Swine Disease Reporting System
Report 22 (December 3 , 2019)

What is the Swine Disease Reporting System (SDRS)?

SDRS includes multiple projects that aggregate data from participating veterinary diagnostic laboratories (VDLs) in the United States of America, and reports the major findings to the swine industry. Our goal is to share information on endemic and emerging diseases affecting the swine population in the USA, assisting veterinarians and producers to make informed decisions on disease prevention, detection, and management.

After aggregating information from participating VDLs and summarizing the data, we ask the input of our advisory group, which consists of veterinarians and producers across the USA swine industry. The intent is to provide interpretation of the data observed, and summarize the implications to the industry. Major findings are also discussed in monthly podcasts. All SDRS programs are available at www.fieldepi.org/SDRS:

Swine Health Information Center (SHIC)-funded Domestic Disease Surveillance Program: collaborative project among multiple VDLs, with the goal to aggregate swine diagnostic data and report in intuitive formats (web dashboards and monthly PDF report), describing *dynamics of pathogen detection by PCR-based assays over time, specimen, age group, and geographical area*. Data is from the Iowa State University VDL, South Dakota State University ADRDL, University of Minnesota VDL, and Kansas State University VDL.

Collaborators*:*

Iowa State University: Giovani Trevisan*, Edison Magalhães, Leticia Linhares, Bret Crim, Poonam Dubey, Kent Schwartz, Eric Burrough, Phillip Gauger, Rodger Main, Daniel Linhares**.

* Project coordinator (trevisan@iastate.edu). ** Principal investigator (linhares@iastate.edu).

University of Minnesota: Mary Thurn, Paulo Lages, Cesar Corzo, Jerry Torrison.

Kansas State University: Rob McGaughey, Eric Herrman, Gregg Hanzlicek, Jamie Henningson.

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

Disease Diagnosis System: This is a pilot program with the ISU VDL, which consists of reporting *disease detection* (not just pathogen detection by PCR), based on diagnostic codes assigned by veterinary diagnosticians.

FLUture: This is a project that aggregates *Influenza A virus (IAV) diagnostic data* from the ISU VDL, including test results, metadata, and sequences.

PRRS virus RFLP report: Benchmarks patterns of PRRSV RFLP type detected at the ISU VDL over time, USA state, specimen, and age group.

Audio and video reports: Key findings are summarized monthly in a conversation between investigators, and available in form of an audio report and video report though YouTube.

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, Mark Schwartz, Paul Sundberg, Paul Yeske, Rebecca Robbins, Tara Donovan, Deborah Murray, Scott Dee, Melissa Hensch.

This report is an abbreviated version of the content available online at www.fieldepi.org/SDRS.

Topic 1 – Detection of PRRSV RNA over time by RT-qPCR.

