Swine Disease Reporting System

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Report 8 (October 2, 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 considers 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.

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, Kimberly VanderWaal, Andres Perez, 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.

* Giovani Trevisan: Project coordinator. E-mail: trevisan@iastate.edu.
** 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:

Power BI

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)

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

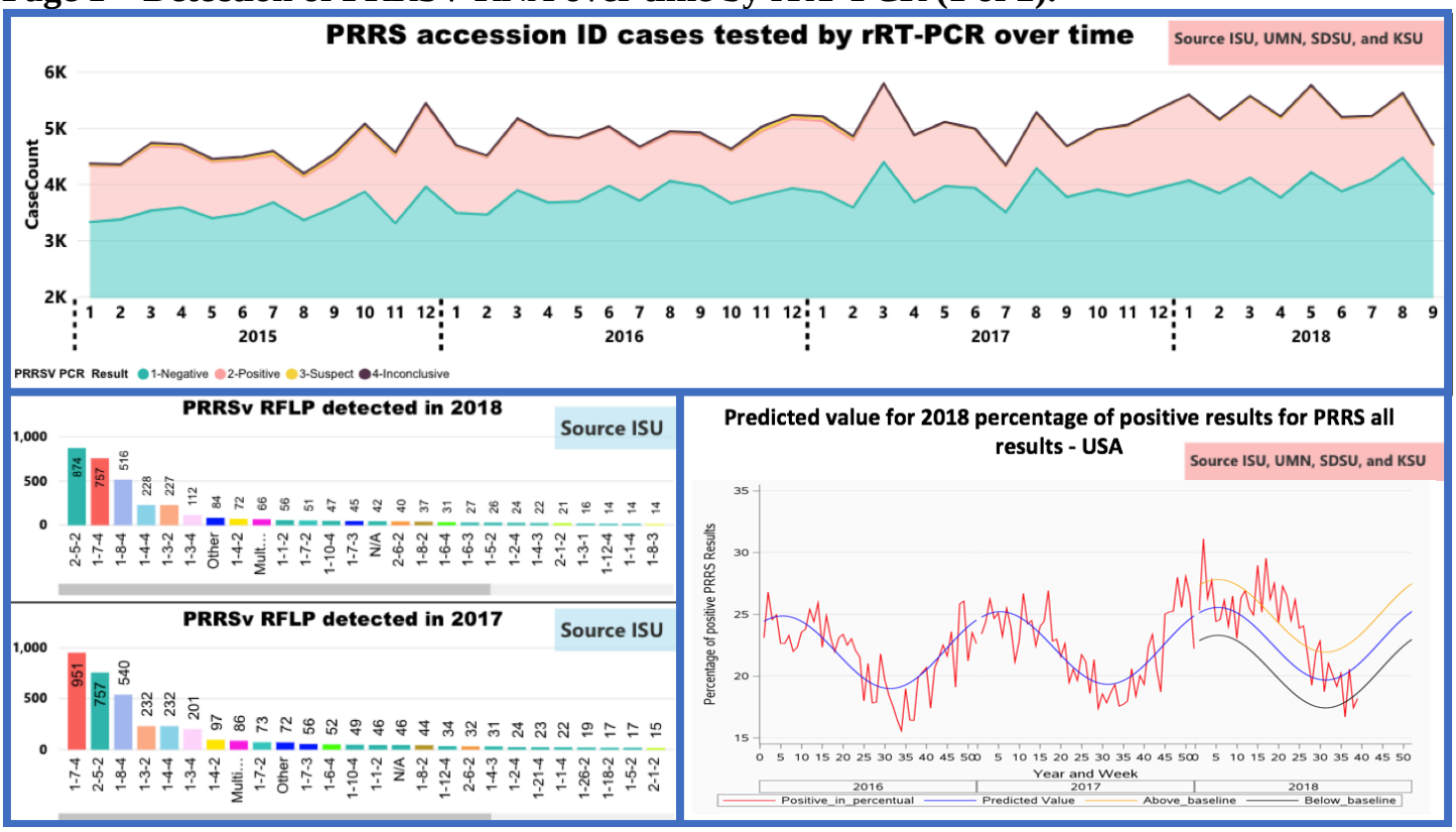

Figure 1 *Top chart*: Results of PRRS rRT-PCR cases over time. *Bottom right*: expected percentage of positive results for PRRSV RNA by rRT-PCR, with 1 standard deviation above and below the expected value. *Bottom left*: PRRS virus RFLPs detected on 2017, and 2018 for Winter, Spring, and Summer months.

