Swine Disease Reporting System
Report 14 (April 2, 2019)

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, and syndromic information the results are from Iowa State University VDL.

For all "2019 predictive graphs," the expected value was calculated using a statistical model that considers the results from three previous years. The intent of the model is not to compare the recent data (2019) 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, Cesar Corzo, Jerry Torrison.

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

South Dakota State University: Shivali Gupta, 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, Mark Schwartz, Paul Sundberg, Paul Yeske, Pete Thomas, Rebecca Robbins, Tara Donovan, Matthew Turner, Deborah Murray.

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

To access the full data, use your computer, tablet, or phone and go to the web page:

https://fieldepi.research.cvm.iastate.edu/swine-disease-reporting-system/

and look for the dashboard corresponding to each pathogen or syndrome.

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Swine Disease Reporting System

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

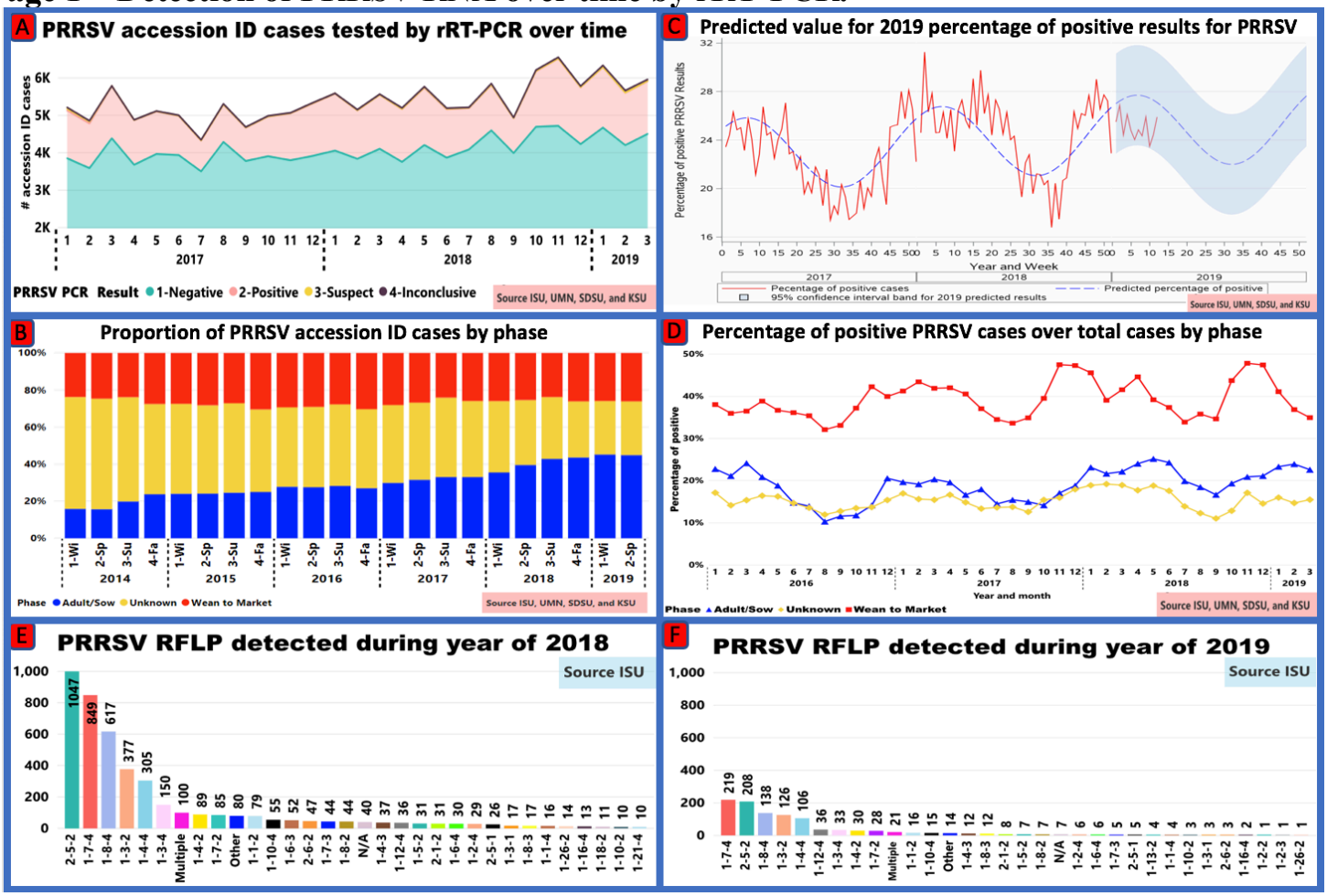

Figure 1. A: Results of PRRS rRT-PCR cases over time. **B**: Proportion of accession ID cases tested for PRRSV by age group per year and season. **C**: expected percentage of positive results for PRRSV RNA by rRT-PCR, with 95% confidence interval band for predicted results. **D**: percentage of PRRS 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 2018. RFLPs indicated as N/A represents not detected or European PRRSV type.

SDRS Advisory Council highlights:

a) PRRSV activity is within the predicted value. Based on comments from the advisory board, this agrees with perception that this PRRS season is relatively quiet in the field, and there is no reason to believe that this is going to change next month;
b) Percentage of positive results in wean to market is decreasing for the fourth consecutive month;
c) Pattern of RFLP detection at ISU-VDL in 2019 is very similar of 2018. The most frequent detected in 2019 is the wild type strain RFLP 1-7-4, followed by vaccine strain RFLP 2-5-2.

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Page 2 – Detection of enteric coronaviruses by rRT-PCR

