

Swine Disease Reporting System report 10 (December 3rd, 2018)

What is the SDRS?

SHIC-funded, veterinary diagnostic laboratories (VDLs) collaborative project, with goal to aggregate swine diagnostic data from participating reporting VDLs, and report in an intuitive format (web dashboards), describing dynamics of disease detection by pathogen or disease syndrome over time, specimen, age group, and geographical space.

For this report, data is from the Iowa State University VDL and South Dakota State University ADRDL. University of Minnesota VDL and Kansas State University VDL. Specifically, for PRRSV RFLP data, the results are from Iowa State University VDL.

For all “2018 predictive graphs”, the expected value was calculated using a statistical model that takes into account the results from 3 previous years. The intent of the model is not to compare the recent data (2018) to individual weeks of previous years. The intent is to estimate expected levels of percent positive cases based on patterns observed in the past data, and define if observed percentage positive values are above or below the expected based on historic trends.

Note: for this report and upcoming processing fluid samples were classified as coming from suckling piglets.

Collaborators:

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

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

Kansas State University: Jamie Henningson, Eric Herrman, Gregg Hanzlicek, Ram Raghavan, Douglas Marthaler.

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

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** Daniel Linhares: Principal investigator. E-mail: linhares@iastate.edu.

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, Hans Rotto, Jeremy Pittman, Mark Schwartz, Paul Sundberg, Paul Yeske, Pete Thomas, Rebecca Robbins, Tara Donovan.

This report is an abbreviated version of the dashboards that are available online.

To access the full data, use your computer, tablet, or phone to:



- 1) Scan the code below, or go to: www.powerbi.com
- 2) Login: sdrs@iastate.edu
- 3) Password: Bacon 100
- 4) On the left bar, click on ‘Apps’
- 5) Select your dashboard of interest (e.g. PRRS)
- 5) More information at the SDRS webpage <https://fieldepi.research.cvm.iastate.edu/swine-disease-reporting-system/>

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Page 1 – Detection of PRRSV RNA over time by rRT-PCR (1 of 2).