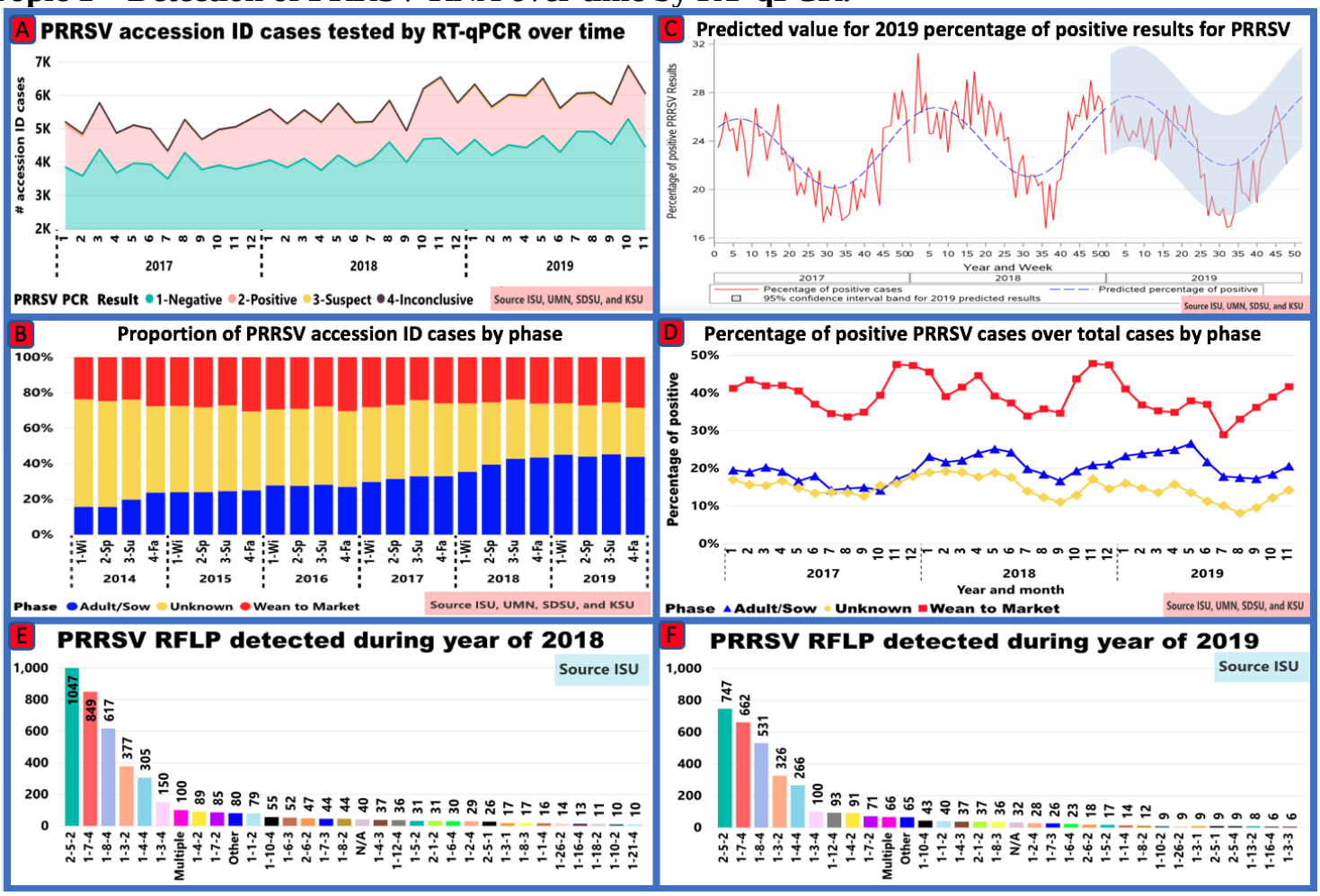

Figure 1. A: Results of PRRS RT-qPCR cases over time. **B**: Proportion of accession ID cases tested for PRRSV by age group per year and season. **C**: expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on weekly data observed in the previous 3 years. **D**: percentage of PRRS PCR-positive results, by age category over time. Wean to market corresponds to nursery and grow-finish. Adult/Sow correspond to Adult, boar stud, breeding herd, replacement, and suckling piglets. Unknown corresponds to not informed site type or farm category. **E**: RFLP type detected during year of 2019. **F**: RFLP type detected during year of 2018. RFLPs indicated as N/A represents not detected, or European PRRSV type.

SDRS Advisory Council highlights:

- The overall PRRSV percentage of positive cases in November is at 26.15%. It was 22.65% in October, with increased detection in all age categories;
  - The percentage of PCR-positive cases from wean-to-market increased for 4 consecutive months;
  - The percentage of PCR-positive cases from adult/sow farm increased for 2 consecutive months;
- Even though there is an increase in detection of PRRSV in the last 3 months, the detection during November 2019 is following the predicted increased PRRSV detection for this period of the year;
- The Advisory Council pointed out that the increased detection of PRRSV in wean-to-market animals may be signaling an increased risk for sow farms. People movements involving employees, maintenance, vistors, and feed or animal transportation should observe and comply with biosecurity measures to prevent further virus spread.