PRRS rRT-PCR data were consolidated from Iowa State University Veterinary Diagnostic Laboratory (ISU-VDL), University of Minnesota Veterinary Diagnostic Laboratory (UMN-VDL), South Dakota State University Animal Disease Research & Diagnostic Laboratory (SDSU-ADRDL), and Kansas State University Veterinary Diagnostic Laboratory (KSU-VDL).

SDRS Advisory Council highlights:

a) The PRRSv RNA detection level has been within the predicted values in the previous 9 weeks.

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

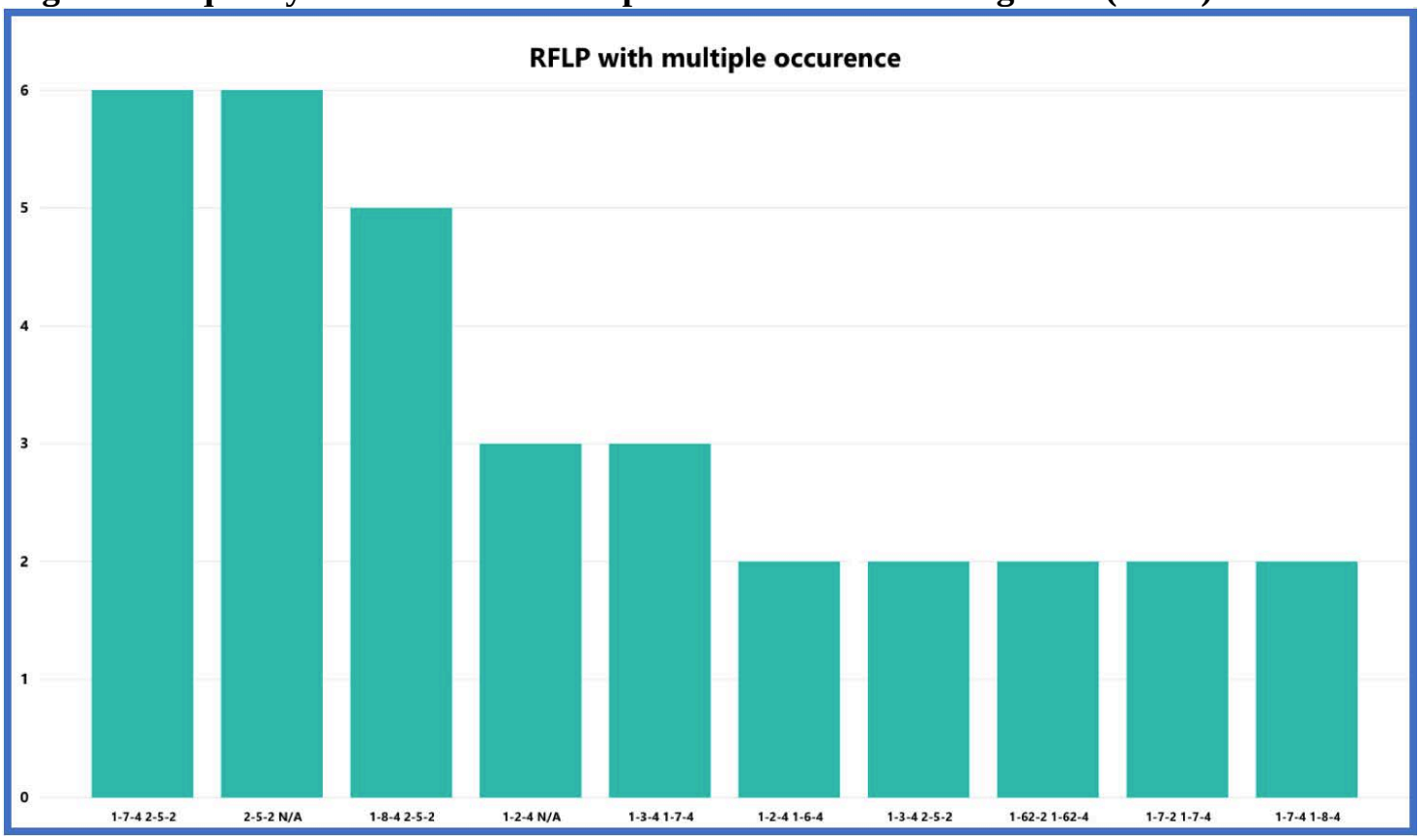

Figure 2 Multiple PRRSV RFLP detection during year of 2018. Each green bar indicates a different combination of RFLP. RFLPs indicated as N/A represents European PRRSv type sequence.