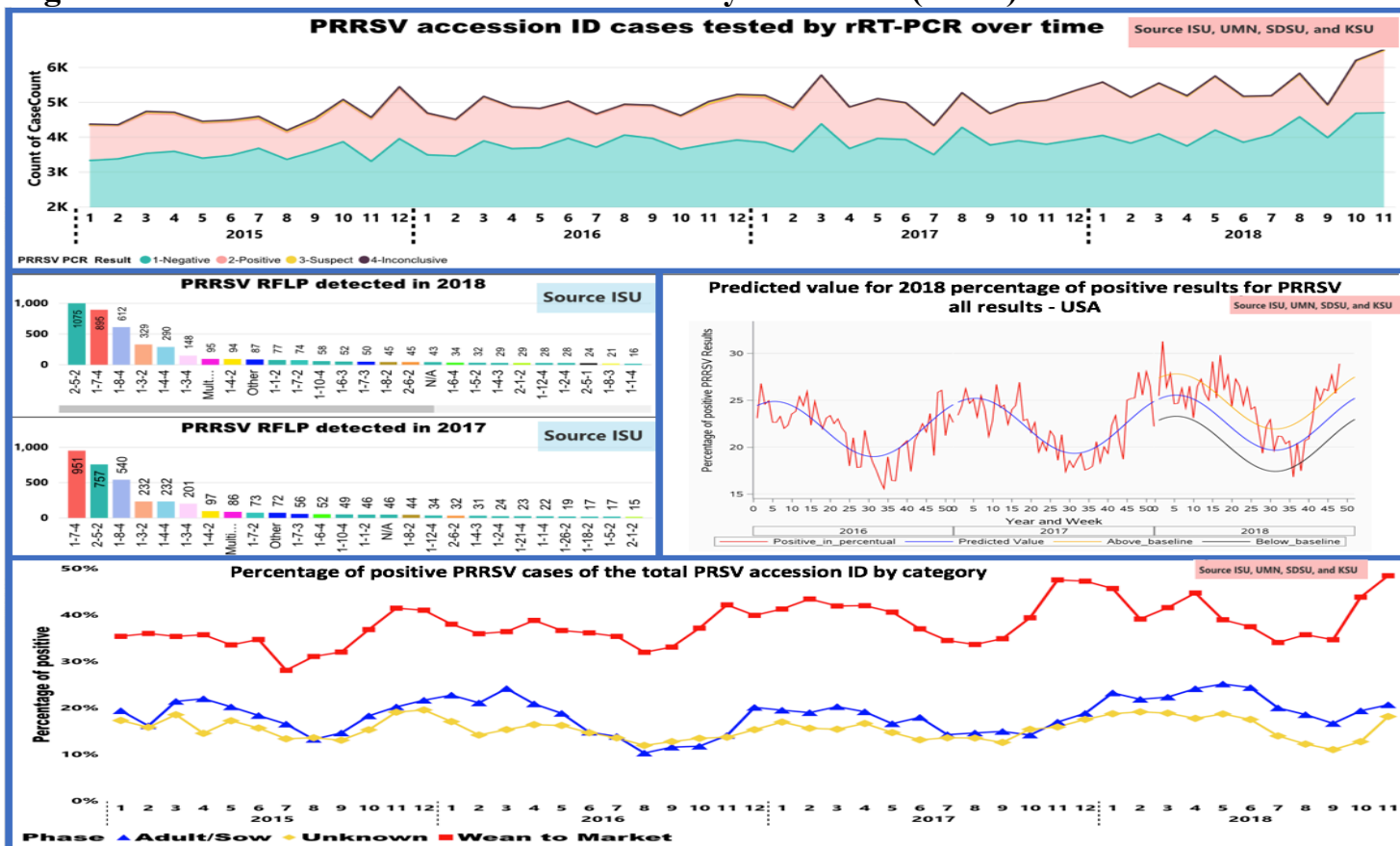


Figure 1 *Top chart:* Results of PRRS rRT-PCR cases over time. *Middle right:* expected percentage of positive results for PRRSV RNA by rRT-PCR, with 1 standard deviation above and below the expected value. *Middle left:* PRRS virus RFLPs detected on 2017, and 2018 for Winter, Spring, and Summer months. *Bottom:* Percentage of PRRS PCR-positive results, by 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

PRRS rRT-PCR data were consolidated from ISU-VDL, UMN-VDL, SDSU-ADRD, and KSU-VDL.

SDRS Advisory Council highlights:

- In 2018 there has been a relative increase of RFLP 2-5-2, 1-8-4, 1-3-2, 1-4-4, 1-1-2, and decrease of RFLP 1-7-4 compared to previous year.
- Level of detection of PRRSV by PCR has been above expected since week 42 of 2018, greatly due to grow-finish cases.
- Percentage of positivity in wean-to-market cases achieved 47.75% in November of 2018. This is very similar to the percentage of positivity obtained in November of 2017 (47.55%).
- There is a trend to increasing positivity in adult/sow, and unknown categories. The change from October 2018 to November 2018 was from 12.75% to 18.84 for unknown, and from 19.38% to 20.84% for adult/sow.

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Page 1 – Frequency of detection of multiple PRRSV RFLP during 2018 (2 of 2).

