

Swine Disease Reporting System

Report # 31 (September 1, 2020)

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 (USA), 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 in making 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 an interpretation of the observed data, and summarize the implications to the industry. Major findings are also discussed in monthly podcasts. All SDRS reports and podcasts are available at www.fieldepi.org/SDRS. The SDRS projects are:

Swine Health Information Center (SHIC)-funded Domestic Swine Disease Surveillance Program: collaborative project among multiple VDLs, with the goal to aggregate swine diagnostic data and report in an intuitive format (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, Pablo Pineyro, Christopher Siepker; Rodger Main, Daniel Linhares.

Project coordinator [Giovani Trevisan](#). Principal investigator [Daniel Linhares](#).

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

Kansas State University: Rob McGaughey, Eric Herrman, Roman Pogranichniy, Rachel Palinski, Jamie Henningson.

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

Disease Diagnosis System: A pilot program with the ISU-VDL consisting of reporting disease detection (not just pathogen detection by PCR), based on diagnostic codes assigned by veterinary diagnosticians.

FLUture: Aggregates influenza A virus (IAV) diagnostic data from the ISU-VDL and reports results, metadata, and sequences.

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

Audio and video reports: Key findings from SDRS projects are summarized monthly in a conversation between investigators, and available in the form of an ‘audio report’, and “video report” through [SwineCast](#), [YouTube](#), [LinkedIn](#), and the [SDRS webpage](#).

Advisory Group: Reviews and discusses the data, providing their comments and perspectives on a monthly: Clayton Johnson, Emily Byers, Mark Schwartz, Paul Sundberg, Paul Yeske, Rebecca Robbins, Tara Donovan, Deborah Murray, Scott Dee, Melissa Hensch, Scanlon Daniels.

In addition to this report, interactive dashboards with aggregated test results are available at www.fieldepi.org/SDRS.