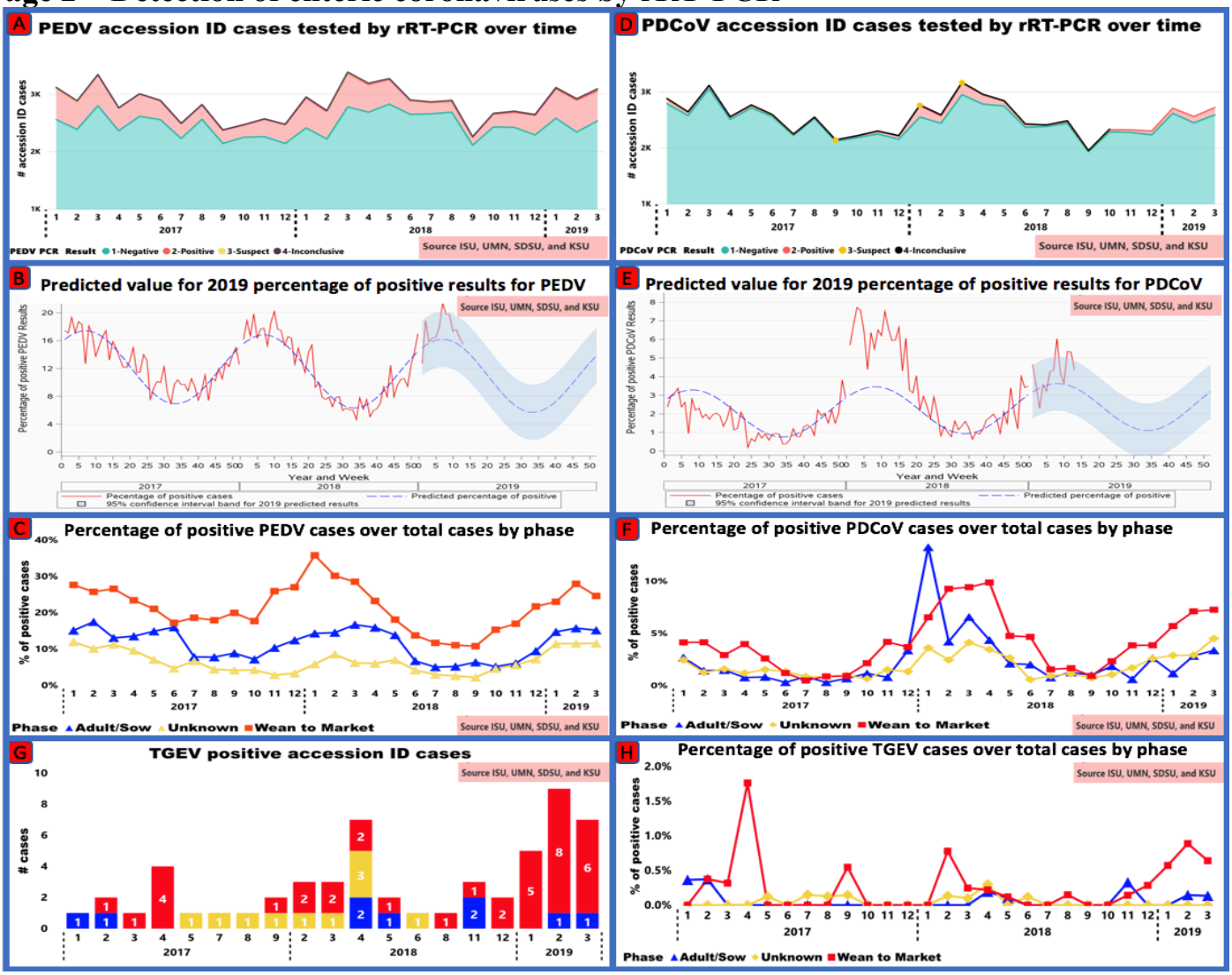

Figure 2. **A**: results of PEDV rRT-PCR cases over time. **B**: expected percentage of positive results for PEDV by rRT-PCR and 95% confidence interval for 2019 predicted value. **C:** percentage of PEDV PCR-positive results, by category over time. **D**: results of PDCoV rRT-PCR cases over time. **E**: expected percentage of positive results for PDCoV by rRT-PCR and 95% confidence interval for 2019 predicted value. **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:

a) Level of detection of PEDV by PCR returned for within expected values at the end of March 2019;
