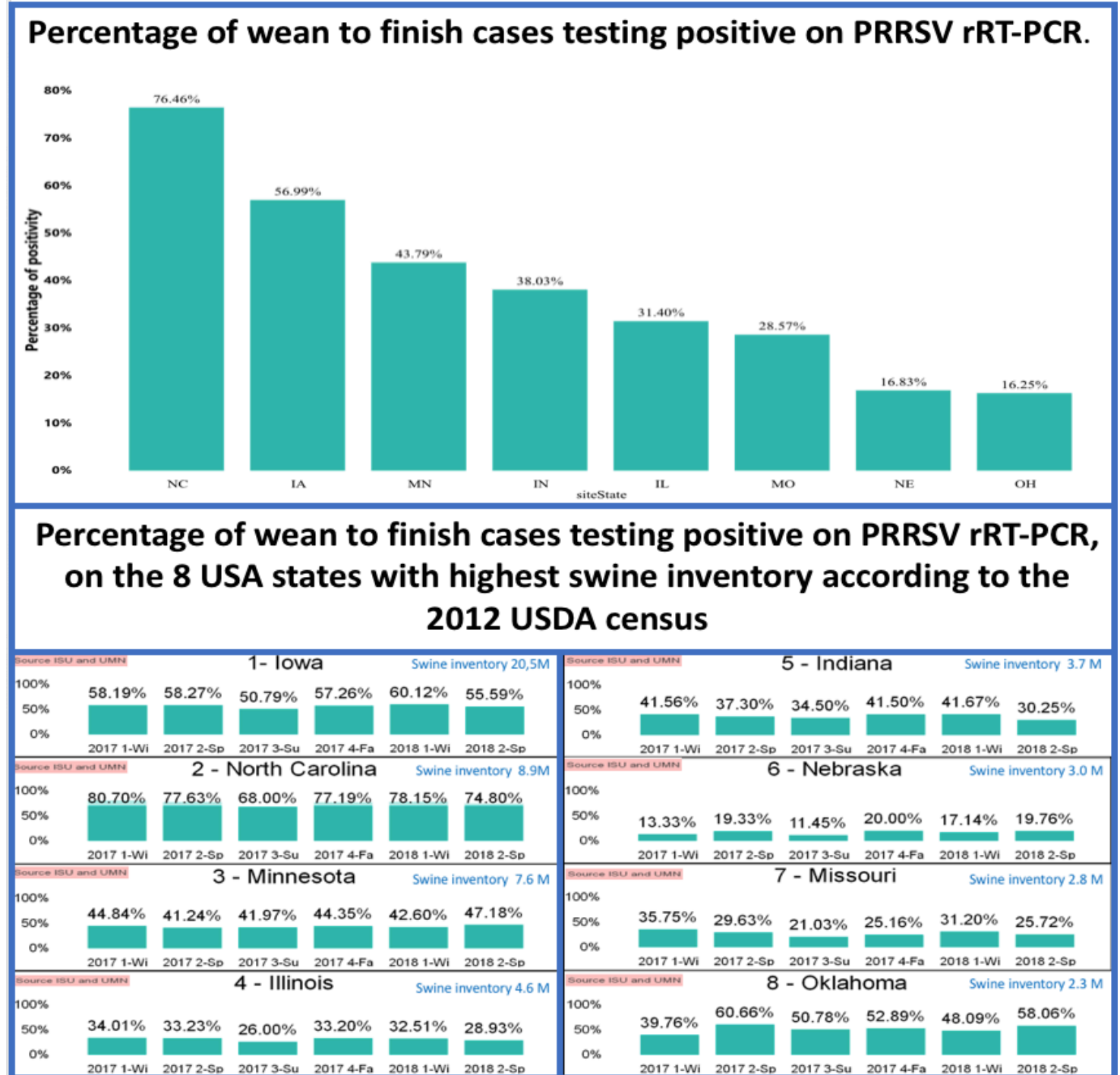**Page 2 – Percentage of positive results detected on PRRSV RNA tested by rRT-PCR.**



**Figure 2** *Top chart*: Overall percentage of positive results on wean to market animals for PRRSV tested by rRT-PCR cases from 12/01/16 to present at the top swine inventory states according to 2012 census. *Bottom*: Percentage of positive results by season for the states on top chart.

**SDRC Advisory Council highlights:**
1) PRRS detection by rRT-PCR in wean-to-finish pig cases coincides with field observations, that states with higher swine density are more likely to become infected with PRRS during grow-finish.
2) The results represent PRRSV RNA detection by state; and are <u>not</u> a representation of prevalence.