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

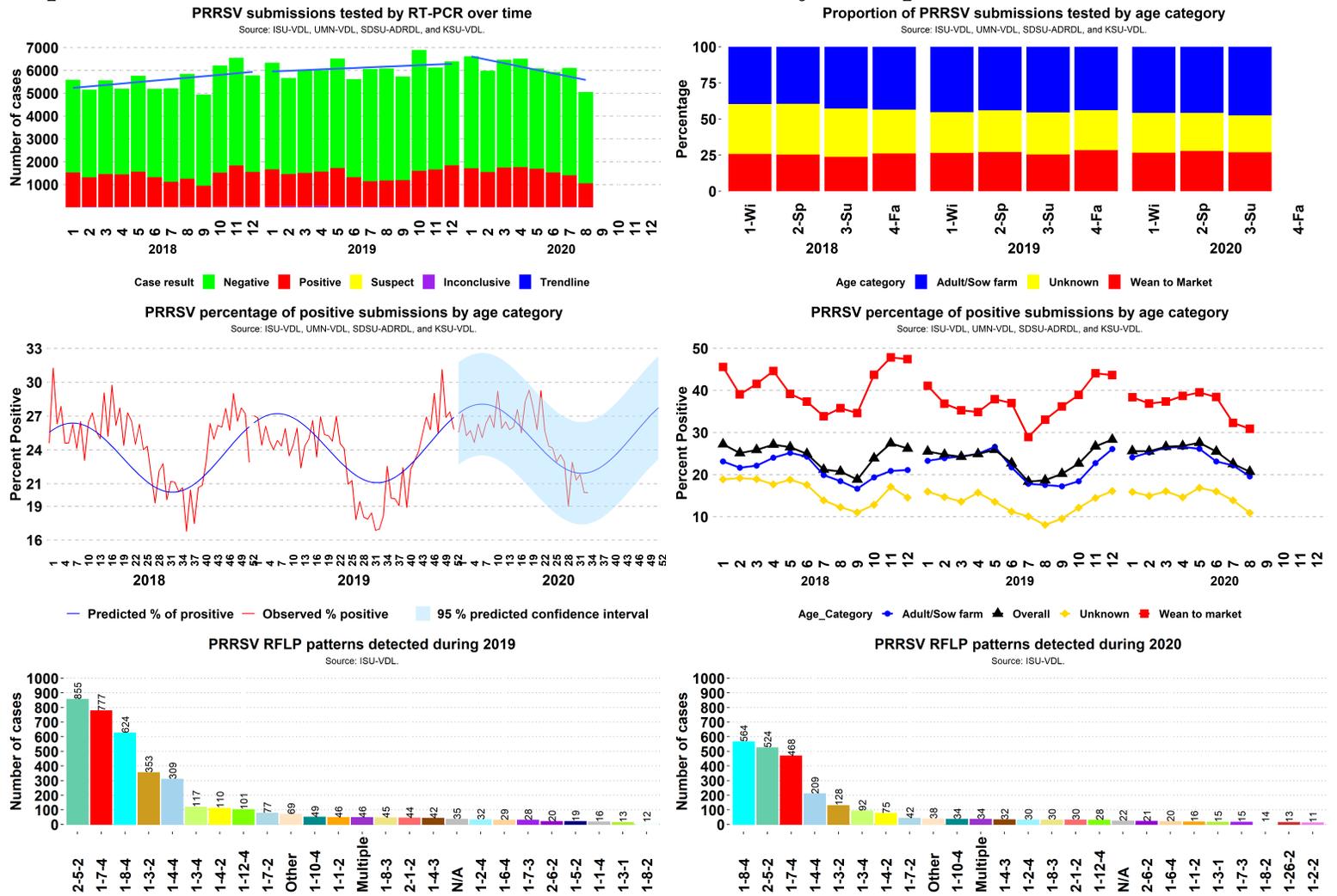


Figure 1. Top: left: Results of PRRSV RT-PCR cases over time. Right: expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on weekly data observed in the previous 3 years and season. Middle: Left Proportion of accession ID cases tested for PRRSV by age group per year and season. Right: percentage of PRRSV 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. Bottom: The 25 most frequently detected RFLP patterns left year of 2019; right year of 2020. RFLPs indicated as N/A represents not detected, or European PRRSV.

SDRS Advisory Group highlights:

- Overall, 20.71% of 5,056 cases tested PRRSV-positive in August, similar to 22.56% of 6,112 in July;
 - Positivity in adult/sow category in August was 19.57% (496 of 2,534), a moderate decrease from 22.2% (641 of 2,887) in July;
 - Positivity in wean-to-market category in August was 30.89% (426 of 1,379), similar to 32.3% (509 of 1,576) in July;
- Overall PRRSV-percentage of positive cases was above 3 standard deviations from state-specific baselines in MO;
- The advisory group pointed out that the decreased PRRSV detection for this time of the year is following field observations.