Topic 2 – Detection of enteric coronaviruses by RT-qPCR

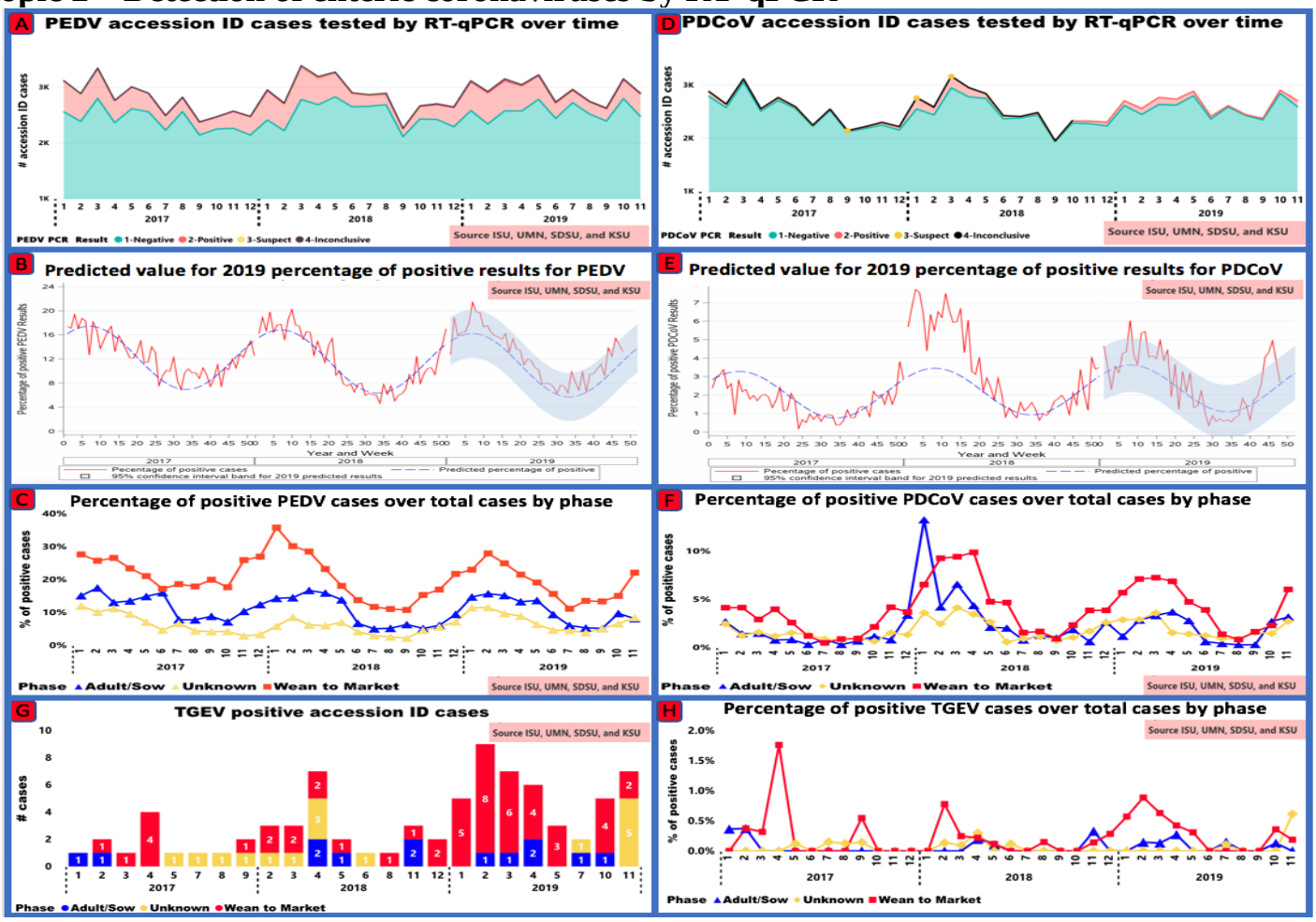

Figure 2. A: results of PEDV RT-qPCR cases over time. **B**: expected percentage of positive results for PEDV by RT-qPCR and 95% confidence interval for 2019 predicted value. **C:** percentage of PEDV PCR-positive results, by category over time. **D**: results of PDCoV RT-qPCR cases over time. **E**: expected percentage of positive results for PDCoV by RT-qPCR and 95% confidence interval for 2019 predicted value, based on weekly data observed in the previous 3 years. **F:** percentage of PDCoV PCR-positive results, by age category over time. **G**: number of PCR-positive accession ID results of TGEV by age category. **H**: percentage of PCR-positive results for TGEV by age category. Each color represents one distinct age category.

SDRS Advisory Council highlights:

- The overall PEDV percentage of positive cases in November was at 13.97% (404 of 2,891). It was 10.82% (342 of 3,151) in October;
    - The increased detection of PEDV RNA above expected during week 44 (October 27th to November 2nd) and 47 (November 17th to 23rd) was mostly driven by wean-to-market animals. In November the percentage of positive for wean-to-market animals was at 22.11% (262 of 1,185). It was 15.04% (191 of 1,270) in October;
- The overall PDCoV percentage of positive cases in November was at 4.18% (113 of 2,706). It was 2.13% (62 of 2,904) in October;
    - The increased detection of PDCoV RNA above expected during week 45 to 47 (November 3rd to 23rd) was mostly driven by wean-to-market animals. In November the percentage of positive for wean-to-market animals was at 6.04% (65 of 1,077). It was 2.30% (26 of 1,132) in October;
- There were 7 positive cases for TGEV RNA over a total of 2,635 cases tested in November. Positive cases were detected in IA, MN, and IN.

