

Swine Disease Reporting System Report 24 (February 4, 2020)

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 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, Giselle Cino, 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 a video report through SwineCast, YouTube, and the SDRS webpage (link below).

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.

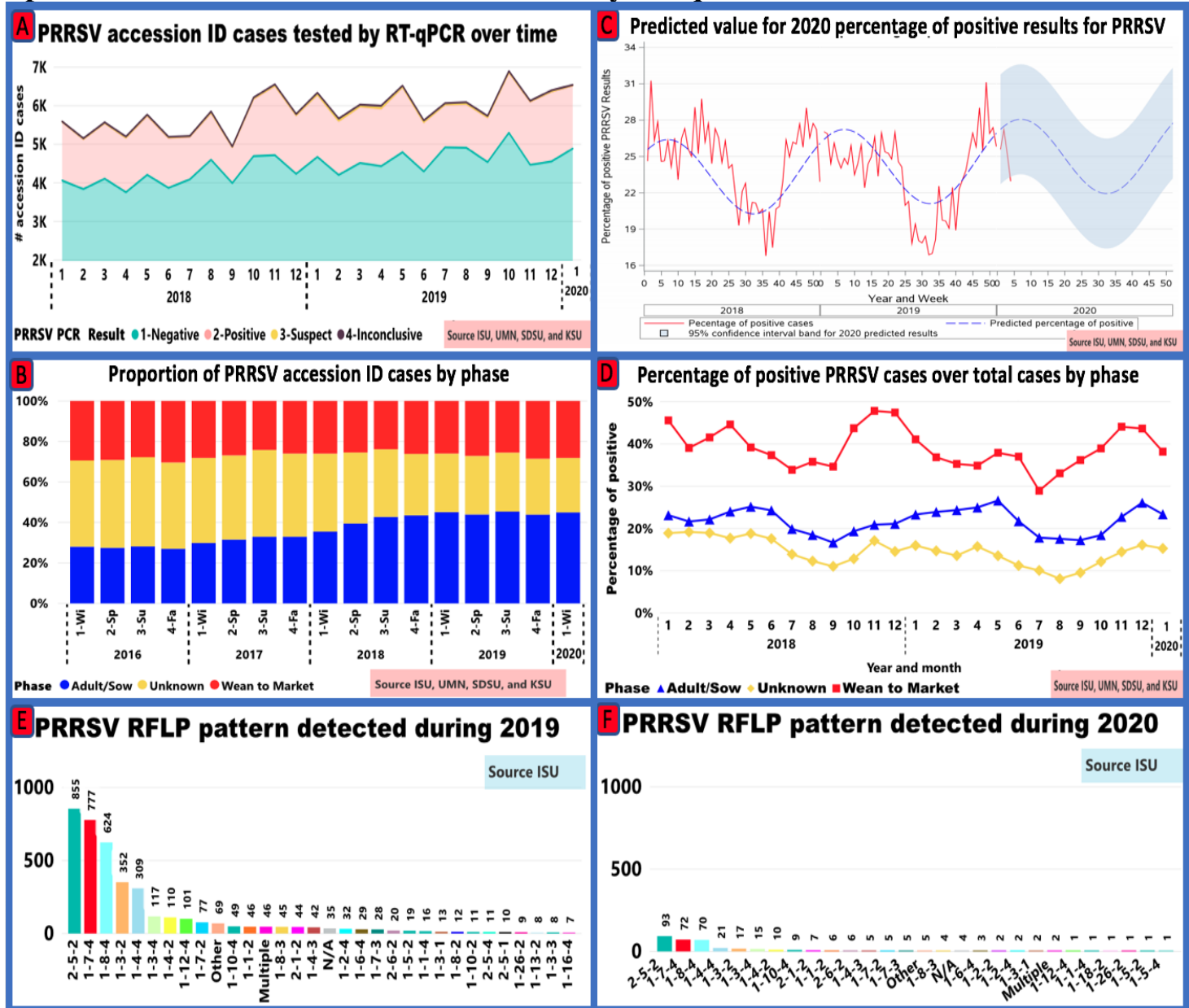


Figure 1. A: Results of PRRS RT-qPCR cases over time. B: Proportion of accession ID cases tested for PRRSV by age group per year and season. C: expected percentage of positive results for PRRSV RNA by RT-qPCR, with 95% confidence interval band for predicted results based on weekly data observed in the 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 2020. RFLPs indicated as N/A represents not detected, or European PRRSV type.

SDRS Advisory Council highlights:

- The overall percentage of PRRS positive cases in January was 25.02% (1,636 of 6,539), decreasing from 27.66% (1,743 of 6,302) in December. The decline in the percentage of PCR positive cases happened in all age groups and sample types;
- The most prevalent RFLP patterns detected in January 2020 were the same as the ones reported last year;
- The advisory Council pointed out that the decline in percent positive cases is in agreement with Morrison's Swine Health Monitoring Program (MSHMP), which reports a relatively low PRRS incidence in sow farms compared to previous years.



