# Swine Disease Reporting System
# Report # 29 (July 7, 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.

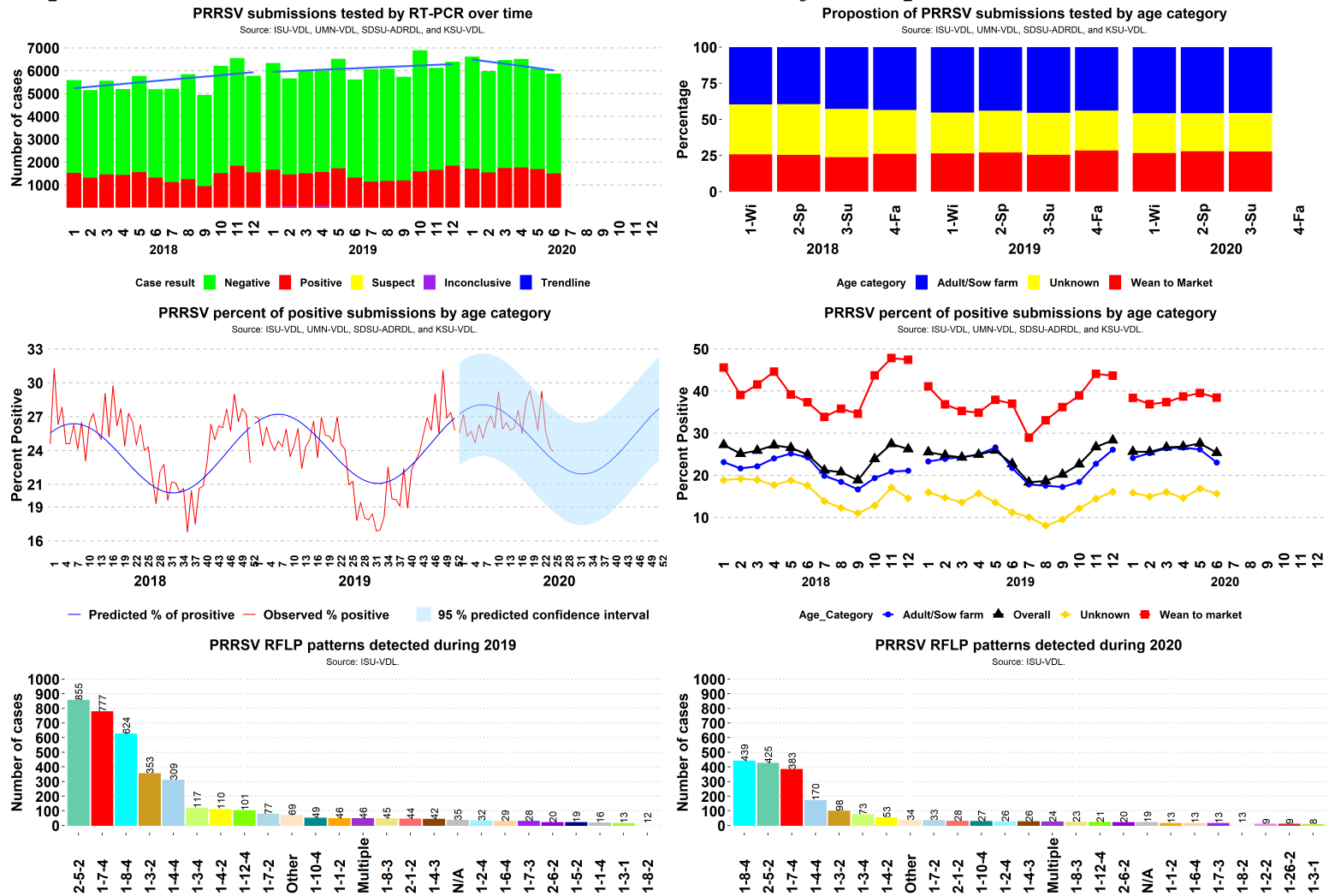# Topic 1 – Detection of PRRSV RNA over time by RT-qPCR.