Topic 3 – Detection of MHP by PCR

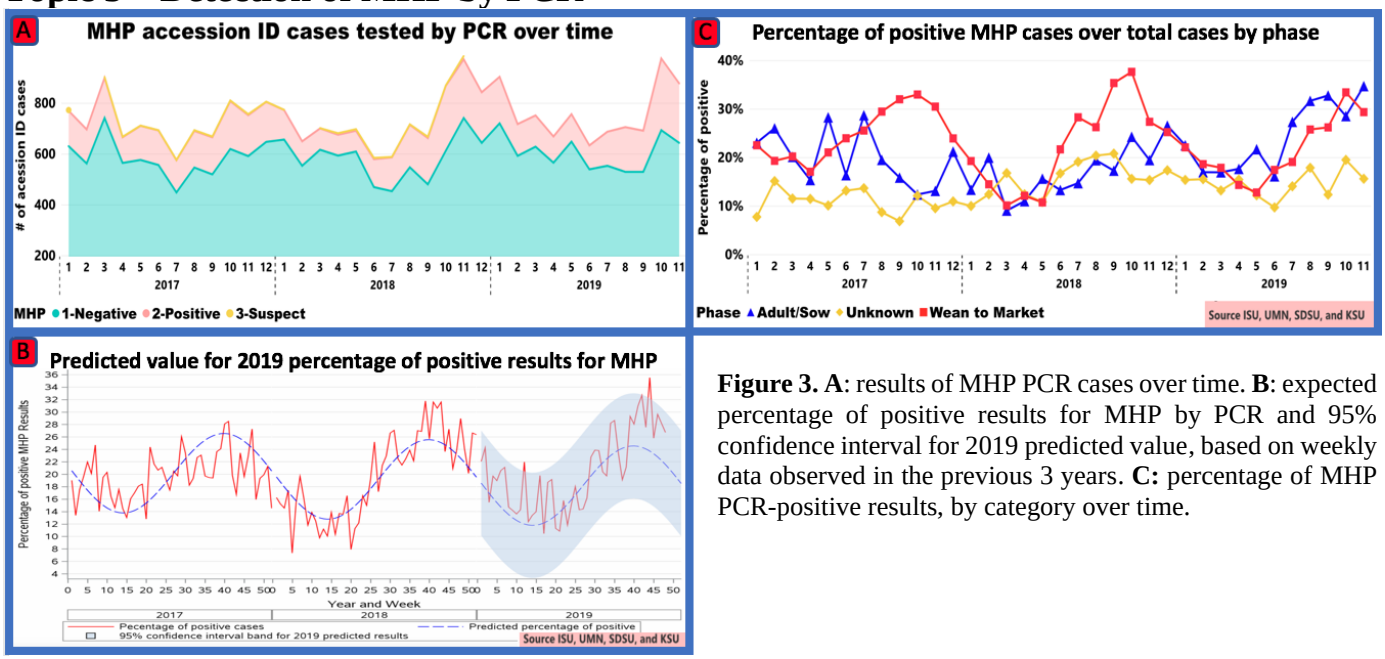

Figure 3. A: results of MHP PCR cases over time. **B**: expected percentage of positive results for MHP by PCR and 95% confidence interval for 2019 predicted value, based on weekly data observed in the previous 3 years. **C:** percentage of MHP PCR-positive results, by category over time.

SDRS Advisory Council highlights:

- There was a signal for increased detection of *M. hyopneumoniae* above the expected at week 44 (October 27th to November 2nd);
- The level of detection of *M. hyopneumoniae* during week 46 (November 3rd to 9th) for the age category adult/sow farm was at 47.37% (18 of 38), which was the weekly highest detection for this age category in the last 4 years.