SDRS Advisory Council highlights:

a) The most frequent combinations of multiple RFLP types are a wild type virus with a vaccine-like virus. Sequence 2-5-2 is predominantly vaccine-like sequence.

Page 2 – Detection of enteric coronaviruses by rRT-PCR

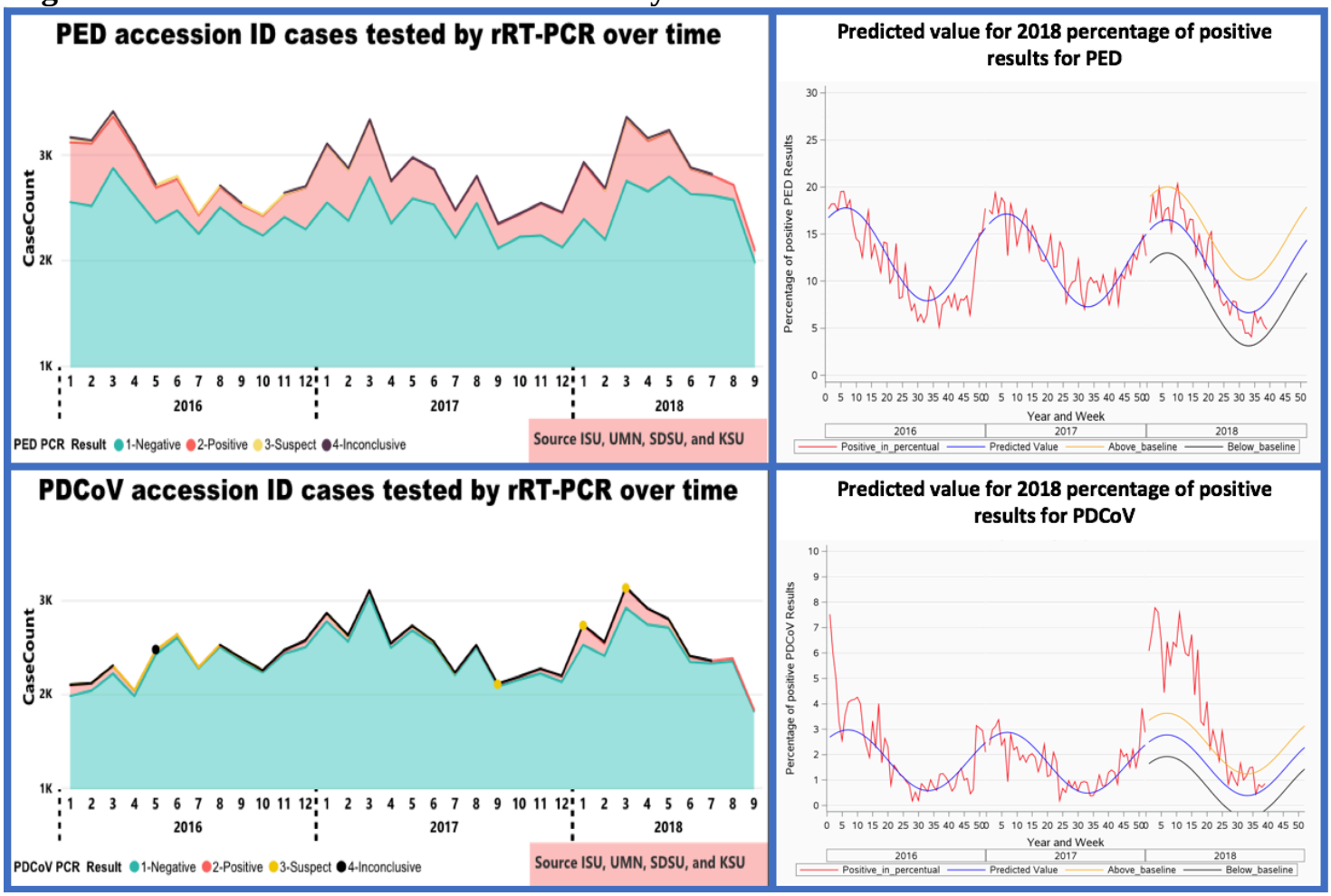

Figure 3 Left side: results of PEDV, and PDCoV rRT-PCR cases over time. Right side charts: expected percentage of positive results for PEDV and PDCoV by rRT-PCR, with 1 standard deviation above and below the expected value, respectively.