b) Level of detection of PDCoV by PCR was above expected for week 11 and 12 (10 to 23 of March), and was driven by increased detection in all age categories;
c) Number of TGE cases detected as positive were lower in March when compared with February;
d) Based on comments from the advisory board, this agrees with perception that enteric coronaviruses are cold weather-related pathogens, and there is expectation that they are going to change for a lower level of detection in the next upcoming month;

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Page 3 – Detection of MHP by PCR

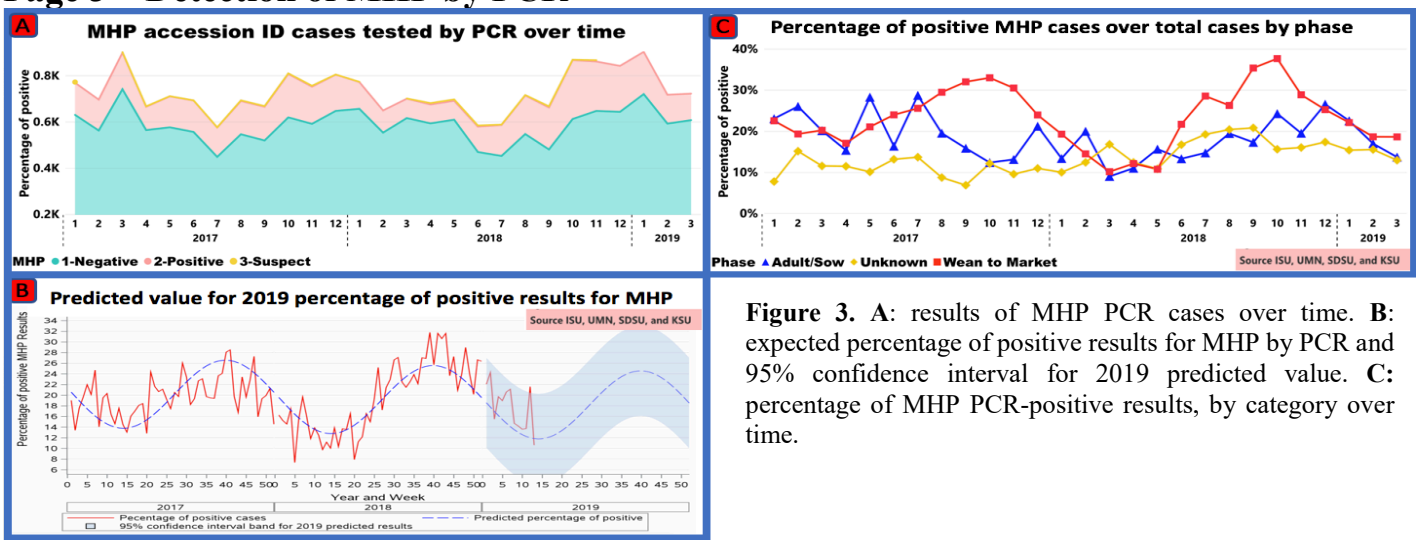
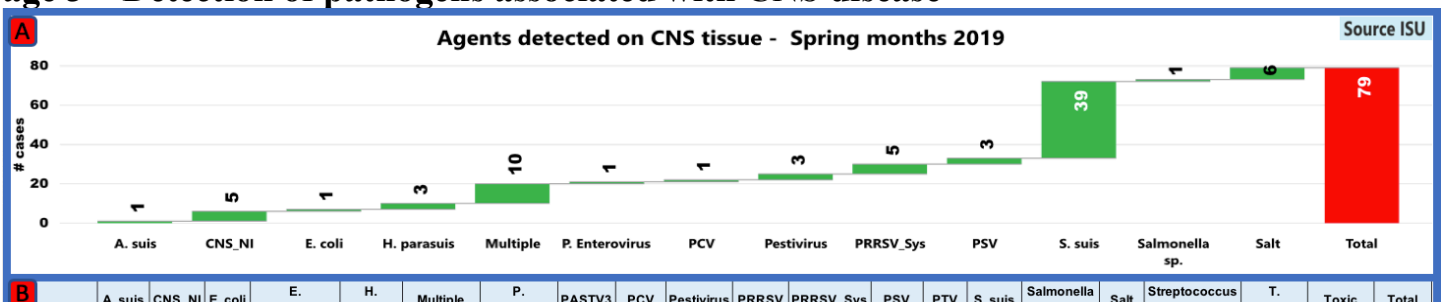


