**Swine Disease Reporting System
Report 20 (October 1 , 2019)**

What is the Swine Disease Reporting System (SDRS)?

SDRS includes multiple projects that aggregates 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 an 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, Douglas Marthaler, 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 percentage of positive cases from wean-to-market age category in September was at 35.52% (it was 33.05% in August);
  - The percentage of PCR-positive cases from wean-to-market increased for 2 consecutive months. This is accompanied by an increase in the total number of cases tested. The weekly average of cases tested for PRRSV during September was 376 compared with an average of 340 during August. The increase in the number of cases tested and the percentage of positive results are suggestive of increased PRRSV activity in the wean-to-market age category;
  - Cooler nights during the end of August and during September have been pointed by the advisory council as a contributor factor for the recent increase in detection of wean-to-market animals.
- Percentage of positive results in the age adult/sow farm is at 16.31%, which is 1.24% lower compared with August and the lowest for the year of 2018/2019;
- RFLP 2-5-2 continues to be the most prevalent type, followed by 1-7-4 and 1-8-4.

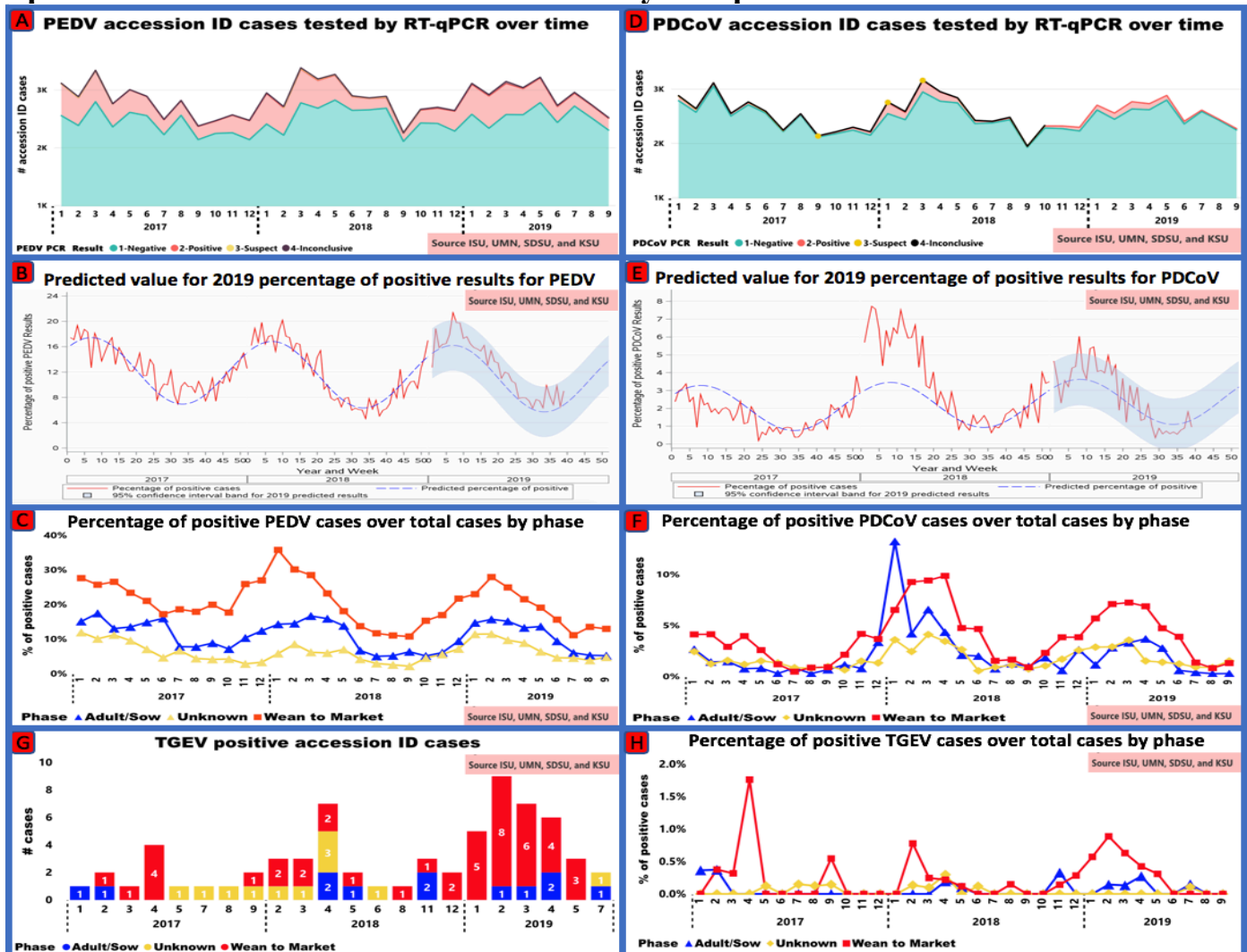## Topic 2 – Detection of enteric coronaviruses by RT-qPCR