PEDV, PDCoV, and TGEV rRT-PCR test results were consolidated from Iowa State University Veterinary Diagnostic Laboratory (ISU-VDL), University of Minnesota Veterinary Diagnostic Laboratory (UMN-VDL), South Dakota State University Animal Disease Research & Diagnostic Laboratory (SDSU-ADRDL), and Kansas State University Veterinary Diagnostic Laboratory (KSU-VDL).

SDRS Advisory Council highlights:

a) The pattern of detection of PEDv RNA continues to meet the expected value;
b) PDCoV detection rate returned to baseline (expected values);
c) There has been a relative increase in PDCoV detection level in the last 3 weeks of every year since 2015;
d) Based on the predicting model it is expected a relative increase of positivity of PEDV and PDCoV for the upcoming weeks/months.

Page 3 – Detection of pathogens associated with CNS disease

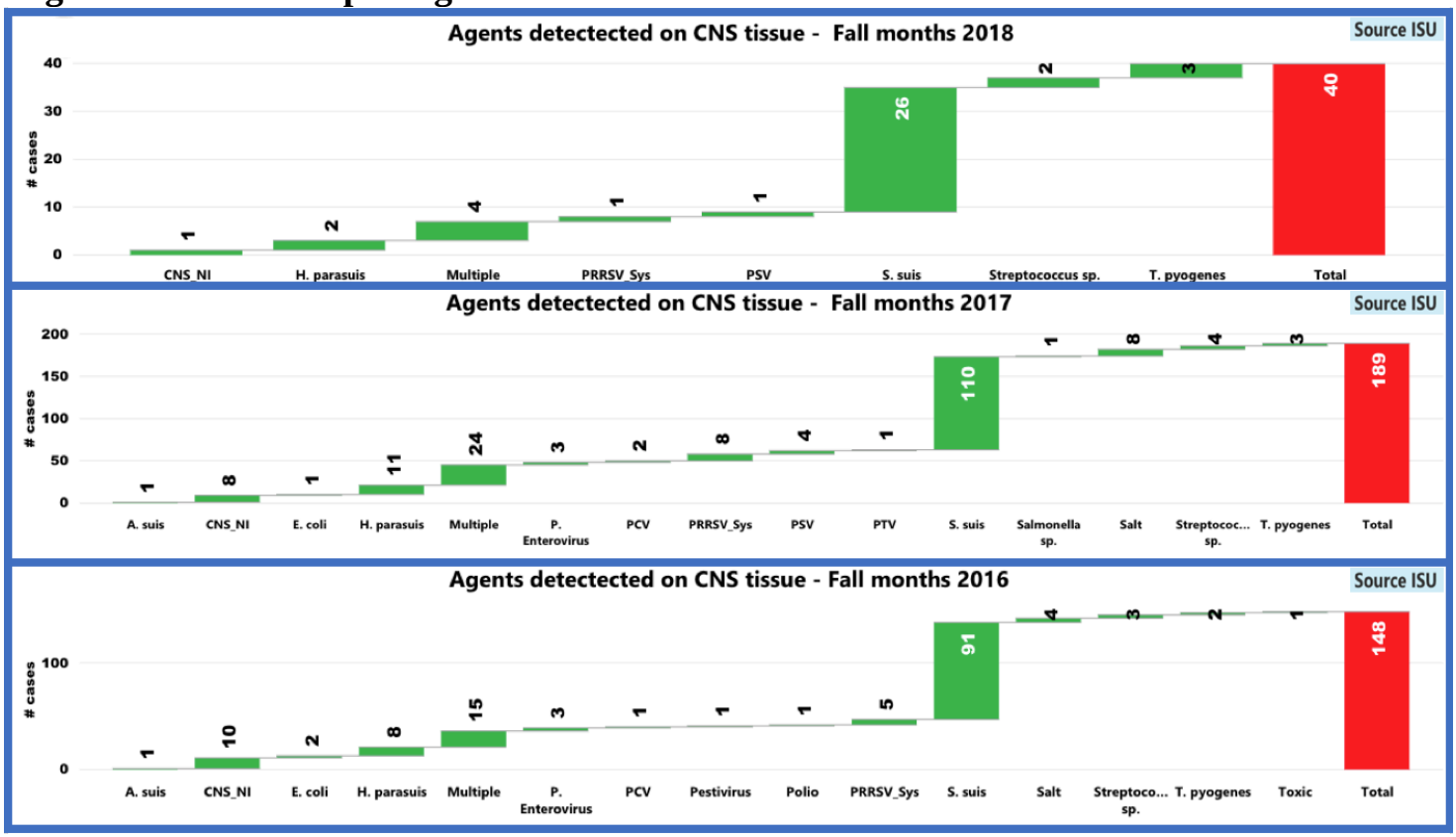

Figure 4 Pathogen detection on CNS tissue over time. Each green bar indicates a different agent or syndrome. The red bar accounts for the sum of the green bars. Bottom: fall months of 2016, middle fall months of 2017, top summer fall of 2018. Fall months contains results of September, October, and November.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

SDRS Advisory Council highlights:

a) *S. suis* continues to be the major pathogen associated to CNS disease.