**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. **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:

• The overall percentage of PRRSV-positive cases in June was 25.34% (1,489 of 5,875), decreasing from 27.55% (1,678 of 6,090) in May;

    • Positivity in adult/sow category in June was 23.03% (617 of 2,679), decreasing from 26.15% (728 of 2,784) in May;

    • Positivity in wean-to-market category in June was 38.42% (627 of 1,632), decreasing from 39.54% (686 of 1,735) in May;

• The overall detection of PRRSV-positive cases was the upper boundaries of the forecasted levels for the first three weeks of June, mostly contributed by increased detection in in wean-to-market category;

• Overall PRRSV-percentage of positive cases was above 3 standard deviations from state-specific baselines in MN, SD, and IN;

• There was no change in the distribution of RFLP patterns detected from May to June;

• The advisory group pointed out that the increased detection observed in early June is very likely to be associated with downstream detection in piglets coming from farms that broke with PRRSV earlier this past winter. Retention of marketing animals in the field has lead to some undesired commingling strategies facilitating wean-to-market cross-contamination. Furthermore, the advisory group reminds of the need for continued education and reminding people about the need to comply with biosecurity and biocontainment practices, especially related to farm entry procedures, people, animals, and feed movements. Additionally, this group is optimistic that processing plants will continue returning to its regular activity in the upcoming months helping in the farms to return to its regular activities.

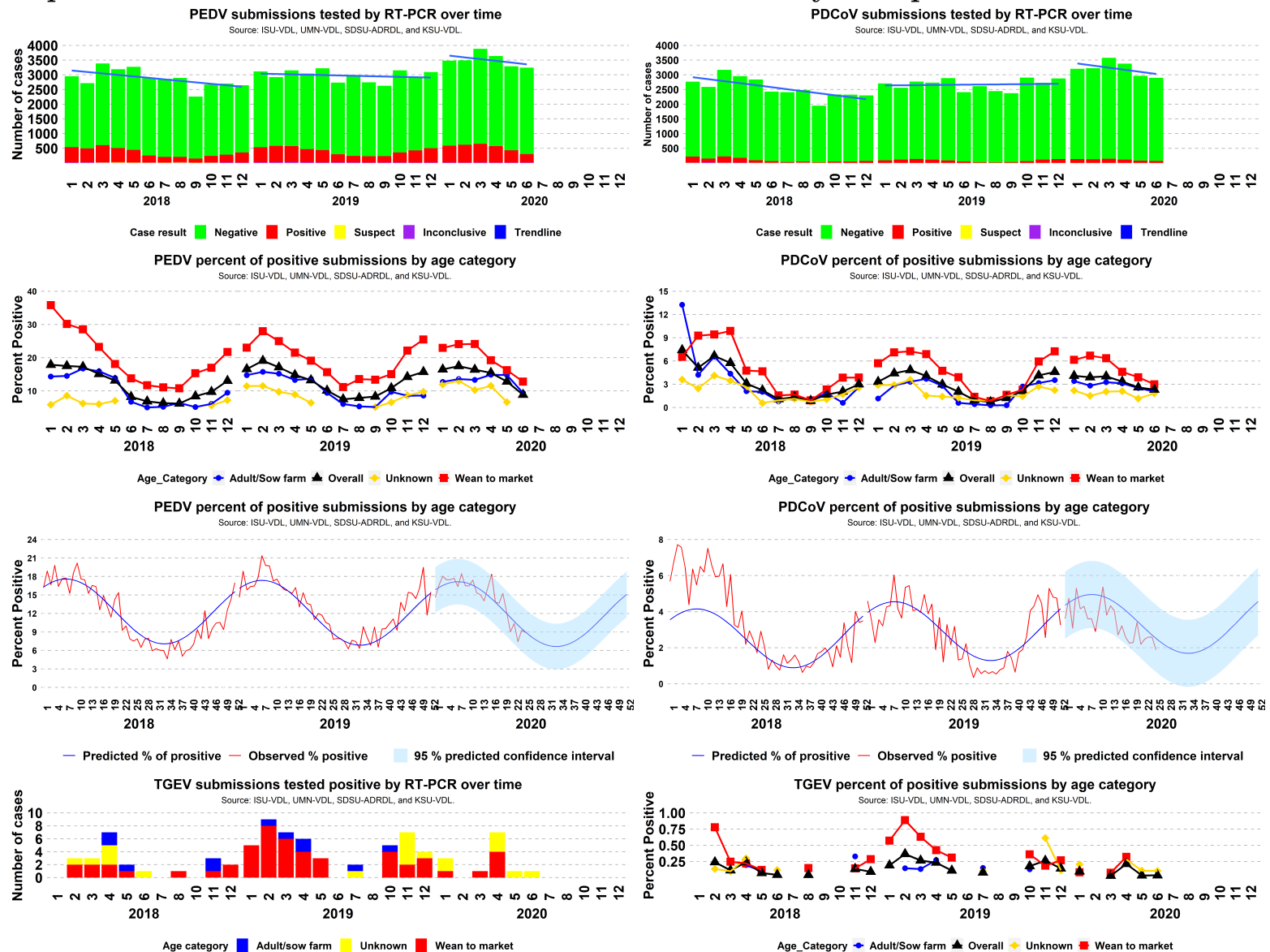# Topic 2 – Detection of RNA of enteric coronavirus by RT-qPCR



