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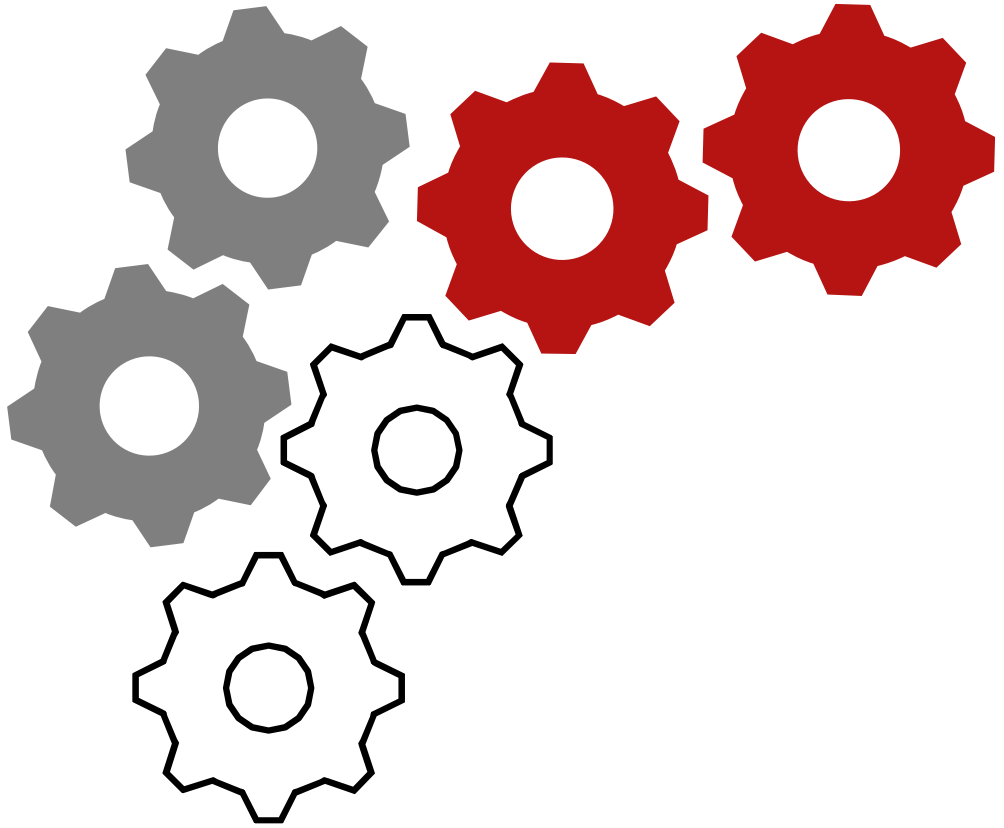
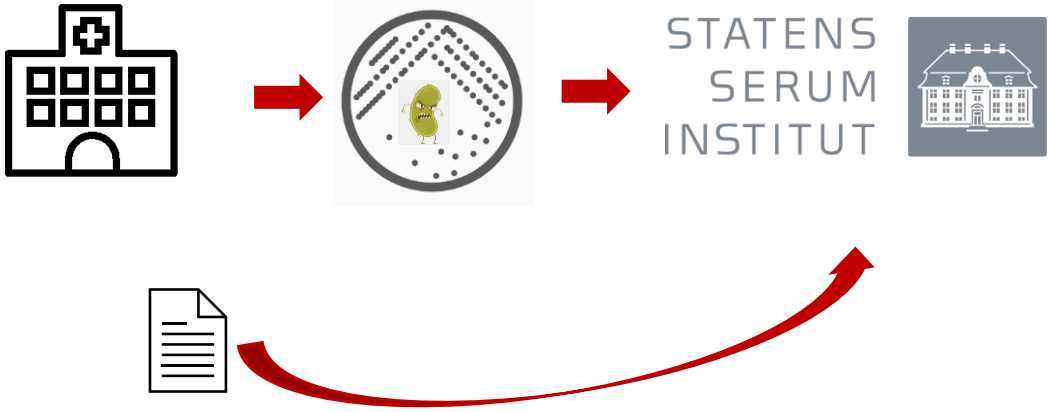