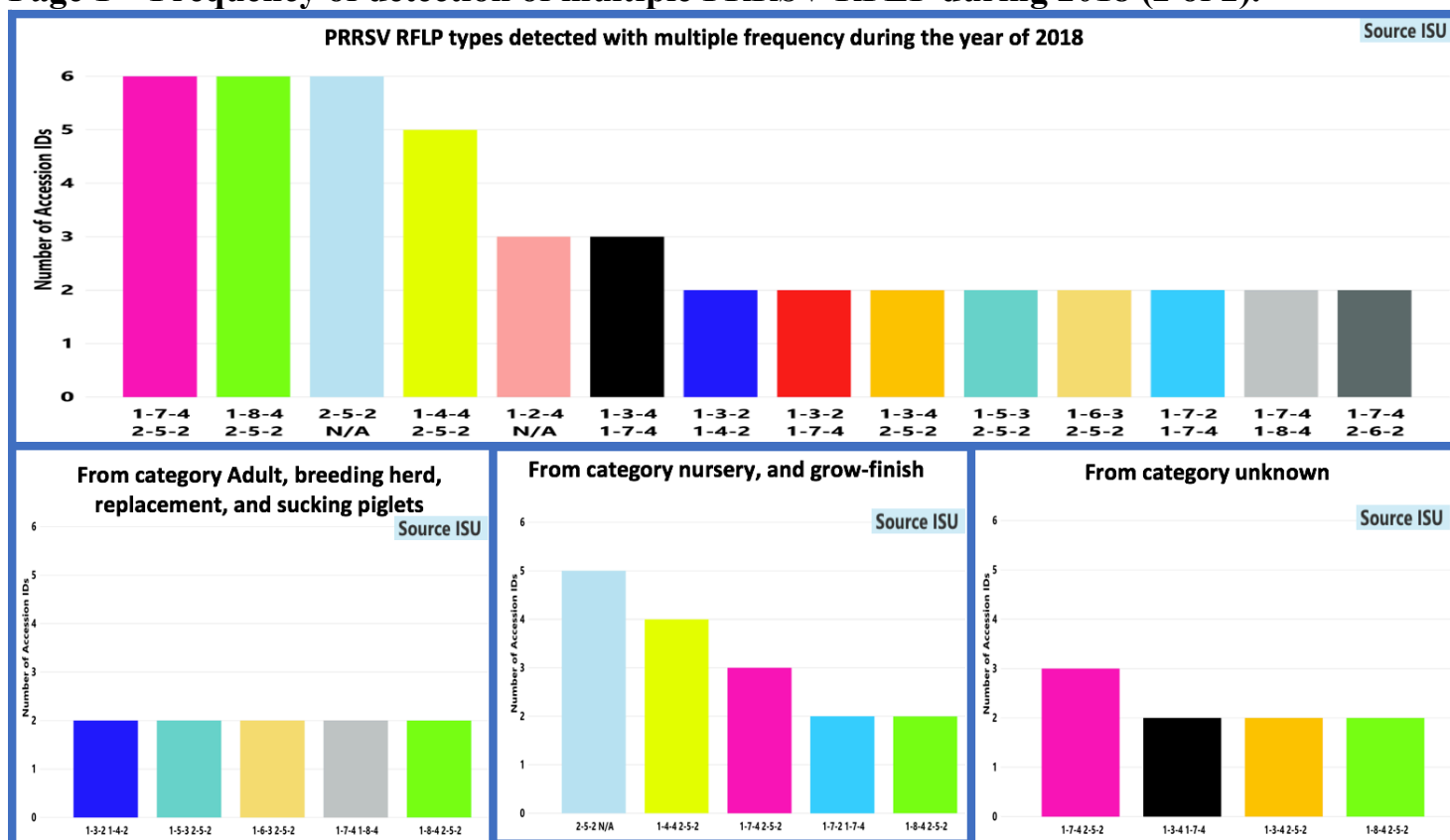


Figure 2 Multiple PRRSV RFLP detection during year of 2018 per accession ID. Each bar and color indicate a different combination of RFLP. RFLPs indicated as N/A represents European PRRSV type sequence.

SDRS Advisory Council highlights:

- Since last report, there are 2 more sequences with multiple RFLP 1-4-4 and 2-5-2.

Page 2 – Detection of enteric coronaviruses by rRT-PCR

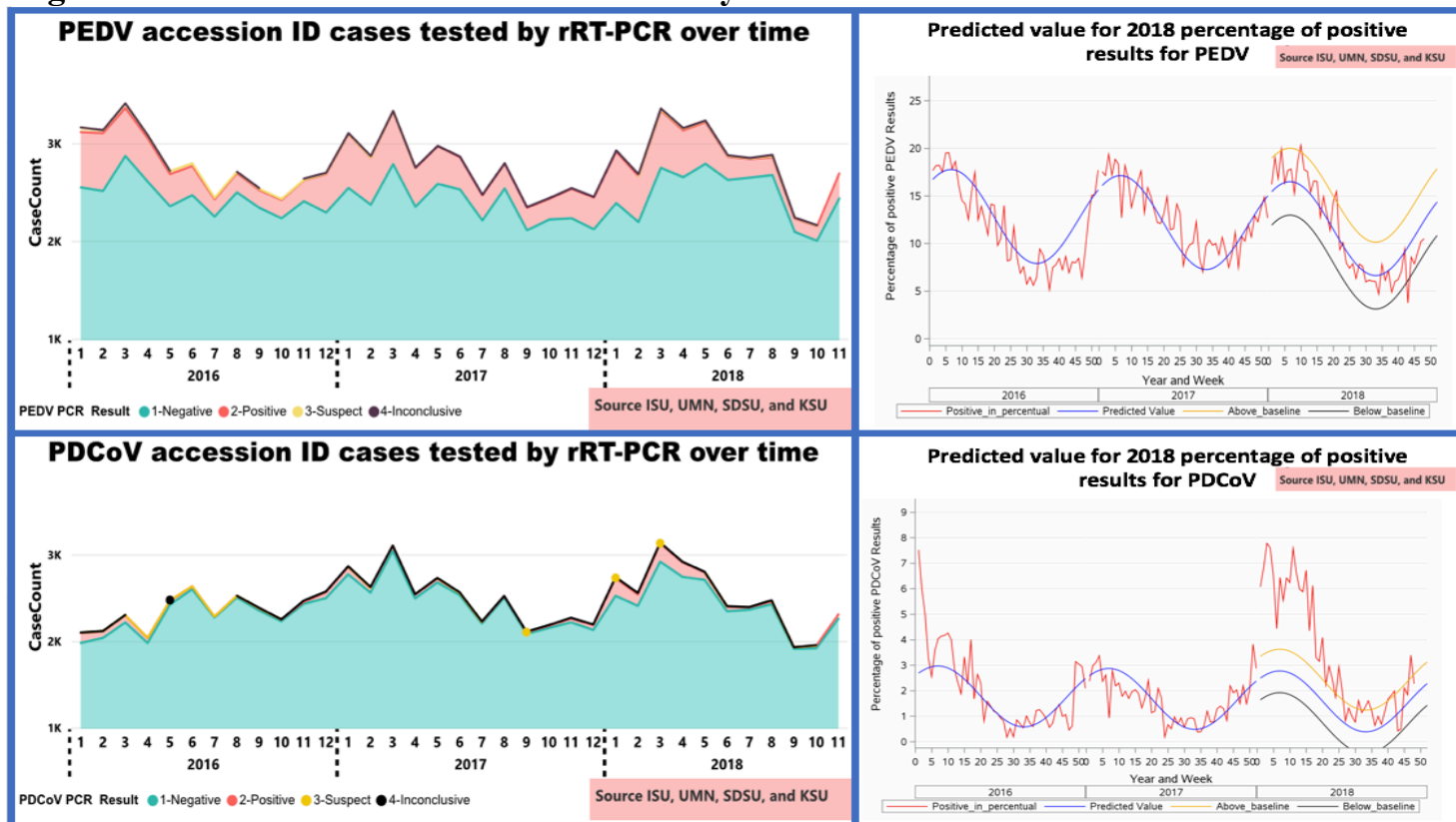


Figure 3 Left side: results of PEDV, and PDCoV rRT-PCR cases over time. Right side charts: expected percentage of positive results for PEDV and PDCoV by rRT-PCR, with 1 standard deviation above and below the expected value, respectively.