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

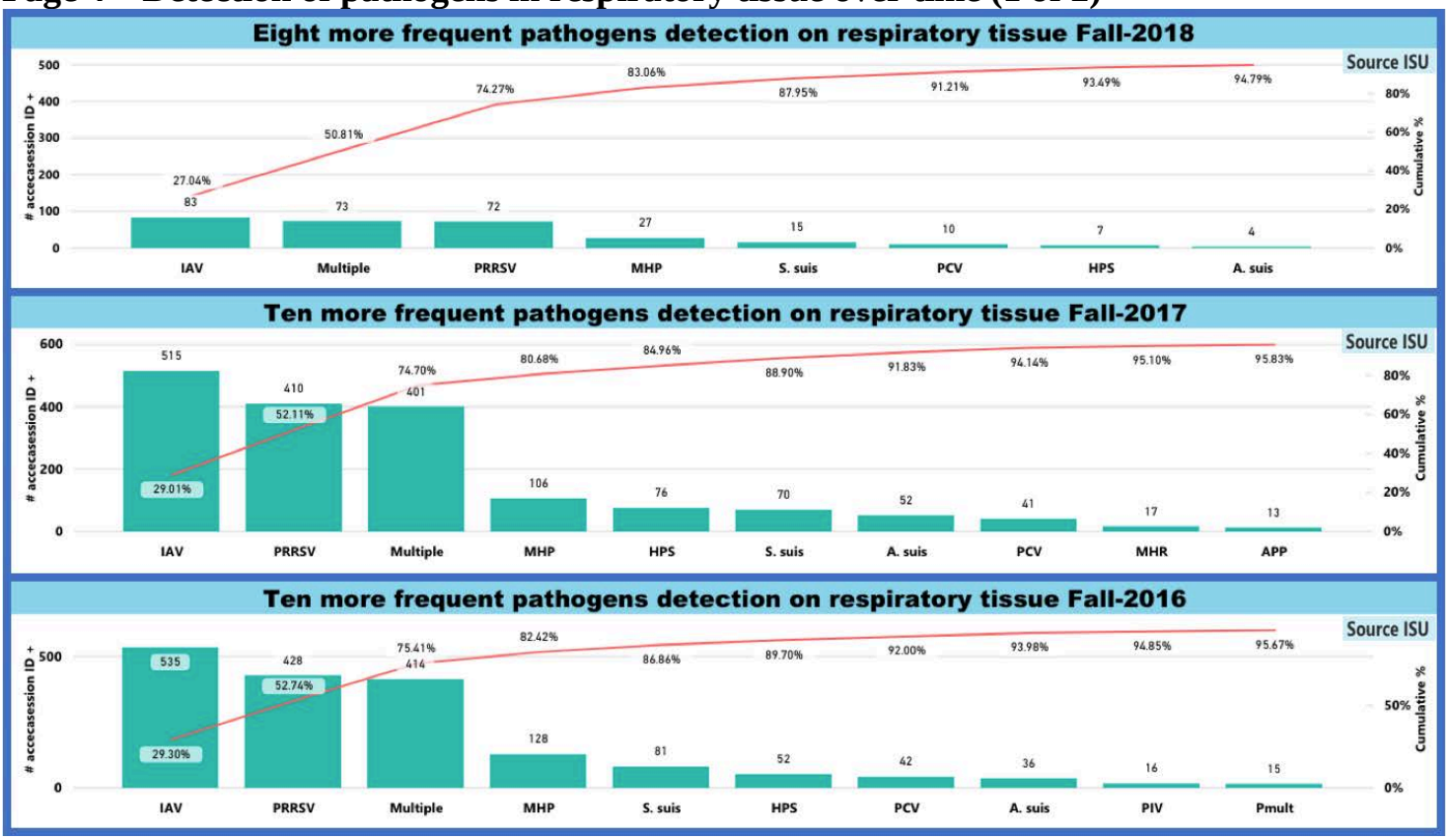

Figure 5 Pathogen detection on respiratory tissues over time. Each green bar indicates a different agent or syndrome. The red line accounts for the cumulative percentage of the green bars. Bottom: fall months of 2016, middle fall months of 2017, top fall months of 2018. Fall months include September,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

SDRS Advisory Council highlights:

The Fall of 2018 is starting with detection of respiratory similar to the Fall season of previous years.