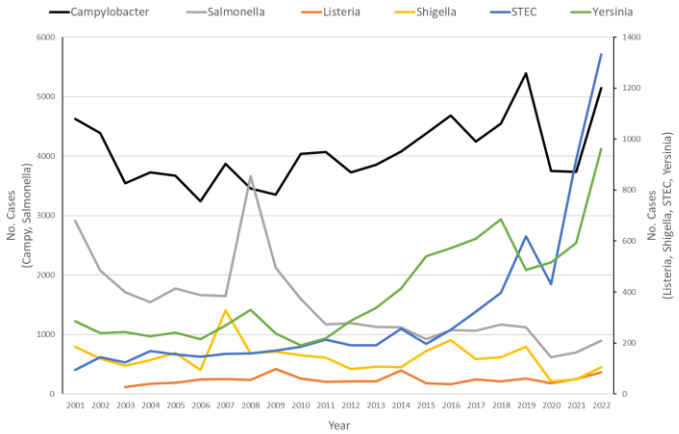
Experience on cross-sector collaboration, Denmark

Susanne Schjørring, Public Health Microbiologist, Statens Serum Institut, Denmark

Surveillance of foodborne pathogens



Case-based surveillance / Isolate surveillance



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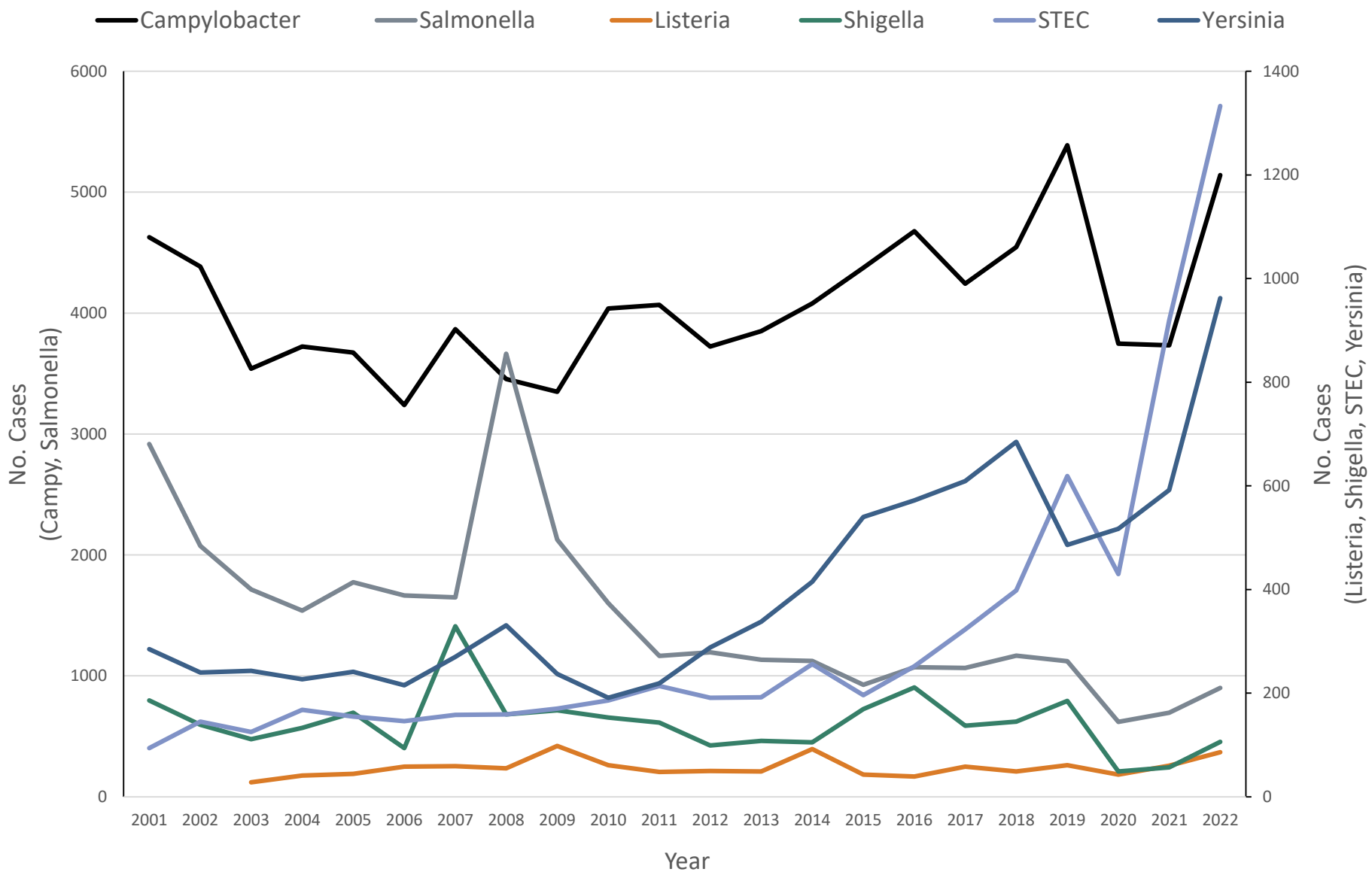