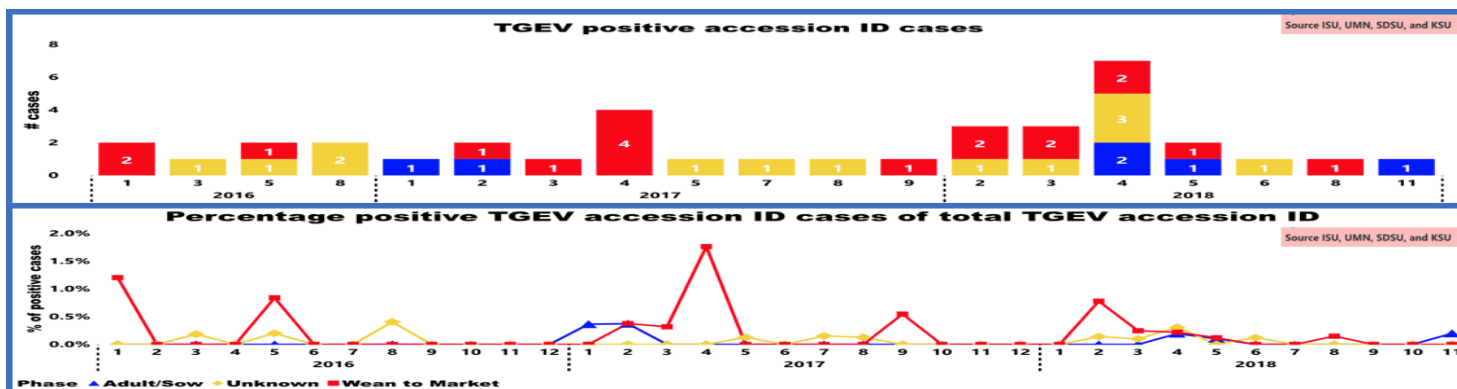


Figure 4 Top: number of positive accession ID results of TGEV by category. Bottom: percentage of positive results for TGEV by category. Each color represents one distinct category. Wean to market corresponds to nursery, and grow-finish. Adult/Sow correspond to adult, boar stud, breeding herd, replacement, and suckling piglets. Unknown corresponds to not informed site type or farm category

PEDV, PDCoV, and TGEV rRT-PCR test results were consolidated from ISU-VDL, UMN-VDL, SDSU-ADRD, and KSU-VDL.

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Swine Disease Reporting System



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UNIVERSITY OF MINNESOTA
VETERINARY DIAGNOSTIC LAB



Kansas State Veterinary
DIAGNOSTIC LABORATORY



SOUTH DAKOTA
STATE UNIVERSITY



SOUTH DAKOTA
ADRDL
ANIMAL DISEASE RESEARCH
& DIAGNOSTIC LABORATORY



Swine Health Information Center

SDRS Advisory Council highlights:

- a) Level of detection of PEDV by PCR continues to meet the expected value, with indication of relatively low increasing activity of the virus this 'winter' so according to the expected.
- b) There was a spike in percentage of PDCoV PCR testing in the week 47 and 48.
- c) There has been limited number of cases of TGEV, with only one detection in November 2018.

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Page 3 – Detection of pathogens associated with CNS disease