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

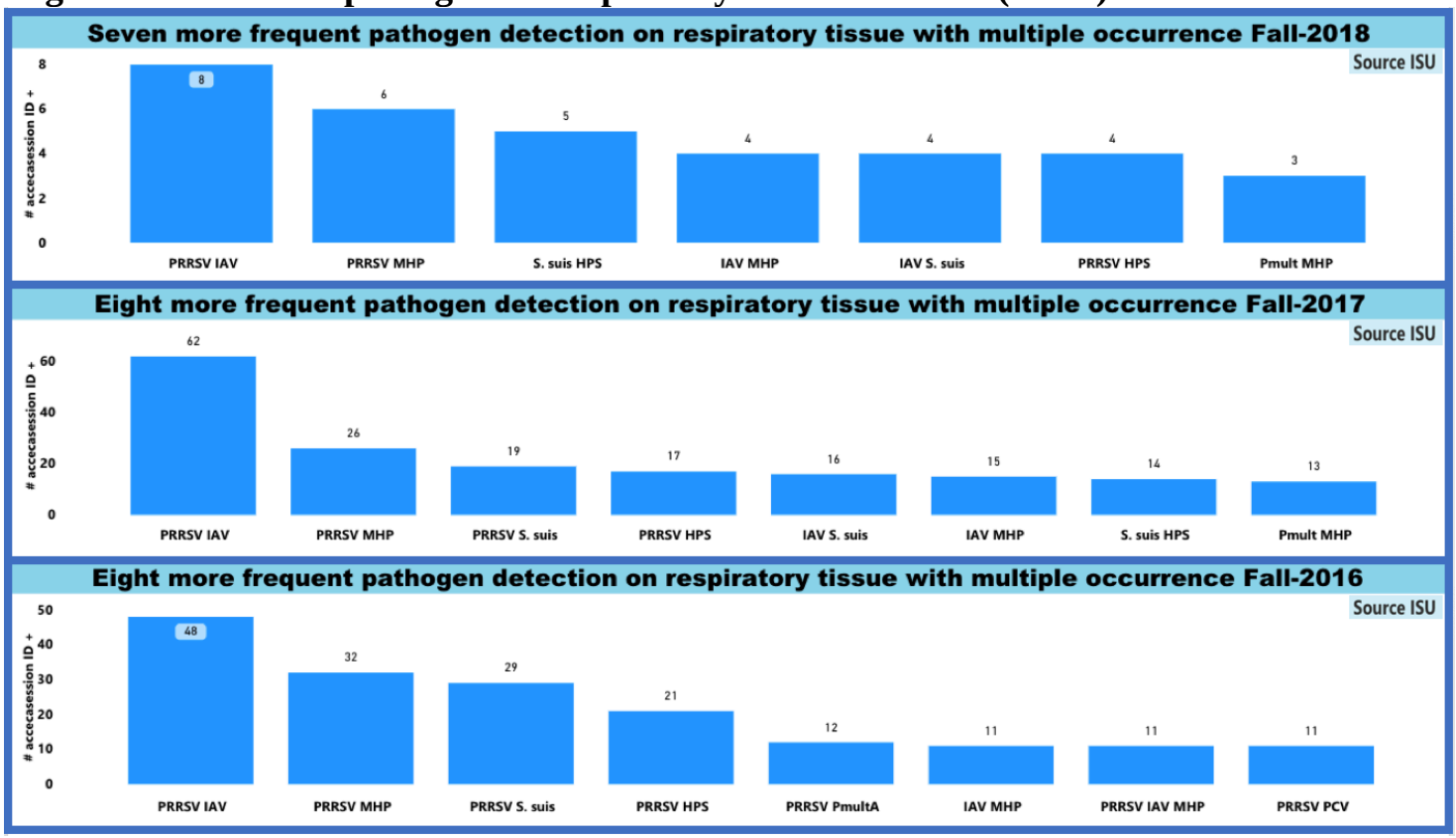

Figure 6 Multiple agents detected in respiratory tissue per accession ID case level. Each blue bar represents a combination of 2 or more agents.