Figure 3. A: results of MHP PCR cases over time. **B**: expected percentage of positive results for MHP by PCR and 95% confidence interval for 2019 predicted value. **C:** percentage of MHP PCR-positive results, by category over time.

Page 3 – Detection of pathogens associated with CNS disease



B

	A. suis	CNS_NI	E. coli	E. rhusiopathiae	H. parasuis	Multiple	P. Enterovirus	PASTV3	PCV	Pestivirus	PRRSV	PRRSV_Sys	PSV	PTV	S. suis	Salmonella sp.	Salt	Streptococcus sp.	T. pyogenes	Toxic	Total
Spring months 2017	3	8	3		13	26	2		4	2	1	17			109		5	2			195
Spring Months 2018	2	13	3		12	27		2	4			17	5		136	1	7	9	9		247
Spring months 2019	1	5	1		3	10	1		1	3		5	3		39	1	6				79

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. **A:** spring months of 2019. **B**: Table for agents detected in CNS tissue during spring months of 2017, 2018 and 2019. Spring months contains results of March, April, and May. 'Multiple agents' represent cases with more than one pathogen detected on CNS tissues.

SDRS Advisory Council highlights:

a) Level of detection of MHP by PCR was above expected for week 12 (17 to 23 of March), and was driven by increased detection in wean to market age category;

b) For March, the first month of the 2019 spring season, there were 6 cases diagnosed as salt intoxication. This was the highest number of cases when compared with March months of 2018, and 2017;

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Page 4 – Detection of pathogens in respiratory tissue over time.