Topic 4 – Disease diagnosis at ISU-VDL

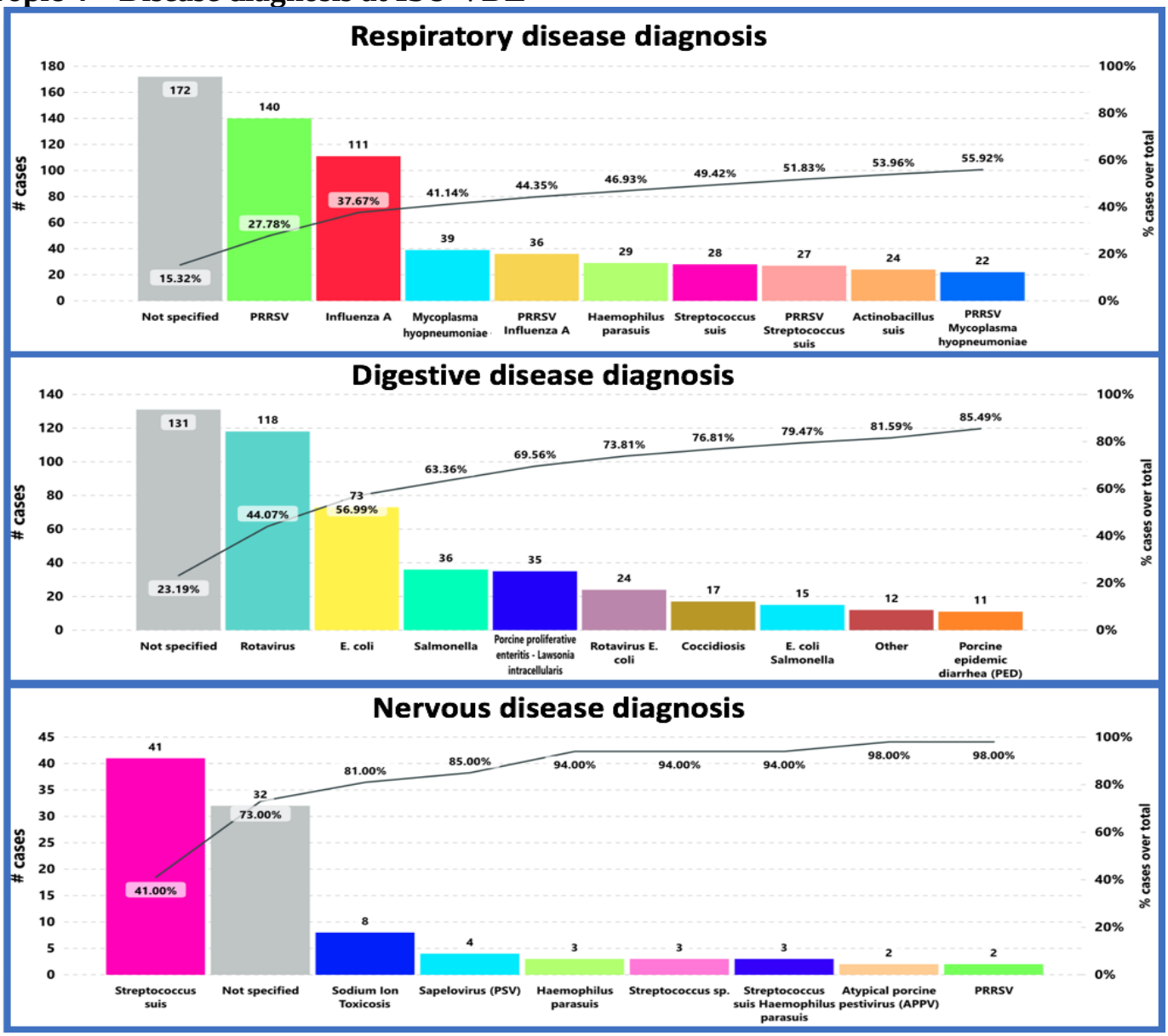

Figure 5. Most frequent disease diagnosis by physiologic system at ISU-VDL . Presented system is described in the title of the chart. Colors represent one agent and/or the combination of 2 or more agents. Only the physiologic systems with historic number of cases per season above 100 are presented in the report.

Note: Disease diagnosis takes one to two weeks to be performed. The graph and analysis contain data from October 1st to November 16th.

SDRS Advisory Council highlights:

- Among the cases submitted for diagnosis at ISU-VDL from October 1st to November 2nd there were signals for an increased number of cases diagnosed with PRRSV, Influenza A, *S. suis*, *P. multocida*, *M. hyopneumoniae*, and Rotavirus;
- The advisory council pointed out that there is an activity of the above-mentioned agents in different herds, some associated with relevant clinical signals. As a result, a more frequent monitoring to understand what is circulating in the herd may be contributing for an increased number of diagnosis for multiple agents.