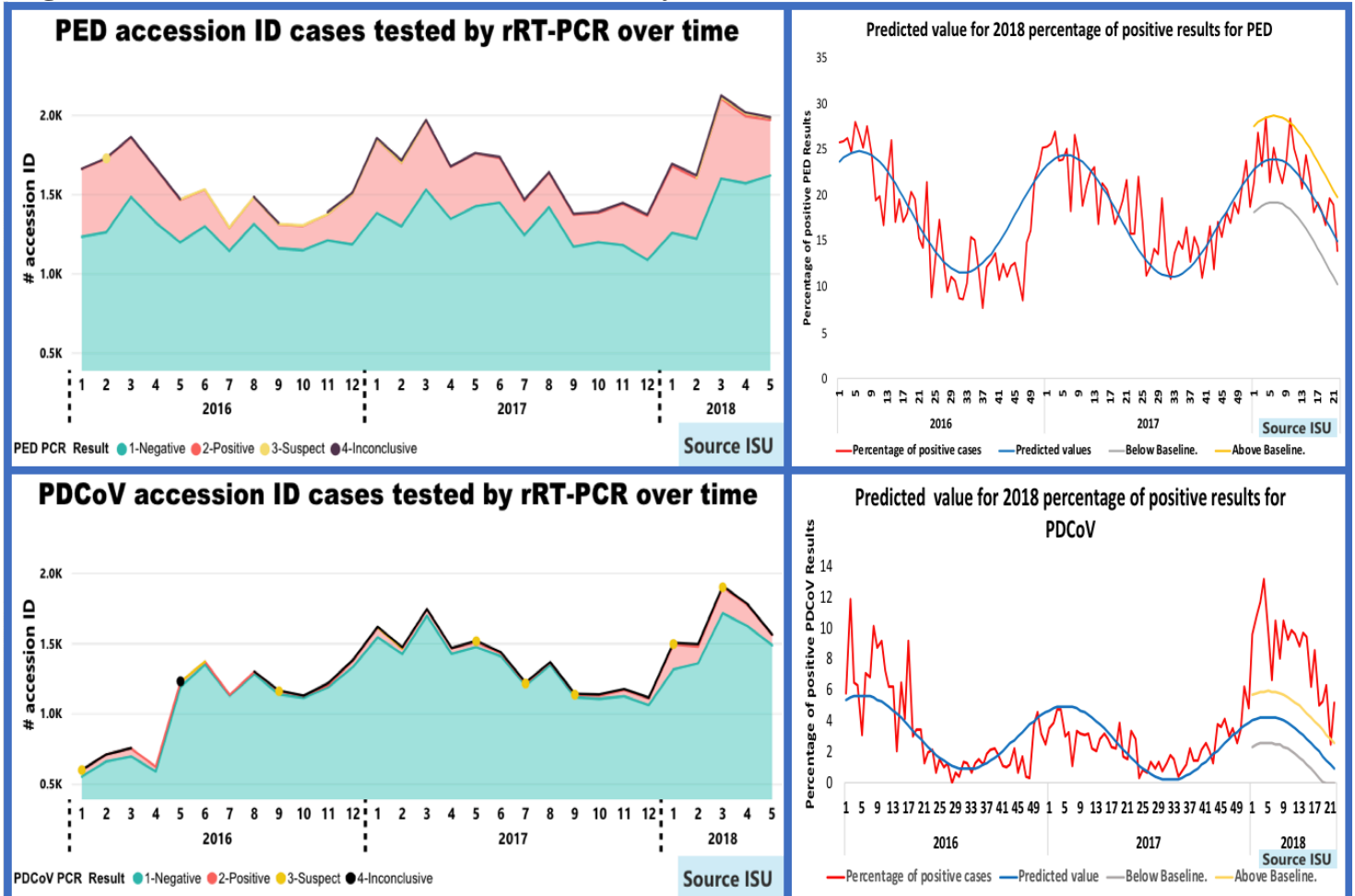## Page 3 – Detection of enteric coronaviruses by rRT-PCR



**Figure 3** Left side: results of PEDV, and PDCoV rRT-PCR cases over time. Right side charts: expected percentage of positive results for PEDV and PDCoV by rRT-PCR, with 1 standard deviation above and below the expected value, respectively.