Topic 2 – Detection of enteric coronaviruses by RT-qPCR

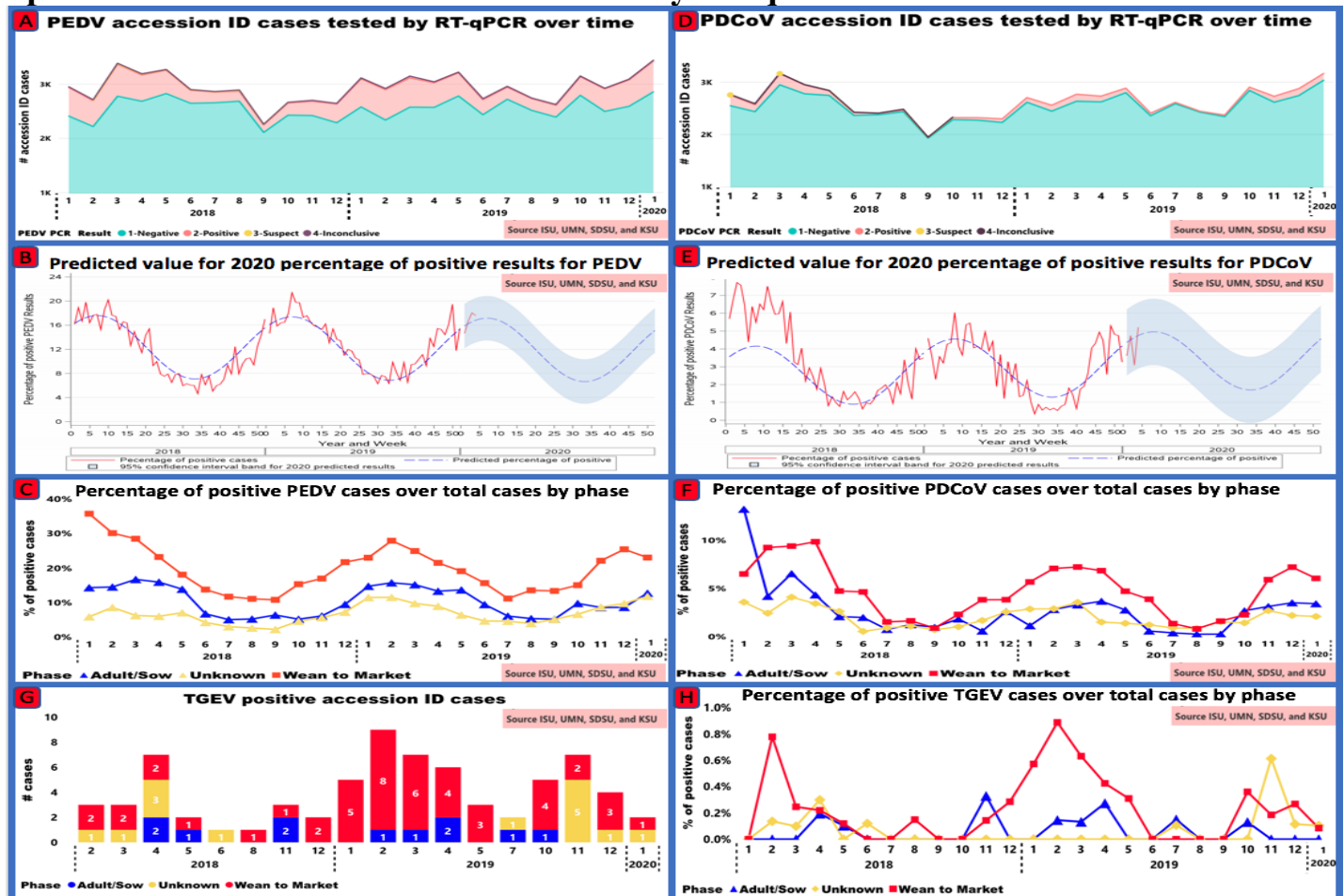


Figure 2. A: results of PEDV RT-qPCR cases over time. B: expected percentage of positive results for PEDV by RT-qPCR and 95% confidence interval for 2020 predicted value. C: percentage of PEDV PCR-positive results, by category over time. D: results of PDCoV RT-qPCR cases over time. E: expected percentage of positive results for PDCoV by RT-qPCR and 95% confidence interval for 2020 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 percentage of PEDV RNA positive cases in January was 16.48% (567 of 3,441), slightly up from 15.64% (483 of 3,089) in December;
 - The percentage of PEDV RNA positive cases for the adult/sow farm cases in January was 12.72% (130 of 1,022), up from 8.59% (77 of 896) in December;
 - The percentage of PEDV RNA positive cases for the wean to market animals was 22.83% (310 of 1,344), decreasing from 25.46% (316 of 1,241) in December;
 - Increased detection of PEDV was observed in cases from MN and NC.
- The overall percentage of PDCoV positive cases in January 4.32% (128 of 3,165), slightly down from 4.59% (132 of 2,835) in December;
 - The percentage of PDCoV RNA positive cases from wean to market animals was 6.08% (74 of 1,218), decreasing from 7.24% (82 of 1,132) in December;