Surveillance of foodborne pathogens

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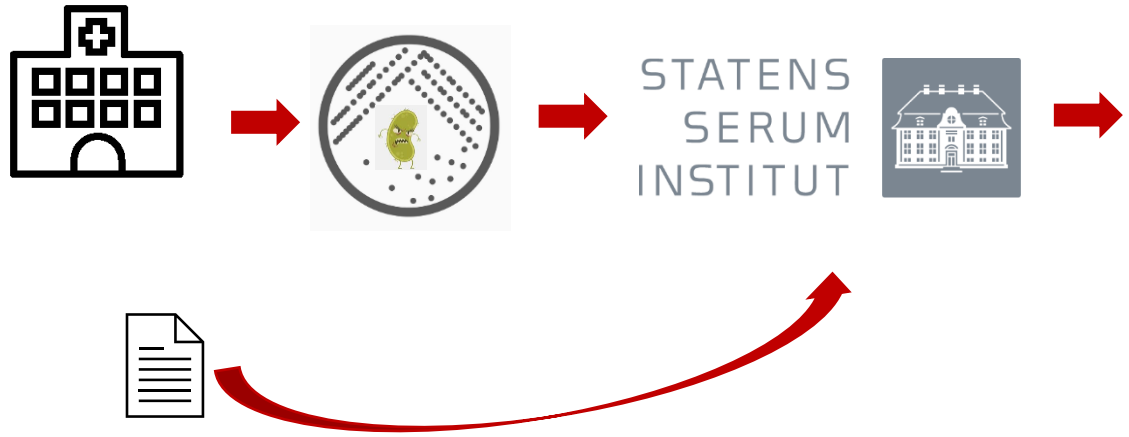

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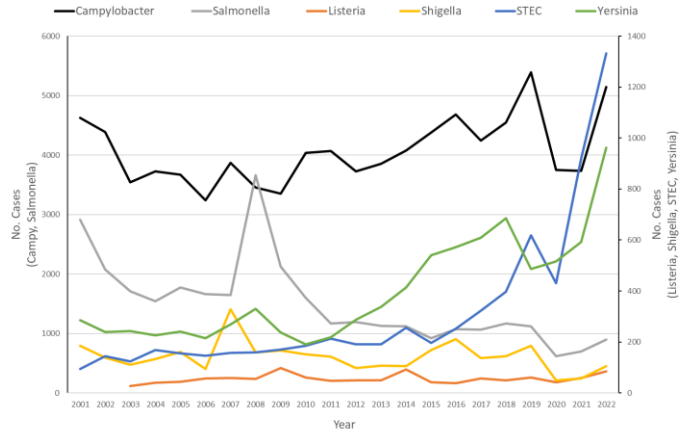