**SDRC Advisory Council highlights:**

1) Deltacoronavirus (PDCoV) activity continues high, relative to predicted values based on previous years;
2) Increased detection of PDCoV does not appear to be associated with increased outbreaks in sow farms at this time of the year. Perhaps the higher detection rate was a reflection of increased PDCoV outbreaks this winter (December 2017-February 2018):
   a. The percentage of positive results for sow farms was 9.48% for 2018 winter, and 5.54% for 2018 spring.
   b. The percentage of positive results for wean to market was 8.52% for 2018 winter and 9.88% for 2018 spring

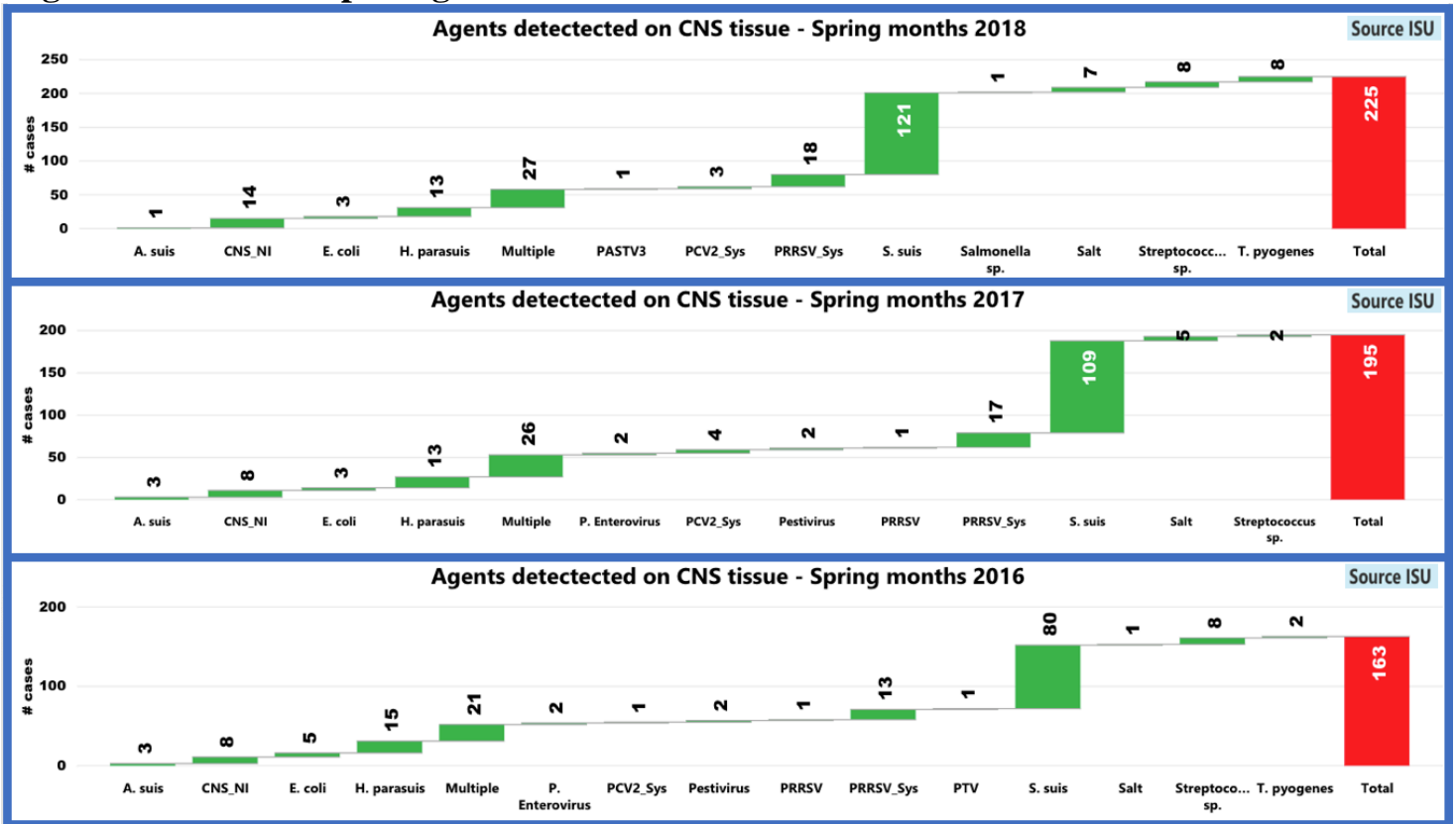## Page 4 – Detection of pathogens associated with CNS disease



**Figure 4** Pathogen detection on CNS tissue over time. Each green bar indicates a different agent or syndrome. The red bar accounts for the sum of the green bars. Bottom: spring months of 2016, middle spring months of 2017, top spring months of 2018. Spring months contains results of March, April, May. 'Multiple agents' represent cases with more than one pathogen detected on CNS tissues.

**SDRC Advisory Council highlights:**
a) There was an 15.38% increase in the number of cases in 2018 compared to 2017 (from 195 to 225 cases) during spring months.
b) *Streptoccocus suis* continues to be the main pathogen associated with CNS disease.