**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:

- The overall percentage of PEDV RNA-positive cases in June was 8.91% (287 of 3,220), decreasing from 12.67% (416 of 3,284) in May;

  - Positivity in adult/sow category in June was 9.41% (75 of 786), decreasing from 14.78% (158 of 1,069) in May;
  - Positivity in wean-to-market category in June was 12.89% (110 of 909), decreasing from 16.24% (196 of 1,207) in May;

- Overall PEDV-percentage of positive cases was within or below baseline level for all 11 monitored states;
- The overall detection of PEDV-positive cases was within the expected boundaries of the forecasted levels for this time of the year;
- The overall percentage of PDCoV-positive cases in June was 2.31% (67 of 2,899), slightly decreasing from 2.60% (77 of 2,964) in May;
- The overall detection of PDCoV-positive cases was within the expected boundaries of the forecasted levels for this time of the year;
- Overall PDCoV-percentage of positive cases was above 3 standard deviations from state-specific baselines in NC;
- There was 1 positive case for TGEV RNA in June 2020 over a total of 2,818 cases tested;
- The advisory group highlighted that the decreased detection of PEDV and PDCoV RNA in June is aligned with the summer expected seasonal decrease in the number of cases submitted for testing. Additional economic contingency amid the COVID-19 situation may have contributed to lowering some testing strategies.

IOWA STATE UNIVERSITY — Veterinary Diagnostic Laboratory

UNIVERSITY OF MINNESOTA — VETERINARY DIAGNOSTIC LAB

SOUTH DAKOTA ADRDL — ANIMAL DISEASE RESEARCH & DIAGNOSTIC LABORATORY — BROOKINGS, SOUTH DAKOTA

Kansas State Veterinary DIAGNOSTIC LABORATORY

SHIC — Swine Health Information Center

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



**Mycoplama hyopneumoniae submissions tested by RT-PCR over time**
Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.
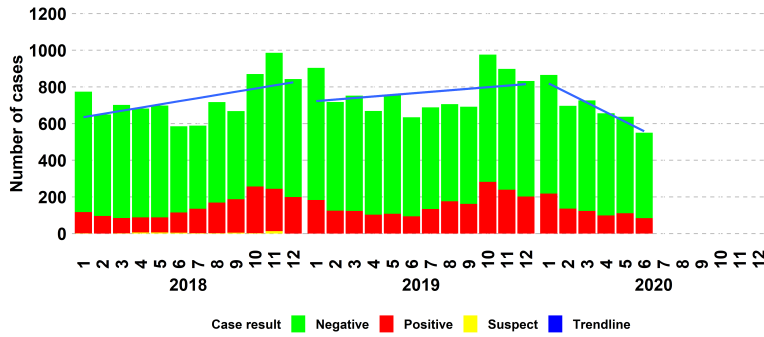
Case result: Negative, Positive, Suspect, Trendline



**Mycoplasma hyopneumoniae percent of positive submissions by age category**
Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.