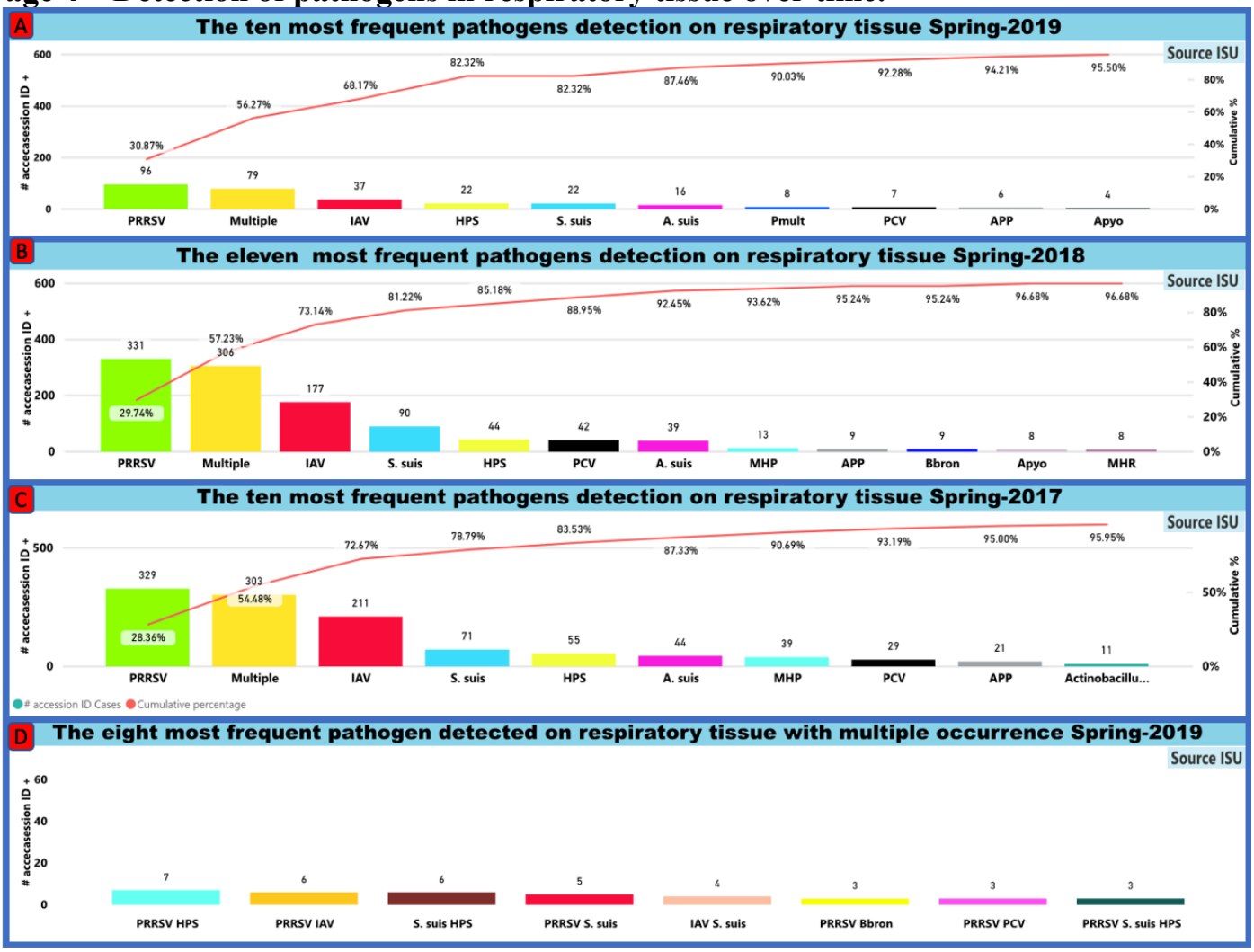

Figure 5. Pathogen detection on respiratory tissues over time. **A**, **B**, and **C** each bar and color indicate a different agent or syndrome. The red line accounts for the cumulative percentage of the bars. **A**: spring months of 2019. **B**: winter spring of 2018. **C**: spring months of 2017. Spring months include March, April, and May. 'Multiple agents' represent cases with more than one pathogen detected on respiratory tissues**. D:** Multiple agents detected in respiratory tissue per accession ID case level. Each bar and colour bar represent a combination of 2 or more agents. Presented results are based on diagnostician interpretation.

SDRS Advisory Council highlights:

a) For March, the first month of the 2019 spring season, 8 cases had *Pasteurella multocida* (Pmult) diagnosed as respiratory insulter. This is higher than the full Spring season of 2018 and 2017;

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Page 5 – Detection of pathogens in enteric tissue over time.