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 level of detection of PEDV RNA during September for the age category wean-to-market was at 12.98%, which was similar to August (13.55%);
- The level of detection of PEDV during September in adult/sow farms is 5.24%, the historical lowest since PEDV entered the US;
- The overall level of detection of PDCoV RNA was within the expected values for September;
- The level of detection of PDCoV for the age category wean-to-market increased from 0.83% in August to 1.32% in September;
- There were no positive cases for TGEV over a total of 2,214 cases tested in September;
- During 2018/2019, sow herds enrolled in programs to control/eliminate PRRSV may have had concomitantly eliminated other pathogens including PEDV/PDCoV, contributing for the lower level of detection of this agent in the age category of adult/sows.

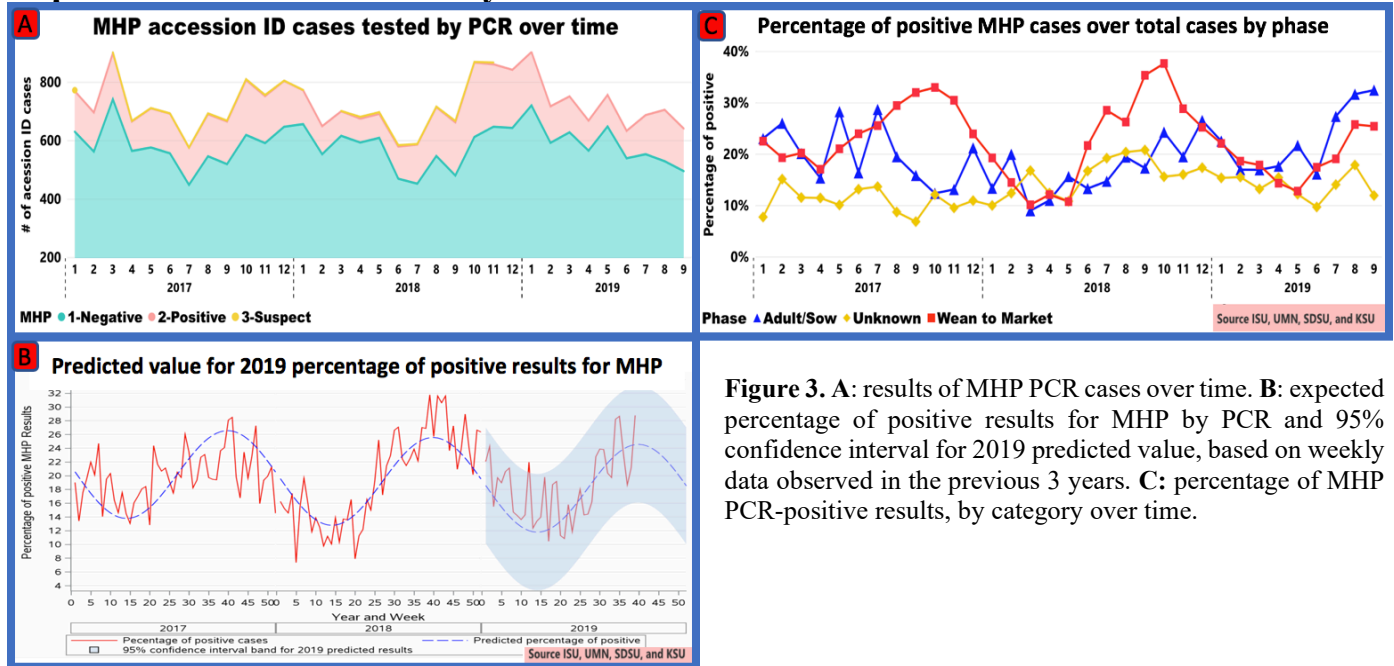## Topic 3 – Detection of MHP by PCR

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:

- The level of detection of *Mycoplasma hyopneumoniae* in the age category of adult/sows was 32.5% in August. This level of detection was the highest monthly level of detection for this agent in this category during the last 3 years.