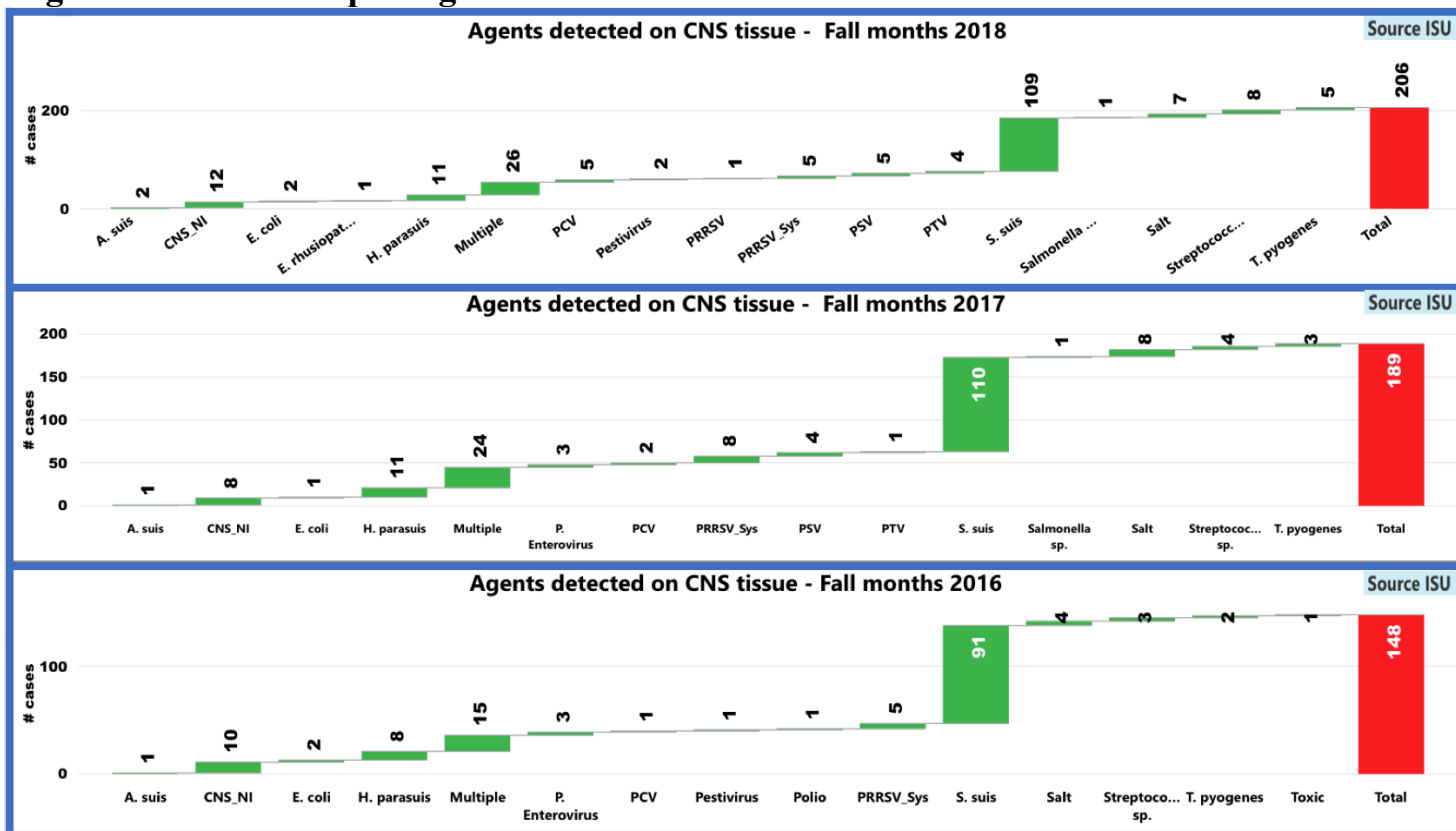


Figure 4 Pathogen detection on CNS tissue over time. Each green bar indicates a different agent or syndrome. The red bar accounts for the sum of the green bars. Bottom: fall months of 2016, middle fall months of 2017, top summer fall of 2018. Fall months contains results of September, October, and November. ‘Multiple agents’ represent cases with more than one pathogen detected on CNS tissues.

SDRS Advisory Council highlights:

- The number of accession ID cases investigated for CNS disorders increased by 8.99% for the Fall season of 2018, when compared with Fall season of 2017.
- The number of cases per agent have similar distribution this Fall, compared to the same season of previous years. *Streptococcus suis* is still the major agent causing CNS.



Page 4 – Detection of pathogens in respiratory tissue over time (1 of 2)