SDRS Advisory Council highlights:

a) Coinfection between *S. suis* and HPS seems to be more frequent than previous years.

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

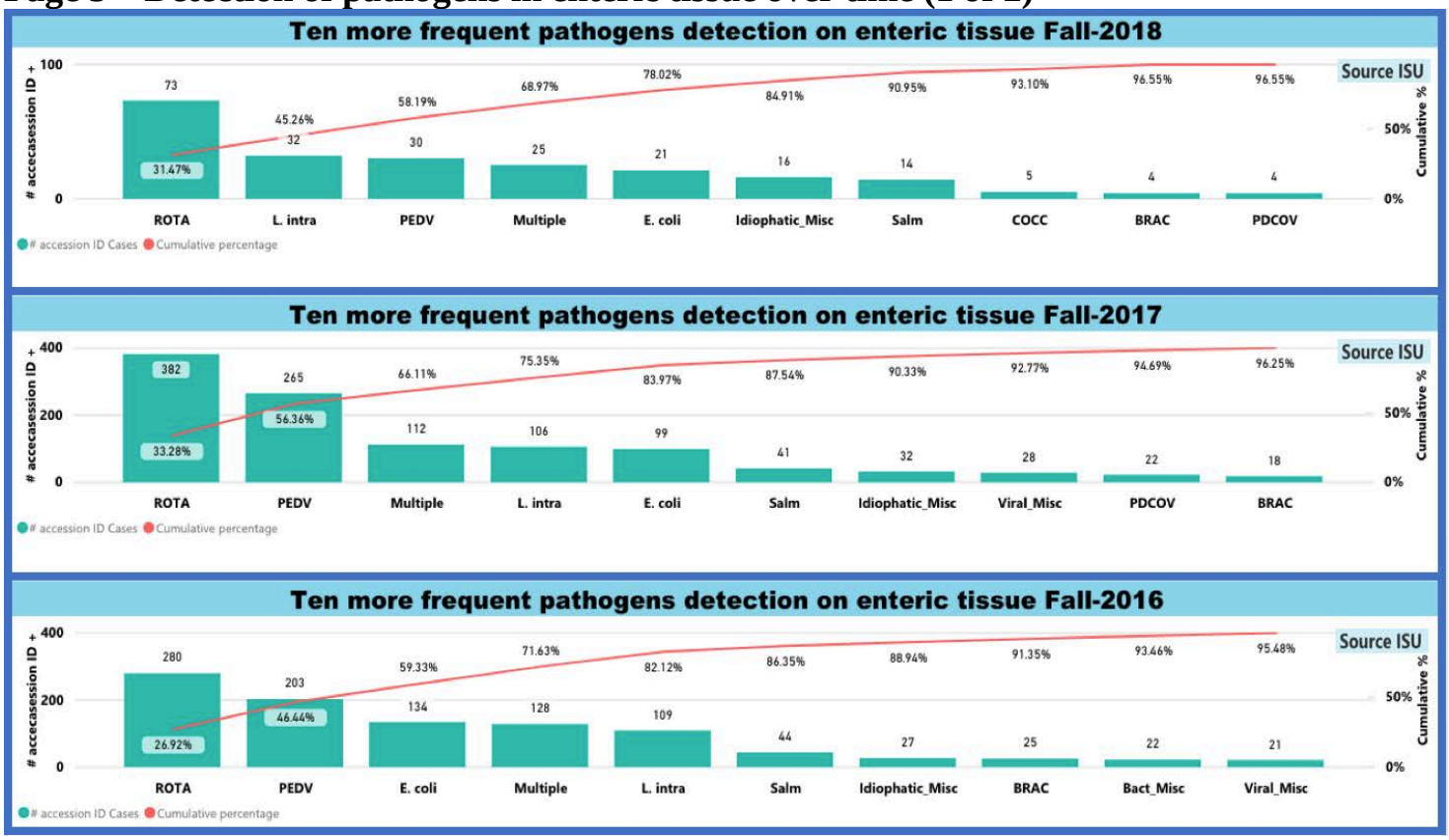

Figure 7 Pathogen detection on enteric tissues over time. Each green bar indicates a different agent or syndrome. The red line accounts for the cumulative percentage of the green bars. Bottom: fall months of 2016, middle fall months of 2017, top fall months of 2018. Fall months include September, October,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

SDRS Advisory Council highlights:

a) COCC is appearing between the top 10 agents detected on enteric tissues. As a comparison, there were 12 cases in the Fall (September, October, and November) of 2017, and 14 cases in the Fall of 2016.