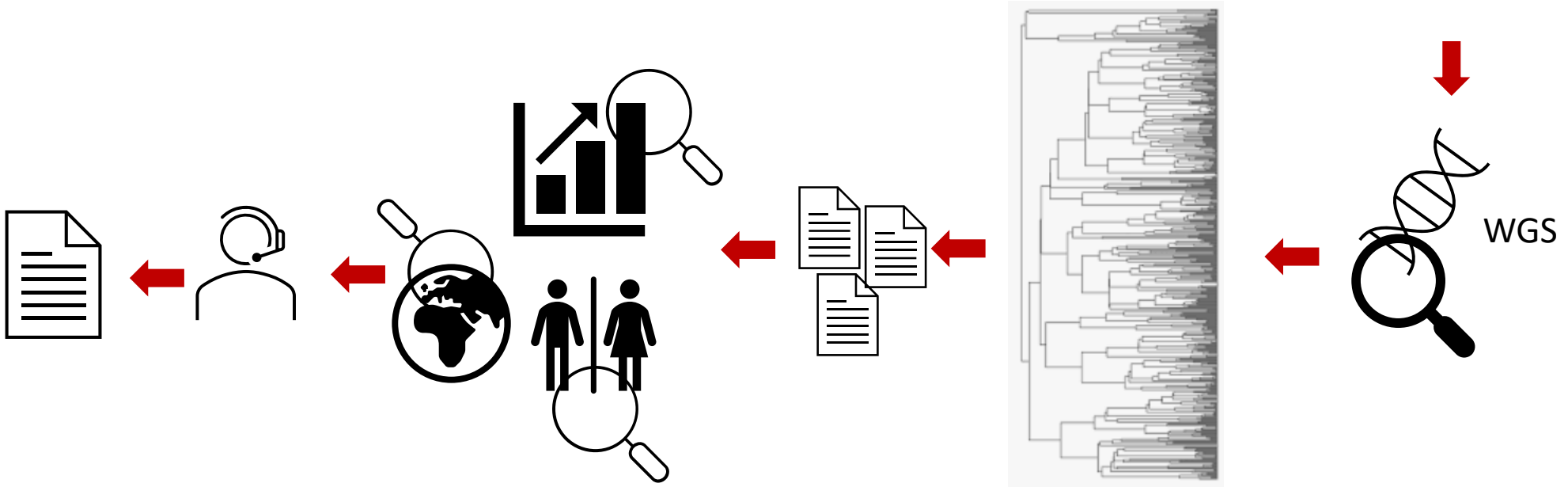

Epidemiologist and Microbiologist at SSI

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Weekly physical meetings

- Every cluster/outbreak signal is discussed in detail

Public Health Sector

- Local laboratories at the hospitals (Diagnostics)
- Statens Serum Insitut (National surveillance)
- Danish Patient Safety Authority (STPS)
- Danish Health Authority (SST)
- Danish Medicines Agency (LMST)

The Centrale Outbreak Group (DCUG)

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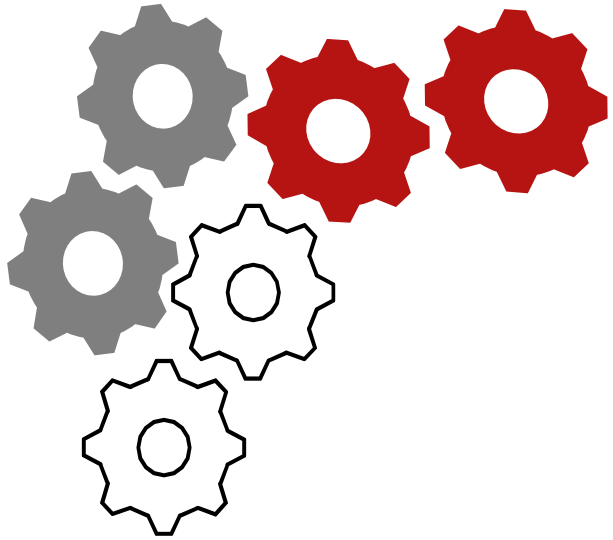
Statens Serum Institut (SSI)

- Microbiologist
- Epidemiologist

Danish Veterinary and Food Administration (DVFA)

- Liaison officer
- Preparedness group
- Zoonosis group
- Microbiologist



National Food Institut (DTU food)

- Epidemiologist
- Secretary

Steering group with representative from all three institutions and Danish Patient Safety Authority (STPS)

DCUG purpose

- Coordinate the investigation
- Stop outbreaks – reduce number of cases
- Prevent new outbreaks
- Enhance information flow about food safety
- Improve surveillance
- Enhance the public belief in the public health sector/food sector
- National collaboration

- Outbreak investigation manual (in Danish)