Topic 2 – Detection of RNA of enteric coronavirus by RT-qPCR

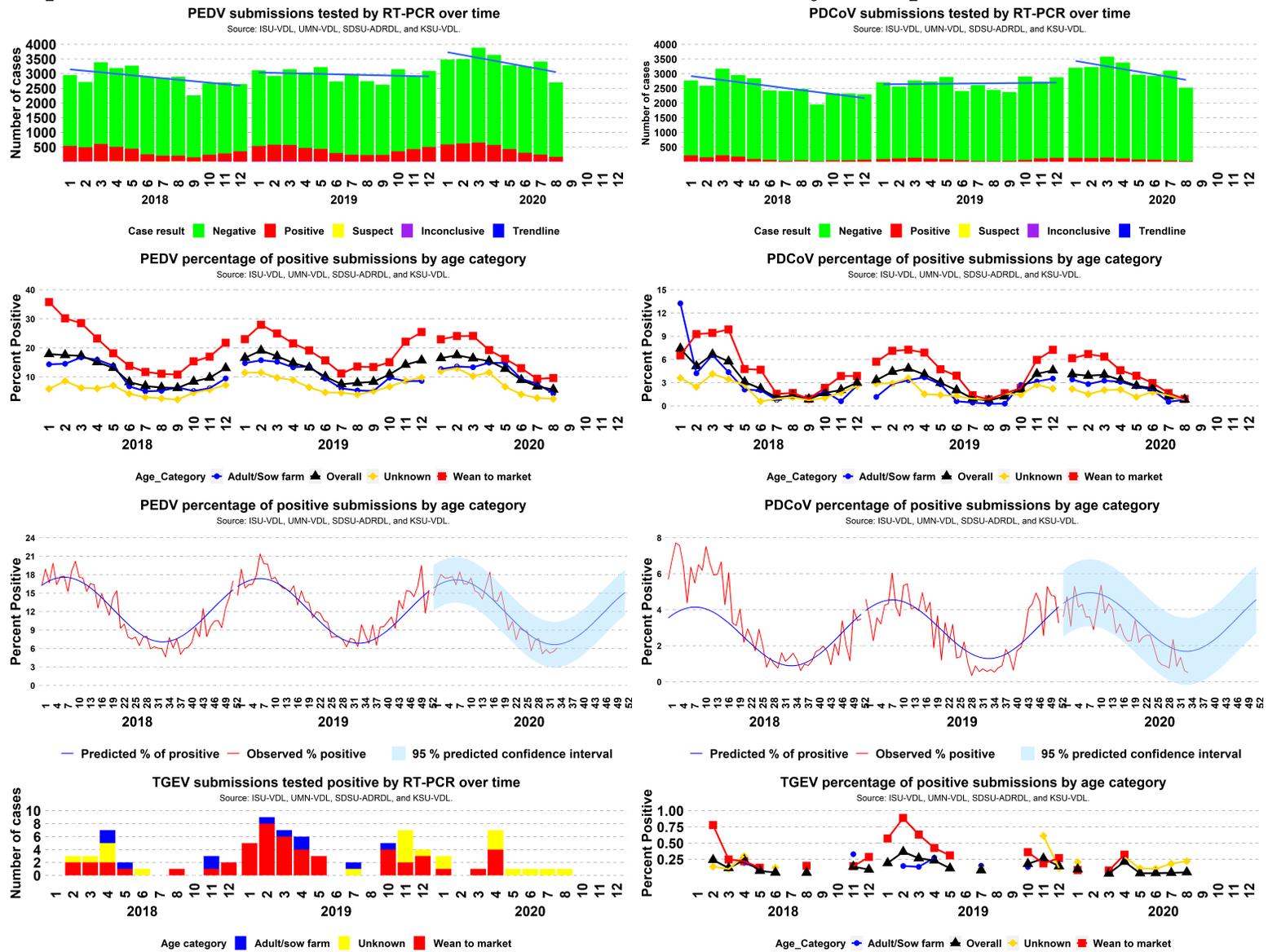


Figure 2. Top: left PEDV right PDCoV cases tested by RT-PCR over time. Second from top: B:left PEDV right PDCoV percentage of PCR-positive results, by age category over time. Second from bottom: left PEDV right PDCoV expected percentage of positive results for cases tested by RT-qPCR and 95% confidence interval for 2020 predicted value. Bottom: left number of TGEV positive cases by age category right percentage of TGEV PCR-positive cases by age category. Each color represents one distinct age category.

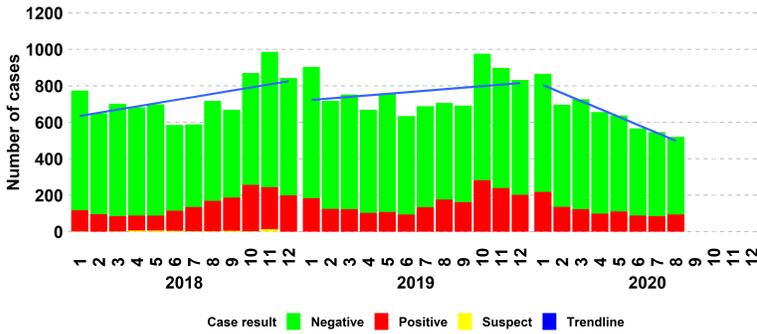
SDRS Advisory Group highlights:

- Overall, 5.66% of 2,705 cases tested PEDV-positive in August, similar to 6.72% of 3,410 in July;
 - The overall detection was within the expected boundaries of the forecasted levels for this time of the year;
 - Positivity in adult/sow category in August was 4.32% (35 of 810), a moderate decrease from 7.57% (78 of 1,030) in July;
 - Positivity in wean-to-market category in August was 9.6% (96 of 1,000), similar to 9.33% (121 of 1,297) in July;
 - Overall PEDV-percentage of positive cases was within or below baseline level for all 11 monitored states;
- Overall, 0.83% of 2,524 cases tested PDCoV-positive in August, similar to 1.22% of 3,105 in July;
 - The overall detection was within the expected boundaries of the forecasted levels for this time of the year;
 - Positivity in adult/sow category in August was 0.79% (6 of 761), similar to 0.54% (5 of 928) in July;
 - Positivity in wean-to-market category in August was 0.89% (8 of 897), similar to 1.66% (19 of 1,147) in July;
 - Overall PDCoV-percentage of positive cases was within or below baseline level for all 10 monitored states;
- There was 1 positive case for TGEV RNA in August 2020 over a total of 2,064 cases tested;
- The advisory group pointed out that the decreased enteric coronavirus detection for this time is according to the expected and advice to closely monitor animal health as we enter a transitory period for the expected increase in the detection of these agents.

Topic 3 – Detection of *Mycoplasma hyopneumoniae* (MHP) DNA by PCR.

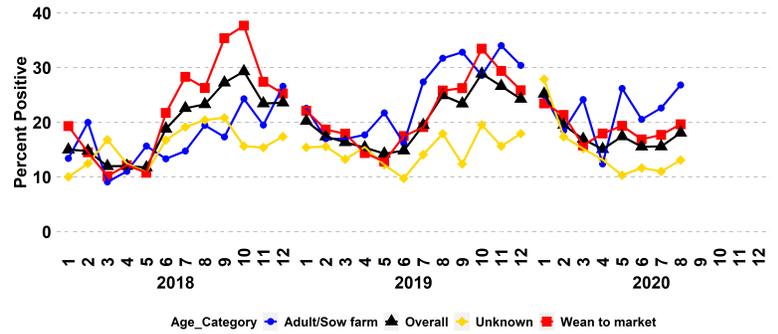
Mycoplasma hyopneumoniae submissions tested by RT-PCR over time

Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.



Mycoplasma hyopneumoniae percentage of positive submissions by age category

Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.



Mycoplasma hyopneumoniae percentage of positive submissions by age category

Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.

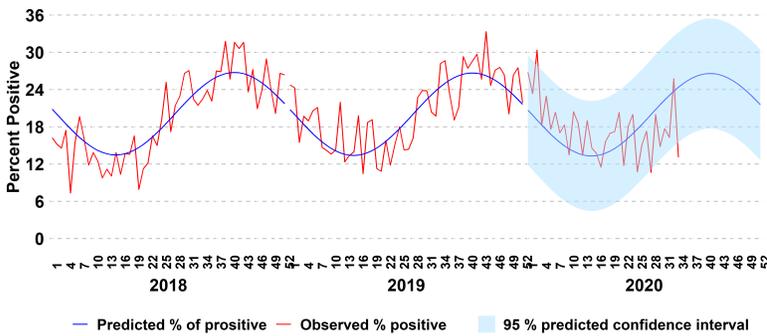


Figure 3. *Left top:* results of MHP PCR cases over time. *Right top:* expected percentage of positive results for MHP by PCR and 95% confidence interval for 2020 predicted value, based on weekly data observed in the previous 3 years. *Bottom:* percentage of MHP PCR-positive results, by category over time.

SDRS Advisory Group highlights:

- Overall, 18.08% of 520 cases tested *Mycoplasma hyopneumoniae*-positive cases in August, a moderate increase from 15.57% of 546 in July;
- As expected the observed overall detection of *Mycoplasma hyopneumoniae*-positive cases is following the forecasted expected increase in the levels of detection for this time of the year.

Topic 4 – Disease diagnosis at the ISU-VDL.