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

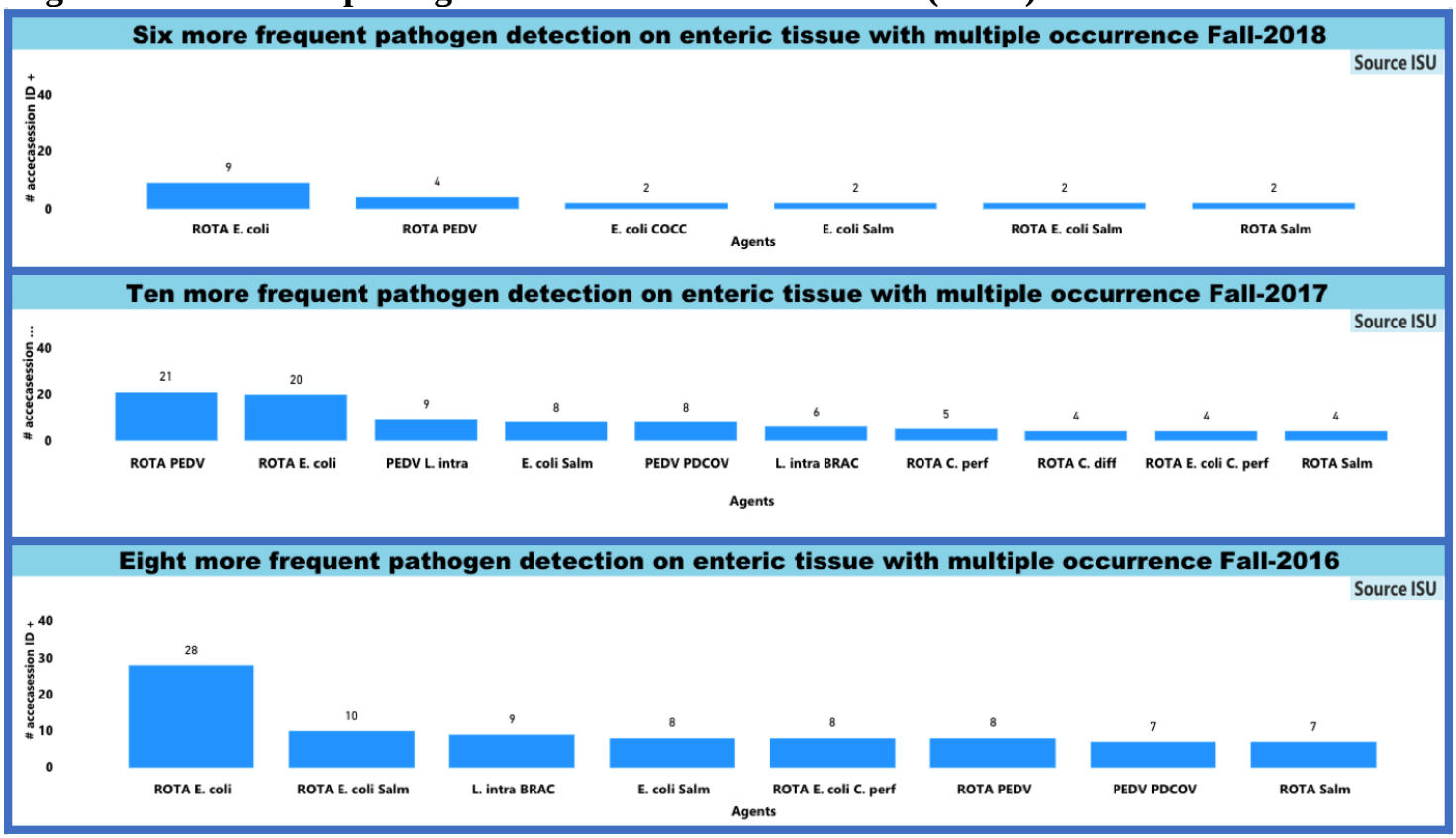

Figure 8 Multiple agents detected in enteric tissue per accession ID case level. Each blue bar represents a combination of 2 or more agents.

SDRS Advisory Council highlights:

a) Coinfections involving *E. coli* and other agents appears to be more frequent for 2018 Fall season, compared to previous years Fall season.

b) Coinfection between *E. coli* and COCC has increased reporting in Fall of 2018 compared to the same period of previous years. During Fall of 2016 and 2017 this coinfection was not reported.