DCUG meetings

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Weekly meetings

- Fixed agenda and summary
- Every outbreak is discussed in detail

Descriptive epidemiology

- Time, place and gender, etc.
- Interview data
- shopping receipt

Control visits

Microbiology

- Use WGS to identify cluster/outbreaks
- Comparison of sequences of isolates from human and food/environmental samples (by use of WGS – cgMLST and SNP)

Traceback of food items

Standing together

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”One unit”

- Despite the different areas of expertise
- Despite different Authorities

Coordinated press releases related to the outbreak

- Often identical

During interviews

- DVFA staff can talk about the human cases
- SSI staff can talk about the source identified

”2.” DCUG -> KOZO

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Myndighedsarbejdet til koordinering af Zoonoser
~ The authority's work for the coordination of zoonoses

- All other zoonoses beside the Foodborne

KØBENHAVNS UNIVERSITET

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SOFI

national sequence based Surveillance Of Foodborne Infections

- Joint real time sequence based surveillance
- Owned by SSI and DVFA, DTU is collaborative partner
- Legal issues needed to be resolved (GDPR) (Cooperation agreement, Data processor agreement, Shared data responsibility)

Status:

- Automated import of sequences
- Meta-data is imported automatically
- Quality cheek (Bifrost)
- Analysis (Species, subspecies, ST, serotype)
- Approved results is transferred back to the “owners” systems

- Next phase:
  - Resistance (ResFinder)
  - Comparisons (cgMLST, ChewBBACA, ”nearest neighbor” selection / SNP, CSI Phylogeny)
  - Visualization tool (Microreact)

Front-end SOFI (meta data - human)

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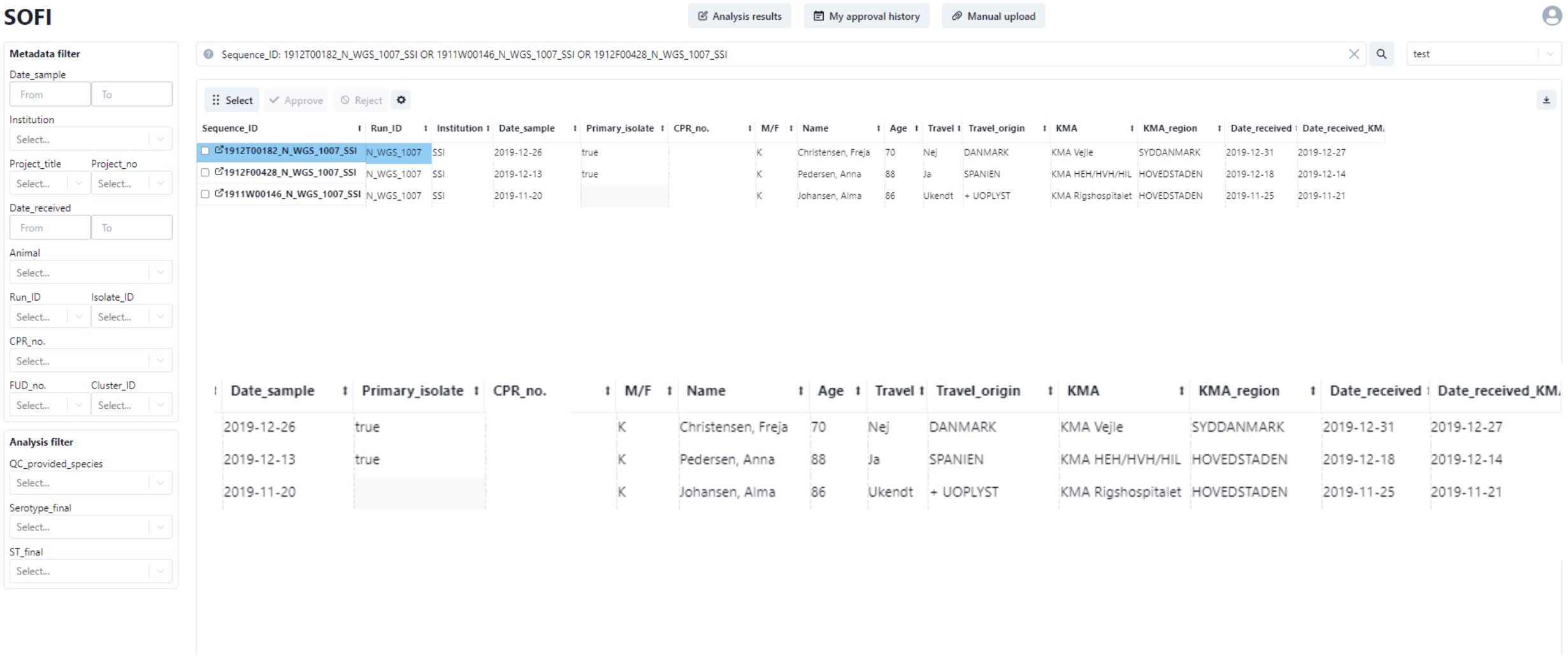