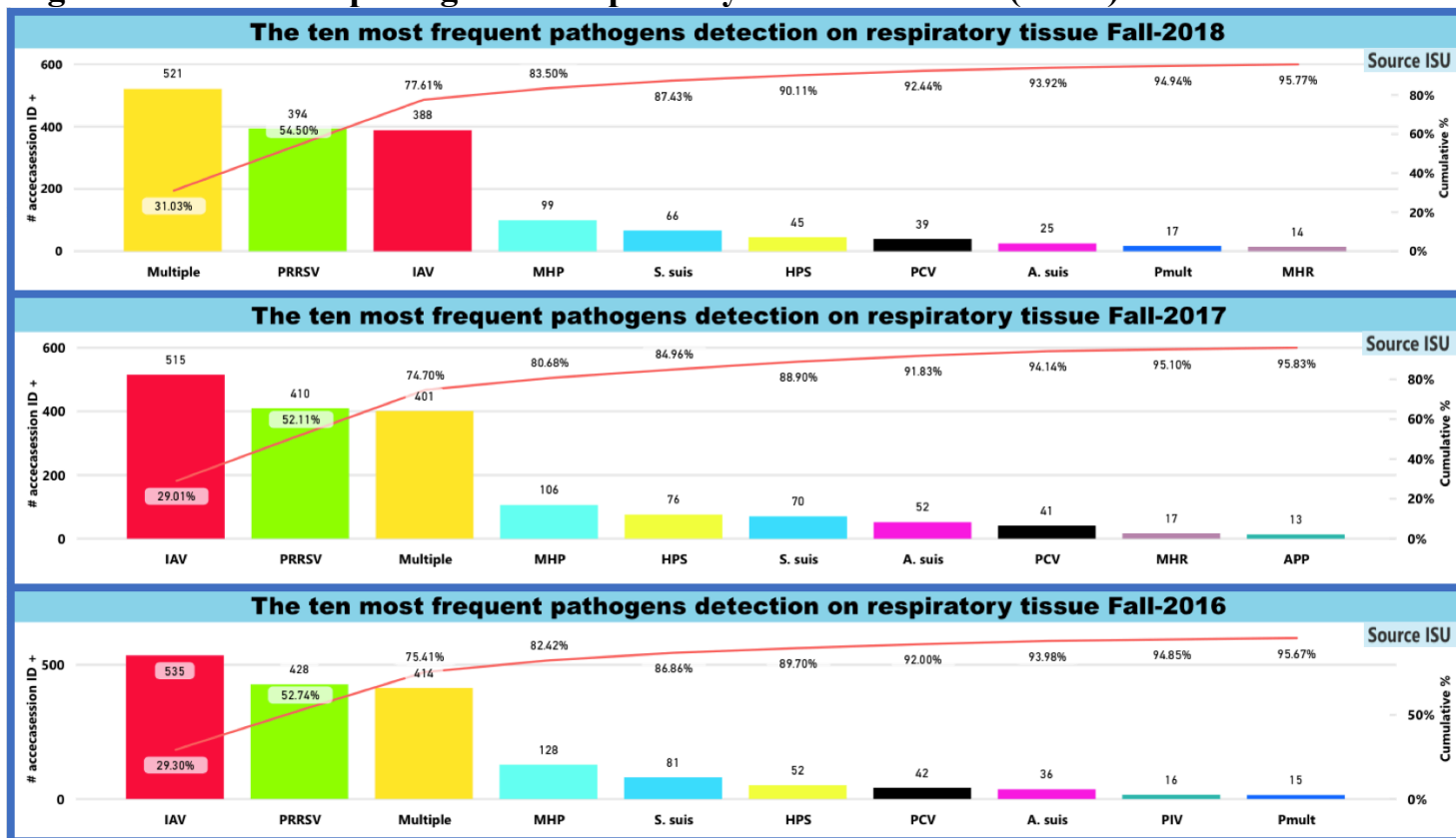


Figure 5 Pathogen detection on respiratory tissues over time. Each green bar indicates a different agent or syndrome. The red line accounts for the cumulative percentage of the green bars. Bottom: fall months of 2016, middle fall months of 2017, top fall months of 2018. Fall months include September, October, and November. ‘Multiple agents’ represent cases with more than one pathogen detected on respiratory tissues.

SDRS Advisory Council highlights:

- The number of accession ID that reported detection of multiple agents in Fall 2018 was higher than previous years.
- Influenza A (IAV) as a single agent was less frequent detected in 2018 then previous Fall seasons of 2017 and 2016.
- PRRSV as a single agent was slightly less frequent in 2018 than previous year Fall season.



Page 4 – Detection of pathogens in respiratory tissue over time (2 of 2)