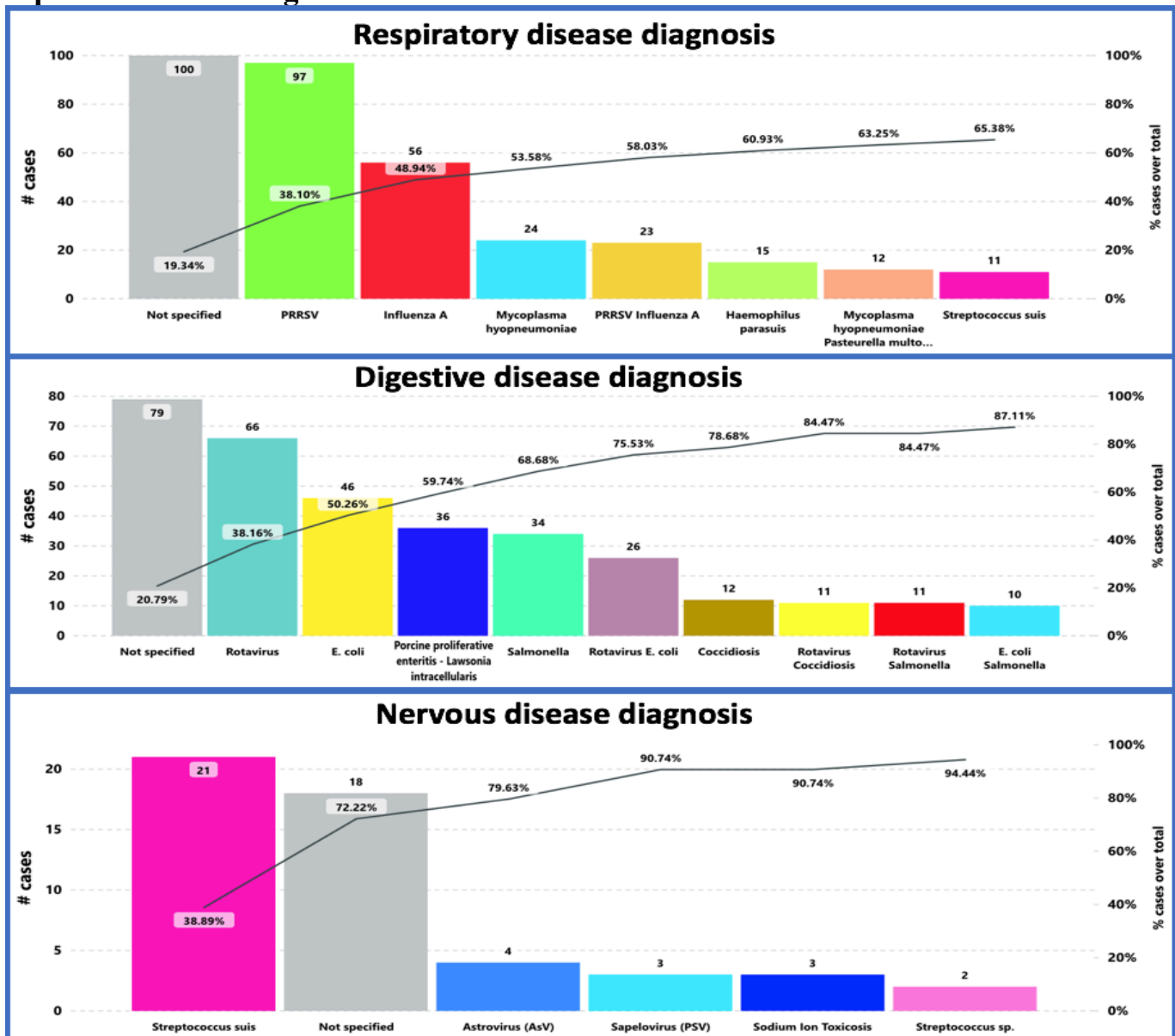## Topic 4 – Disease diagnosis at ISU-VDL

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. Information for other systems can be accessed online at www.fieldepi.org/diagnosis

Note: Disease diagnosis takes one to two weeks to be performed. The graph and analysis contains data from August 1st to September 15th .

SDRS Advisory Council highlights:
- Among the cases submitted for diagnosis at ISU-VDL during August 1st to September 15th there was a signal for increased number of cases diagnosed with the presence of the endemic agents PRRSV, Influenza virus A, *Streptococcus suis*, *Pasteurella multocida, and Mycoplasma hyopneumoniae*;
- According to the advisory council, these findings are aligned with observed increased activity of these agents around this time of year. Swings in weather temperature and submission as an attempt to diagnose and/or obtain strain isolates for vaccine purposes have been pointed out as contributors for this increased detection.