Age_Category: Adult/Sow farm, Overall, Unknown, Wean to market



**Mycoplasma hyopneumoniae percent of positive submissions by age category**
Source: ISU-VDL, UMN-VDL, SDSU-ADRDL, and KSU-VDL.
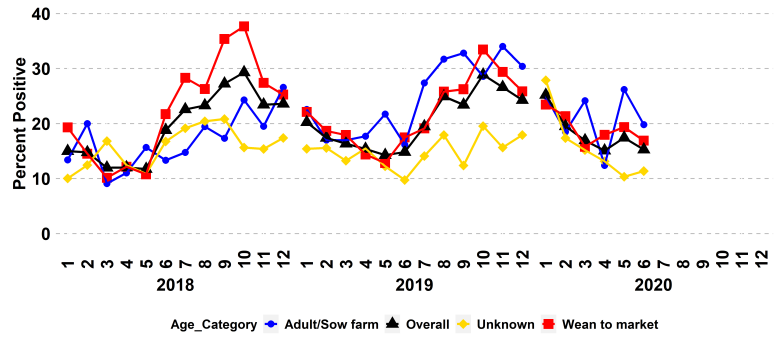
Predicted % of prositive — Observed % positive — 95 % predicted confidence interval
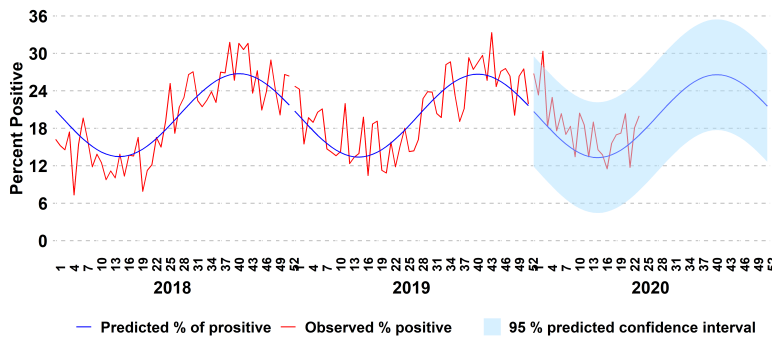
**Figure 3.** *Left top*: results of MHP PCR cases over time. *Right top*: expected percentage of positive results for MHP by PCR and 95% confidence interval for 2020 predicted value, based on weekly data observed in the previous 3 years. *Bottom*: percentage of MHP PCR-positive results, by category over time.

## SDRS Advisory Group highlights:

- The overall percentage of *Mycoplasma hyopneumoniae*-positive cases in June was within the forecasted levels, at 15.27% (84 of 550), down from 17.43% (111 of 637) in May;
- The overall detection of *Mycoplasma hyopneumoniae*-positive cases is within the expected boundaries of the forecasted levels for this time of the year.