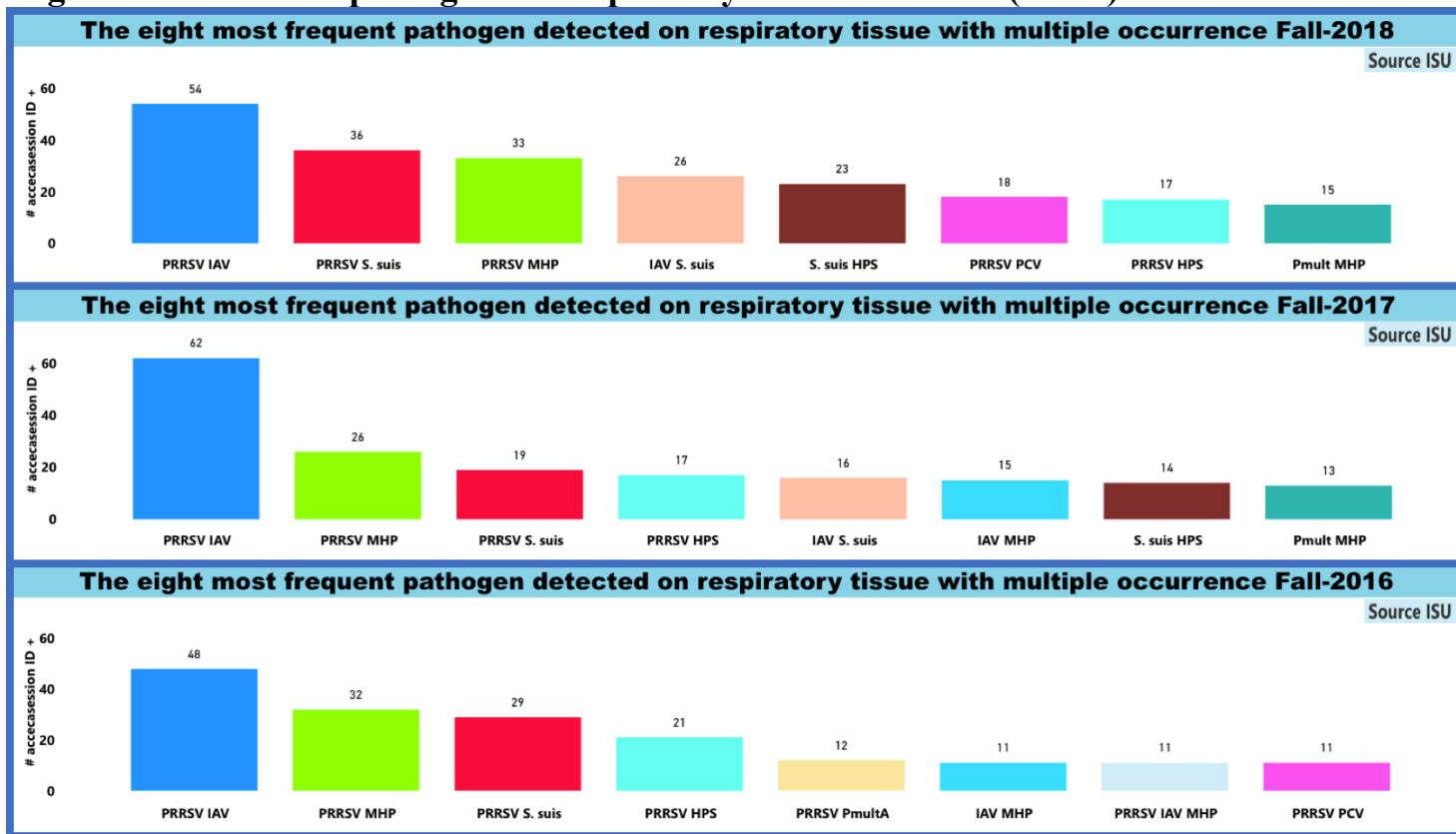


Figure 6 Multiple agents detected in respiratory tissue per accession ID case level. Each bar represents a combination of 2 or more agents.

SDRS Advisory Council highlights:

- There was an increase in the following associations of pathogens detected in respiratory tissues this Fall compared to the same period of previous years: PRRSV and *S. suis*, IAV and *S. suis*, PRRSV and PCV2, and *Haemophilus parasuis* and *Streptococcus suis*.



Page 5 – Detection of pathogens in enteric tissue over time (1 of 2)

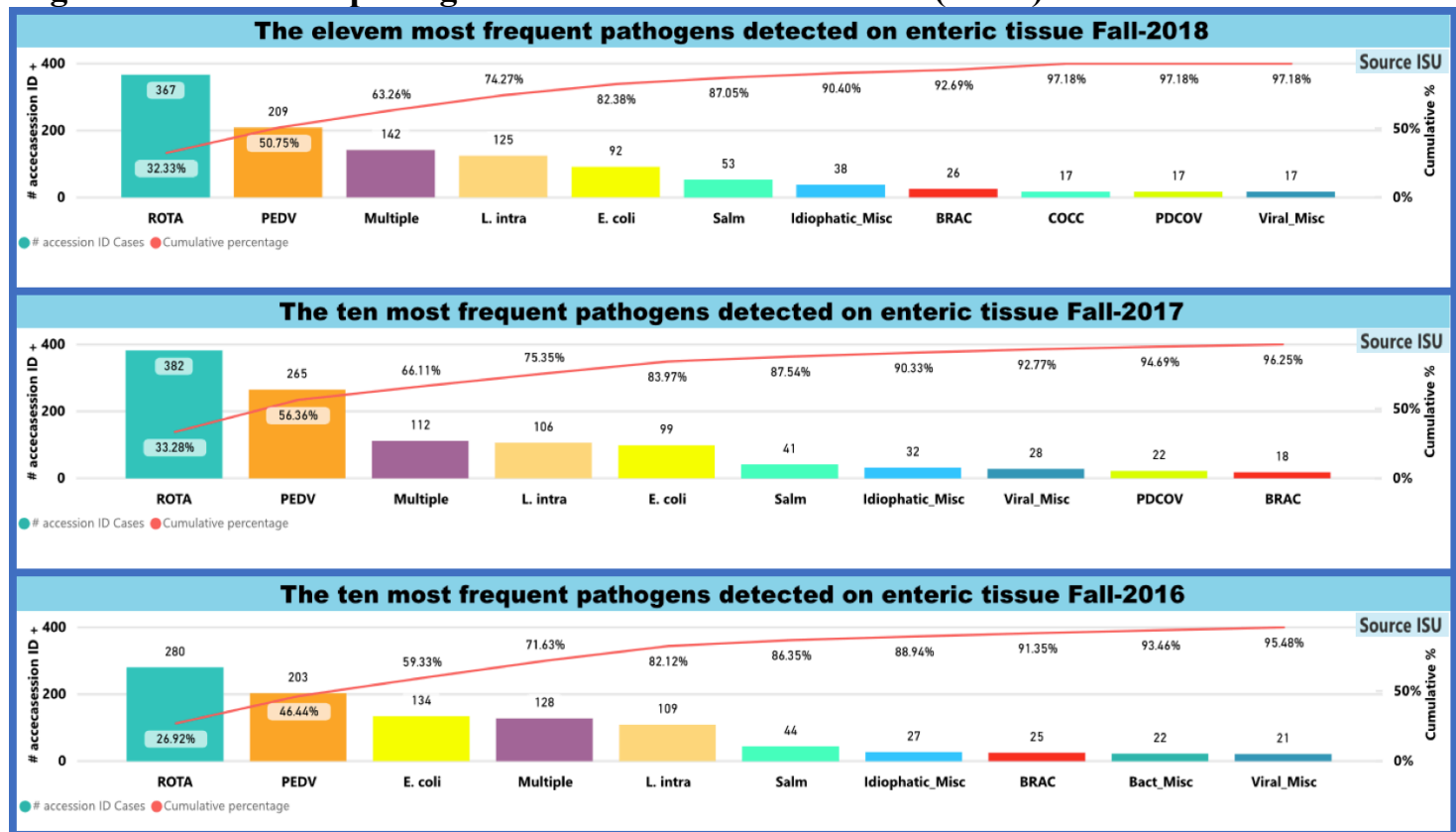


Figure 7 Pathogen detection on enteric tissues over time. Each green bar indicates a different agent or syndrome. The red line accounts for the cumulative percentage of the green bars. Bottom: fall months of 2016, middle fall months of 2017, top fall months of 2018. Fall months include September, October, and November. ‘Multiple agents’ represent cases with more than one pathogen detected on respiratory tissues.