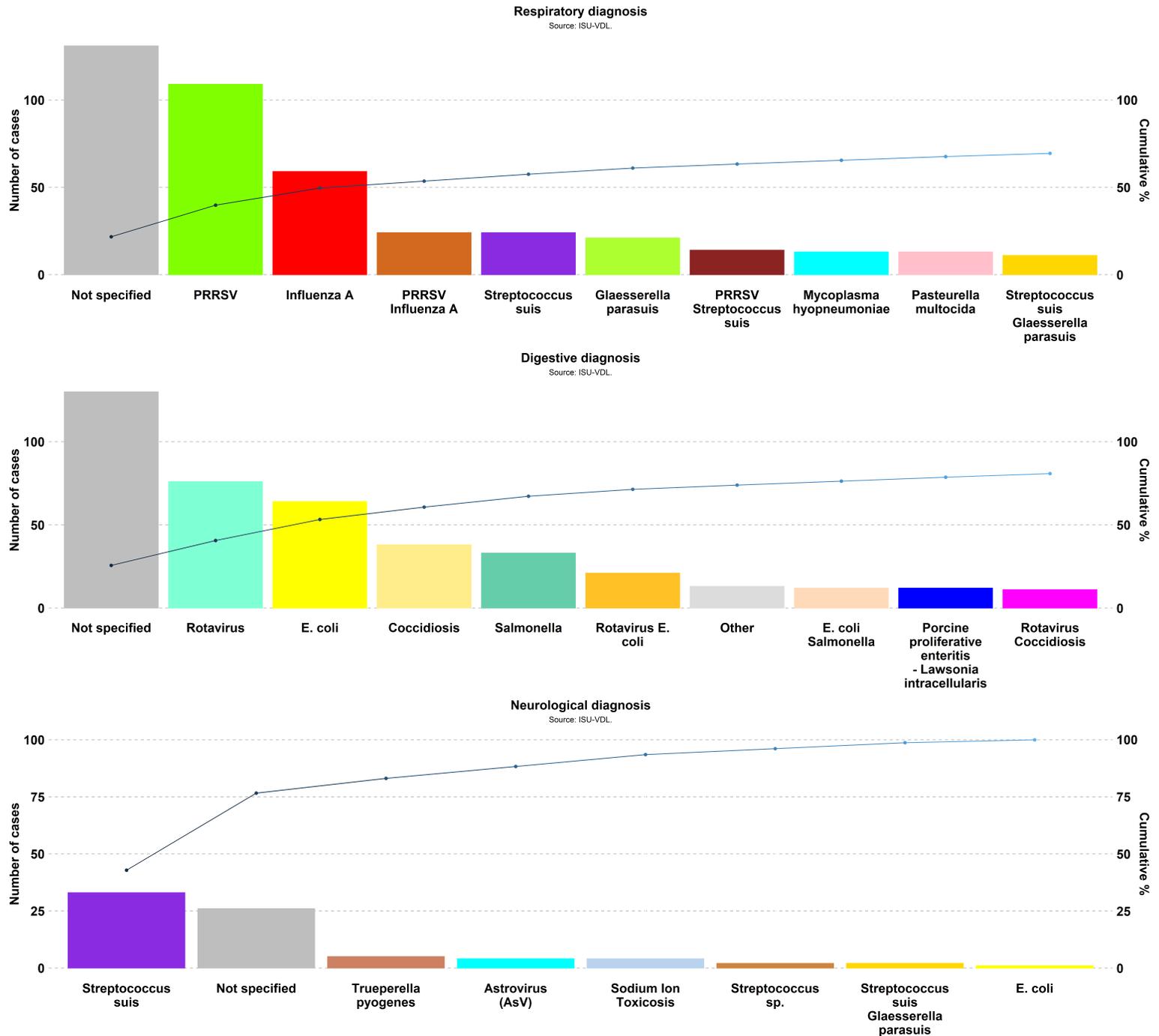


Figure 4. Most frequent disease diagnosis by physiologic system at ISU-VDL . Presented system is described in the title of the chart. Colors represent one agent and/or the combination of 2 or more agents. Only the physiologic systems with historic number of cases per season above 100 are presented in the report.

Note: Disease diagnosis takes one to two weeks to be performed. The graphs and analysis contain data from July 1 to August 16.

SDRS Advisory Group highlights:

- After Not specified (131 of 603), PRRSV (109 of 603) continues to lead the number of respiratory diagnoses. After Not specified (130 of 507), Rotavirus (76 of 507) leads the digestive diagnoses, and *Streptococcus suis* (33 of 77) the neurological diagnosis;
- During July 12 to 18, there was a significant increase (signal) in digestive diagnosis;
- During July 12 to 25, there was a significant increase (signal) in diagnosis of *E. coli*;
- Even though there were a restricted number of cases with Clostridiosis diagnosis there was a signal between July 19 to August 15;
- Even though there were a restricted number of cases with Mulberry Heart Disease diagnosis there was a signal between July 12 to August 8.