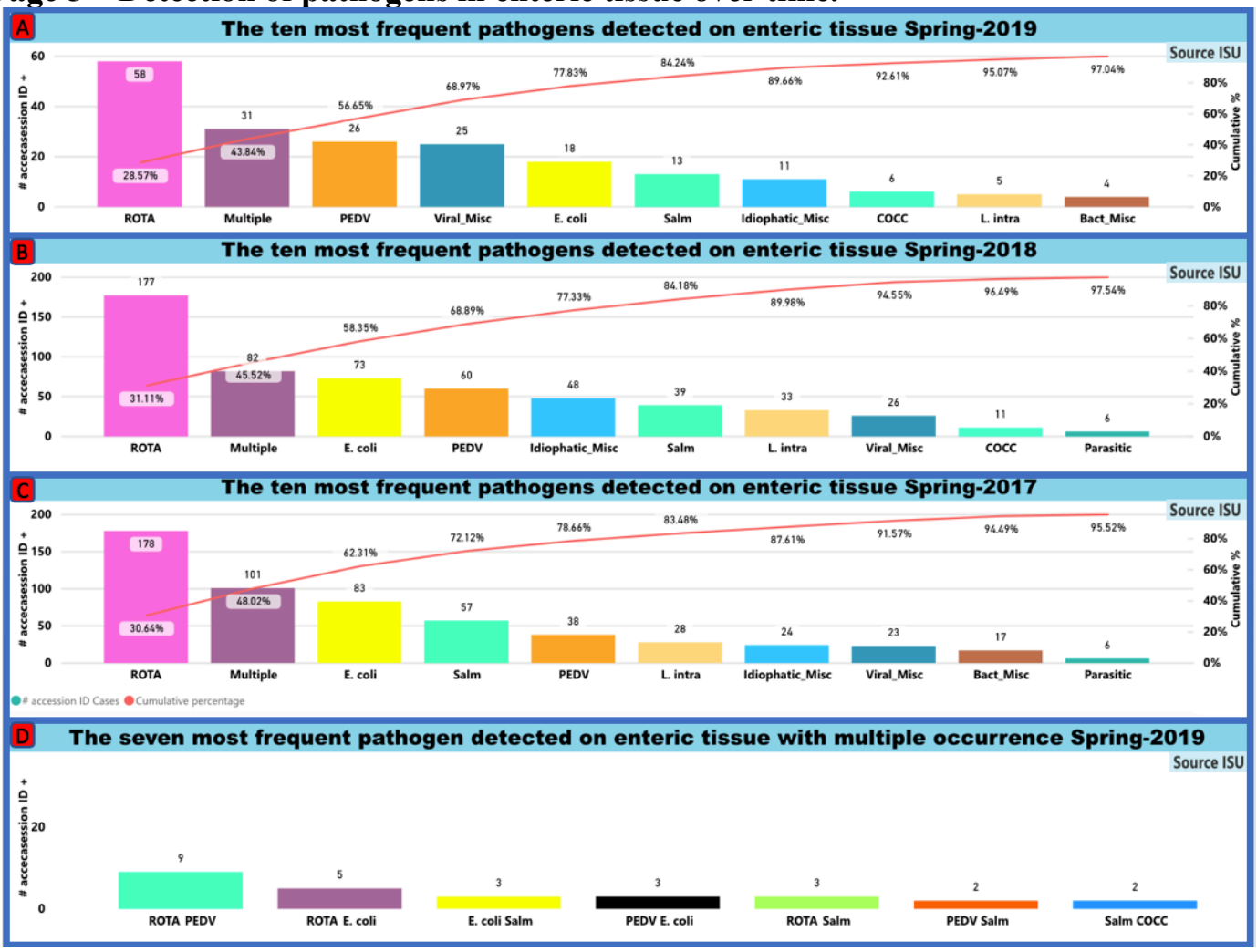

Figure 6. Pathogen detection on enteric tissues over time. **A**, **B**, and **C** each bar and color indicate a different agent or syndrome. The red line accounts for the cumulative percentage of the bars. **A**: spring months of 2019. **B**: spring months of 2018. **C**: spring months of 2017. Spring months include March, April, and May. 'Multiple agents' represent cases with more than one pathogen detected on respiratory tissues**. D:** Multiple agents detected in enteric tissue per accession ID case level. Each bar and colour represent a combination of 2 or more agents. Presented results are based on diagnostician interpretation.

SDRS Advisory Council highlights:

a) Rotaviruses (ROTA), PEDV and viral miscellaneous infection (Viral_Misc) were the top three insulants in enteric tissue for March, the first month of the 2019 spring season. This detection as insulants was higher than previous March month of spring seasons of 2018, and 2017;

b) Cases with multiple diagnoses reported for Spring-2019 were a combination from the major agents reported individually.

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