SDRS Advisory Council highlights:

- L. intracellularis*, *Salmonella spp.* and COOC (coccidia) had higher frequency of detection in the 2018 Fall season compared to previous years Fall seasons.

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Page 5 – Detection of pathogens in enteric tissue over time (2 of 2)

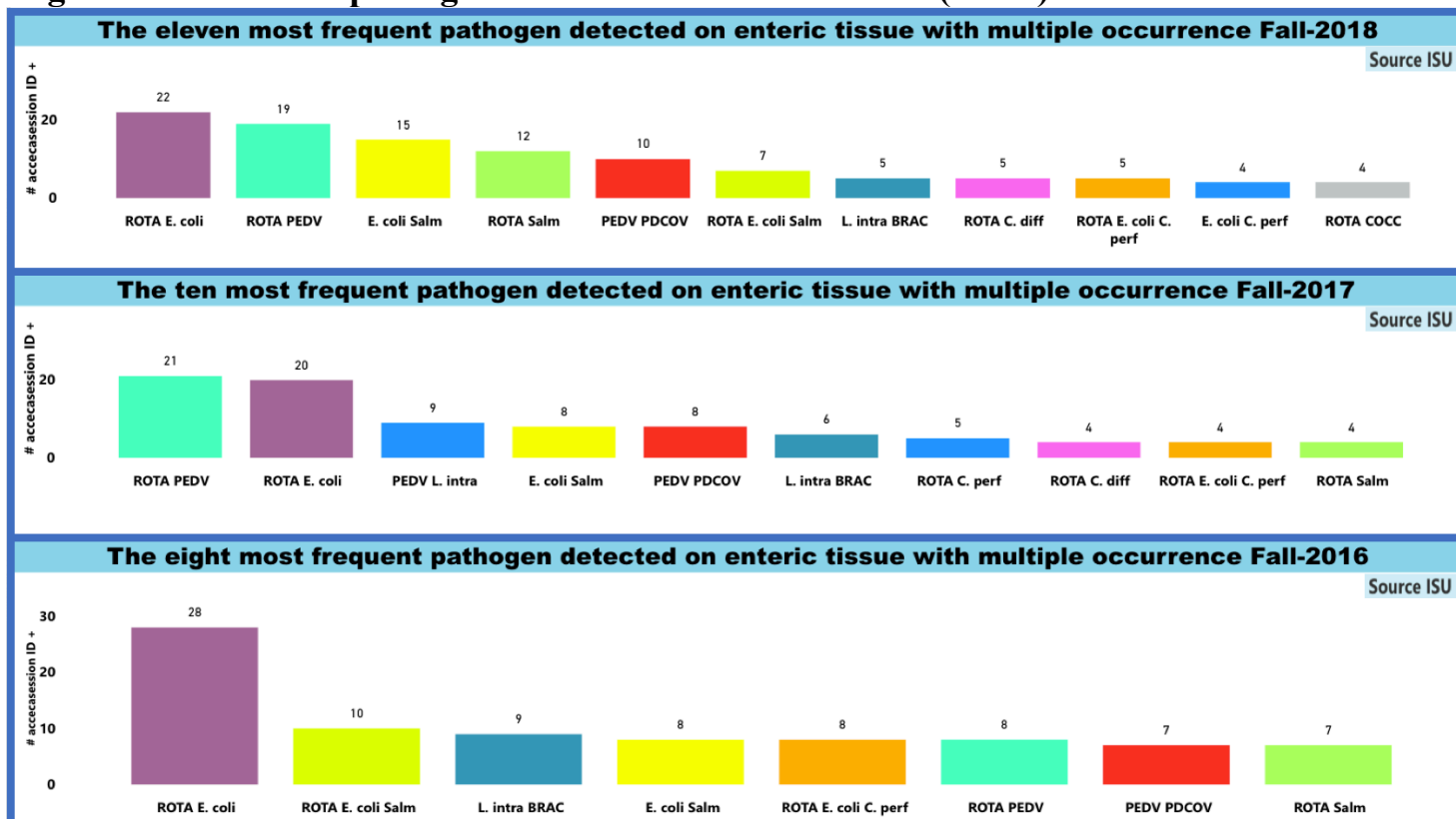


Figure 8 Multiple agents detected in enteric tissue per accession ID case level. Each blue bar represents a combination of 2 or more agents.

SDRS Advisory Council highlights:

- Coinfection between *E. coli* and *Salmonella spp.*, (*E. coli* Salm), Rotaviruses and *Salmonella spp.* (ROTA Salm), and Rotaviruses, *E. coli* and *Salmonella spp* (ROTA E.coli Salm) had increased detection for Fall of 2018 compared to the same period of previous years.
- All cases of *E. coli* and Salmonellas, those for Rotaviruses, *E. coli* and Salmonellas, and 10 of 12 for Rotaviruses and Salmonellas were diagnosed as enteritis.
- There were 4 cases of enteritis caused by coinfection between Rotaviruses and Coccidia (ROTA COCC) reported in Fall season of 2018.