# Topic 4 – Disease diagnosis at the ISU-VDL.

### Respiratory diagnosis
Source: ISU-VDL.



### Digestive diagnosis
Source: ISU-VDL.



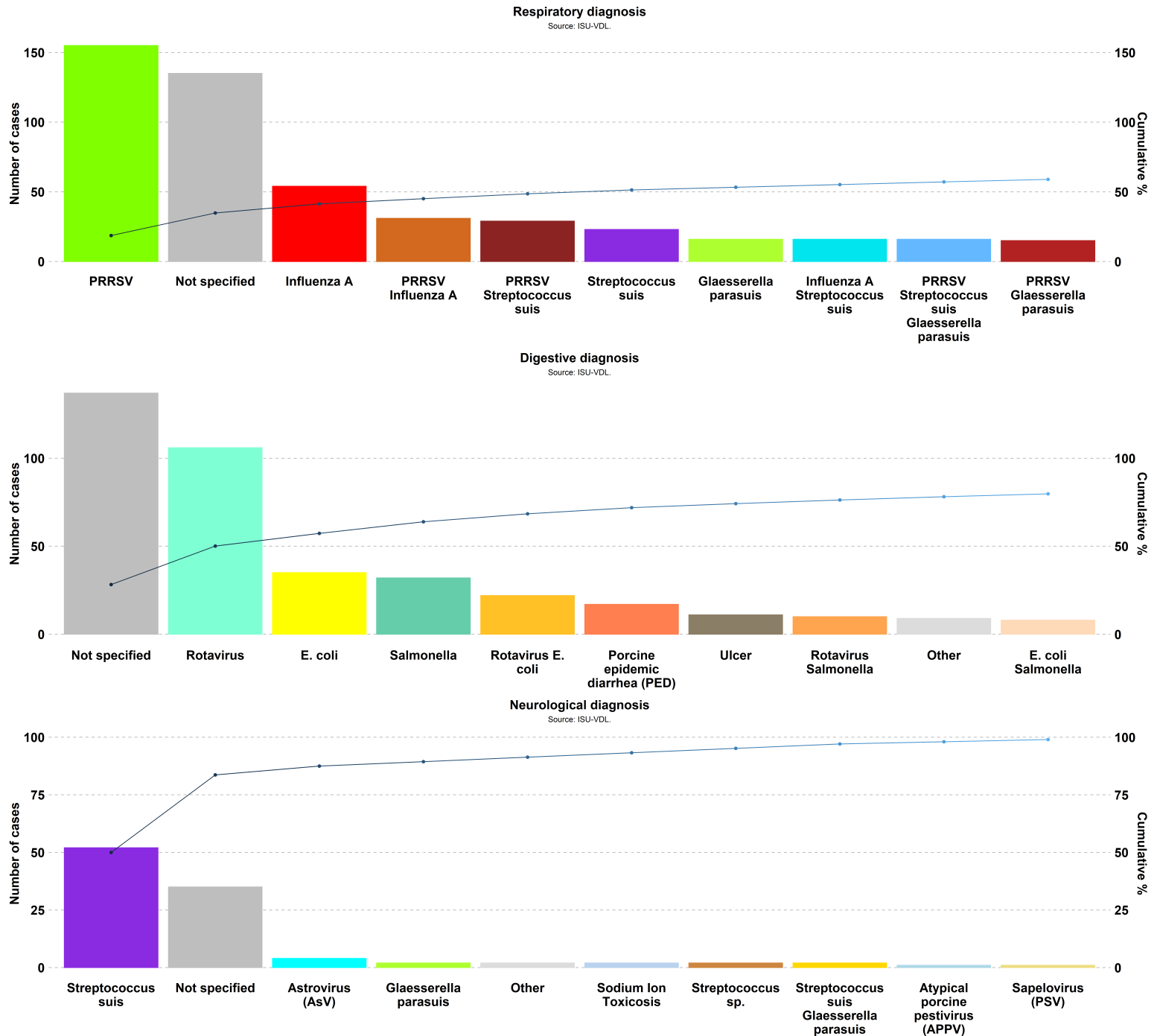### Neurological diagnosis
Source: ISU-VDL.



**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 May 1 to June 21.*

### SDRS Advisory Group highlights:

- PRRSV (155 of 831) continues to lead the number of respiratory diagnoses, after not specified (137 of 485). Rotavirus (128 of 534) leads the digestive diagnoses, and *S. suis* (52 of 104) the neurological diagnosis;
- There were no significant increases (signals) in diagnosis of any pathogen or disease syndrome.