- PEDV and PDCoV RNA positive cases are both within the forecasted levels for this time of the year;
- There were two positive cases for TGEV RNA (from OK and IA) over a total of 3,078 cases tested in January;
- The Advisory Council pointed out that increased enteric coronaviruses testing for surveillance testing have been performed in the recent months for better monitoring of these pathogens.

Topic 3 – Detection of MHP by PCR

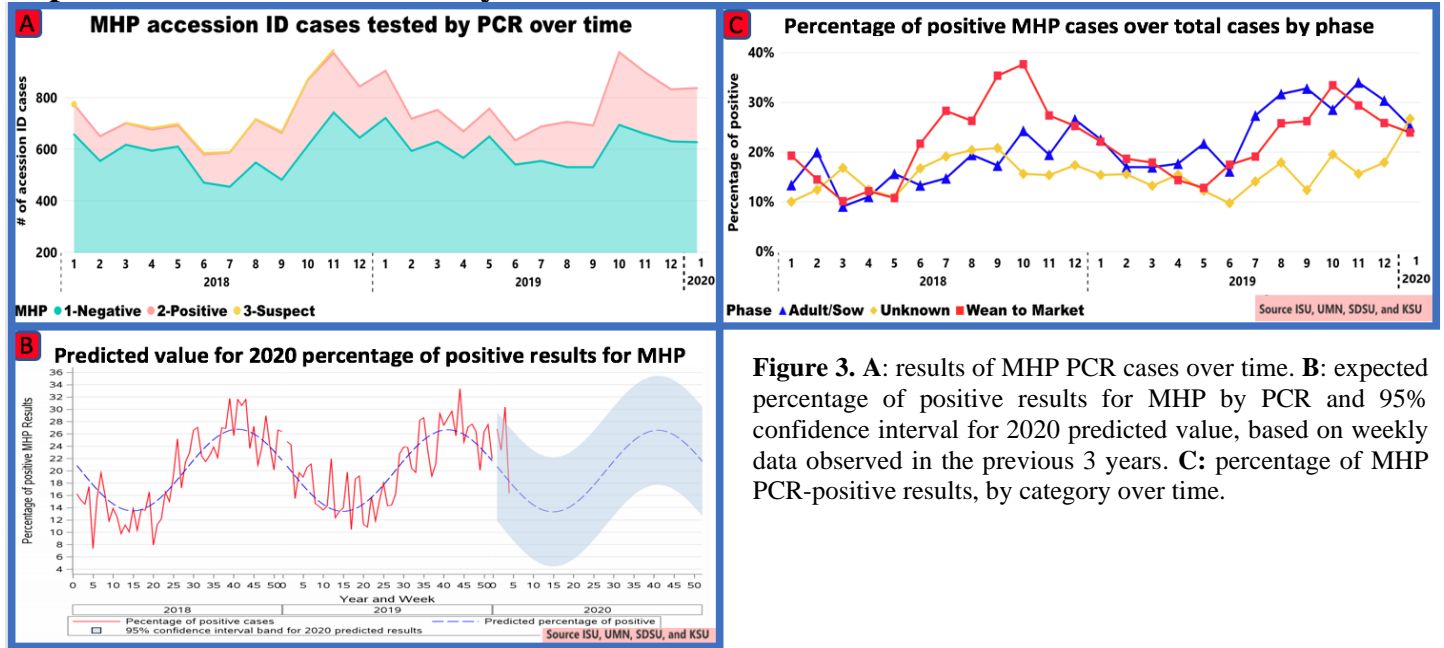


Figure 3. A: results of MHP PCR cases over time. **B:** expected percentage of positive results for MHP by PCR and 95% confidence interval for 2020 predicted value, based on weekly data observed in the previous 3 years. **C:** percentage of MHP PCR-positive results, by category over time.

SDRS Advisory Council highlights:

- The overall percentage of *Mycoplasma hyopneumoniae* positive cases in January was 25.09% (210 of 837), slightly up from 24.28% (202 of 832) in December, mostly driven by samples with unknown information for age category;
- The Advisory Council pointed out that better diagnostic tools and sampling techniques are potential contributors for the overall increased detection observed after the second half of 2019.