Front-end SOFI (meta data - DVFA)

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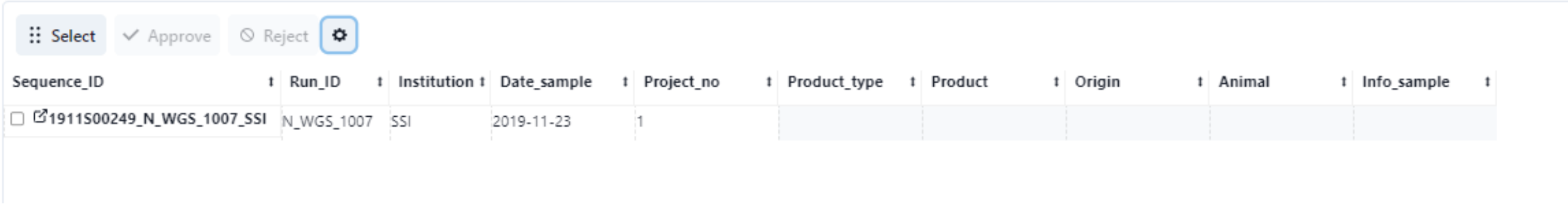

+
CHR (Crew)
Aut no. (Number of authorized companies)

Front-end SOFI (QC data)

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Select | Approve | Reject

Sequence_ID	QC_final	qc_action	QC_failed_tests	QC_provided_species	QC_DB_ID	QC_genome1x	QC_genome10x	QC_Gsize_diff1x10	QC_avg_coverage	QC_ambiguous_sit	QC_num_reads	QC_main_sp_plus_	QC_unclassified_re	QC_
1912T00182_N_WGS_1007_SSI	A	OK		Salmonella enterica	Salmonella enterica	4801964	4801964	0	80.18386622640236	436	0	0.9891135709726657	0.058910014453914453	
1912F00428_N_WGS_1007_SSI		supplying lab	Atypical genome size (x1): d	Campylobacter jejuni	Campylobacter jejuni							0.9961916135520616	0.0238644902492071	
1911W00146_N_WGS_1007_SSI	A	OK		Campylobacter jejuni	Campylobacter jejuni	1713048	1713048	0	572.1356255049479	199	0	0.988238382206337	0.023964794935577257	
2009T00235_N_WGS_1002_SSI	A	OK		Salmonella enterica	Salmonella enterica	4773969	4773969	0	50.78009367048676	5055	0	0.9975581306750664	0.054785415413646546	

Front-end SOFI (ST ..)

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Select | Approve | Reject

Sequence_ID	ST	ST_final	ST_alleles	Species_final	Subspecies	Sero_enterobase	Sero_seqSero	Serotype_final	sero_antigen_seqs	Sero_D-tartrate
1911S00249_N_WGS_1007_SSI	16	16	aroC: 6, dnaN: 7, hemD: 10, hisD: 10, purE: 8, sucA: 10, thrA: 14	Salmonella enterica	enterica	Virchow	Virchow	Virchow	7:r:1,2	CCCCCCCCCCCCCCC

And the work continues …… Next phase (Res & Comparison/ Visualization)

Annual report on Zoonoses in Denmark

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DVFA, SSI and DTU

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https://www.food.dtu.dk/english/publications/disease-causing-microorganisms/zoonosis-annual-reports

DANMAP (Danish Integrated Antimicrobial Resistance Monitoring and Research Programme)

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Use of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from food animals, food and humans in Denmark (DVFA, SSI and DTU)

https://www.danmap.org/

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Thank you

Questions?