Topic 4 – Disease diagnosis at ISU-VDL

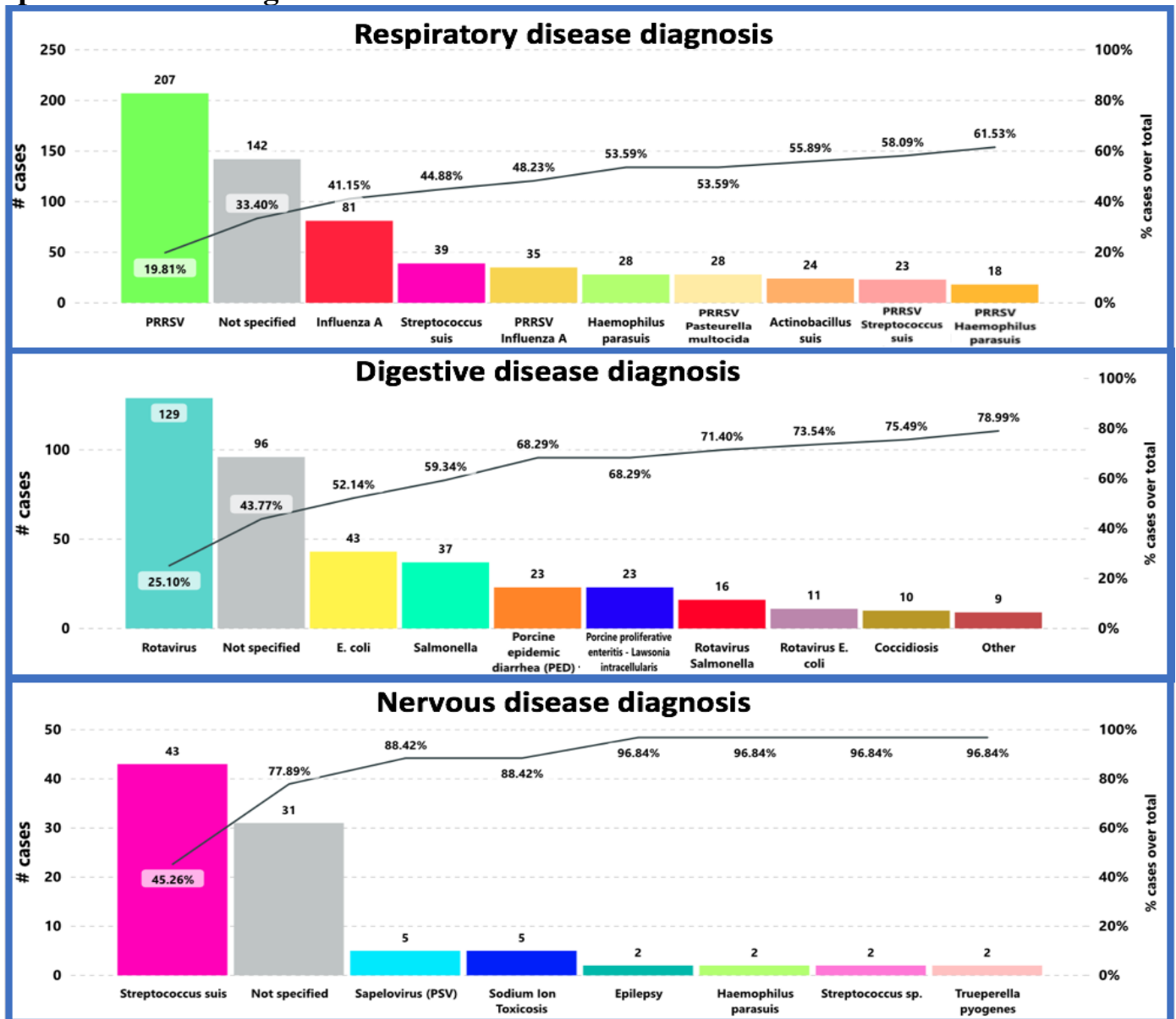


Figure 5. Most frequent disease diagnosis by physiologic system at ISU-VDL . Presented system is described in the title of the chart. Colors represent one agent and/or the combination of 2 or more agents. Only the physiologic systems with historic number of cases per season above 100 are presented in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

Note: Disease diagnosis takes one to two weeks to be performed. The graph and analysis contains data from December 1 to January 18.

SDRS Advisory Council highlights:

- Among the cases submitted for diagnosis at ISU-VDL from December 1 to January 18 there were no signals for increased number diagnoses for a specific agent;
- PRRSV (n=207) continues to lead the number of respiratory diagnosis, rotavirus (n=129) the enteric diagnosis, and *S.suis* (n=43) the nervous diagnosis.