One Health Data Reporting, Sharing, and Collaborating

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NEW YORK STATE | Department of Health

New York Integrated
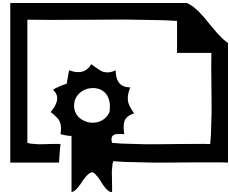Food Safety
Center of Excellence

Cornell University

Cornell Vet Fast Facts

433

D.V.M. Students

139

Ph.D. Students

20

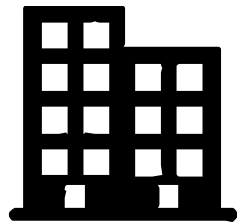# years ranked in **top 1-2** in US News and QS

1,075

Faculty (208) and Staff (867)

6

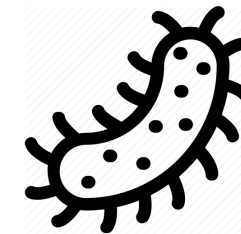Regional clinics or labs

154

Buildings on 546 Acres

>220,000

Diagnostic lab accessions per year

~5,000

Antimicrobial susceptibility tests per year

Strategies for One Health antimicrobial resistance data sharing

- A meeting for animal and public health laboratories and stakeholders
  - Vet diagnostics (academic, state, corporate)
  - State public health and agriculture
  - Researchers
  - Federal agencies (CDC, FDA, USDA, NCBI)

- Sponsored by the CDC-supported New York Integrated Food Safety Center of Excellence

- Held May 3 - 4, 2018 at the Cornell College of Veterinary Medicine, Ithaca, NY
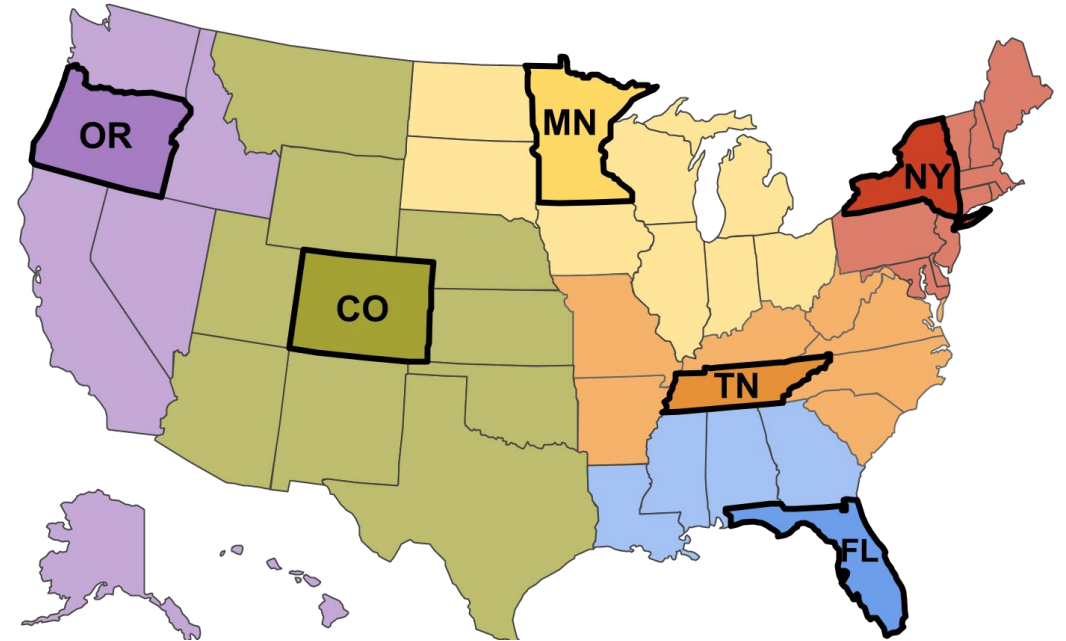
Meeting Goals

1. Assess current capacities for antibiotic susceptibility testing (AST) and whole genome sequencing (WGS), banking isolates, and reporting results.

2. Promote One Health surveillance and facilitate discussion of effective models and best practices for exchange of information.

3. Discuss issues of client confidentiality and barriers to data exporting.

4. Produce a report with assessment of current collection capabilities and gaps.
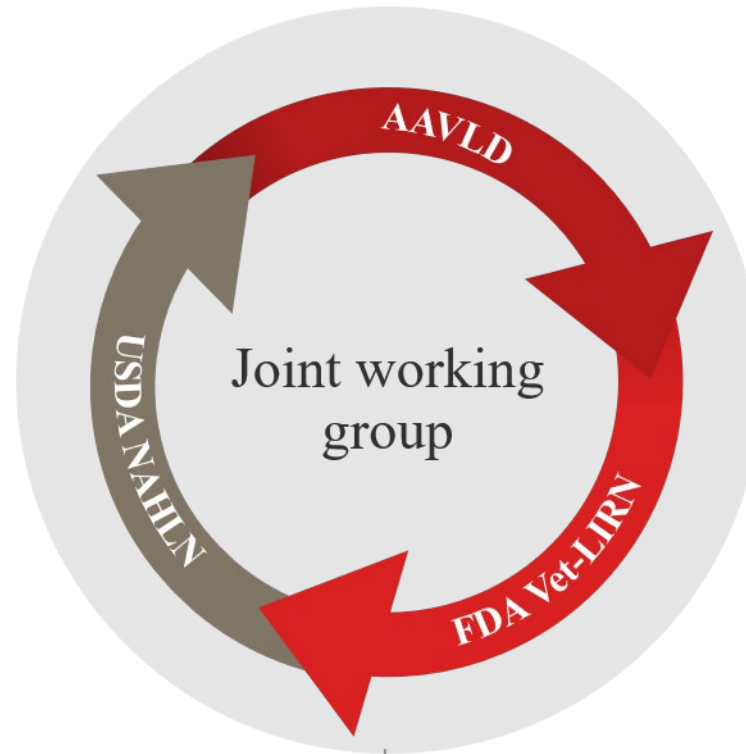
Meeting Highlights

NATIONAL ACTION
PLAN FOR COMBATING
ANTIBIOTIC-RESISTANT
BACTERIA

GOAL 2
Strengthen National
One-Health Surveillance
Efforts to Combat
Resistance

MARCH 2015

Accomplishments
from the **Veterinary
Diagnostics**
Community

Capacity survey (2015-16)

- Published in JVDI (Dargatz et al. 2017)
- Based on ~100,000 ASTs
- E. Coli most common pathogen
- Disk diffusion, broth microdilution

FDA Pilot Study (2017)

- Completed, manuscript submitted
- Focus on **building lab capacity for AST, WGS, and banking**
- Surveillance expanded in 2018-19
- Integrating data with NARMS

USDA Pilot Study (2018)

- Completed, final report pending
- Focus on **secure data messaging**
- Expanding, adding WGS in 2019
- Developing interactive website for data reporting

Minimum metadata – for all species

Data to be included

- Host species

- Sample type (e.g. feces, respiratory, wound swab)

- Collection date

- State of origin (most human isolates lack this information!)

- Case type

- Lab methods

Not included

- Lab accession number

- Referring clinician
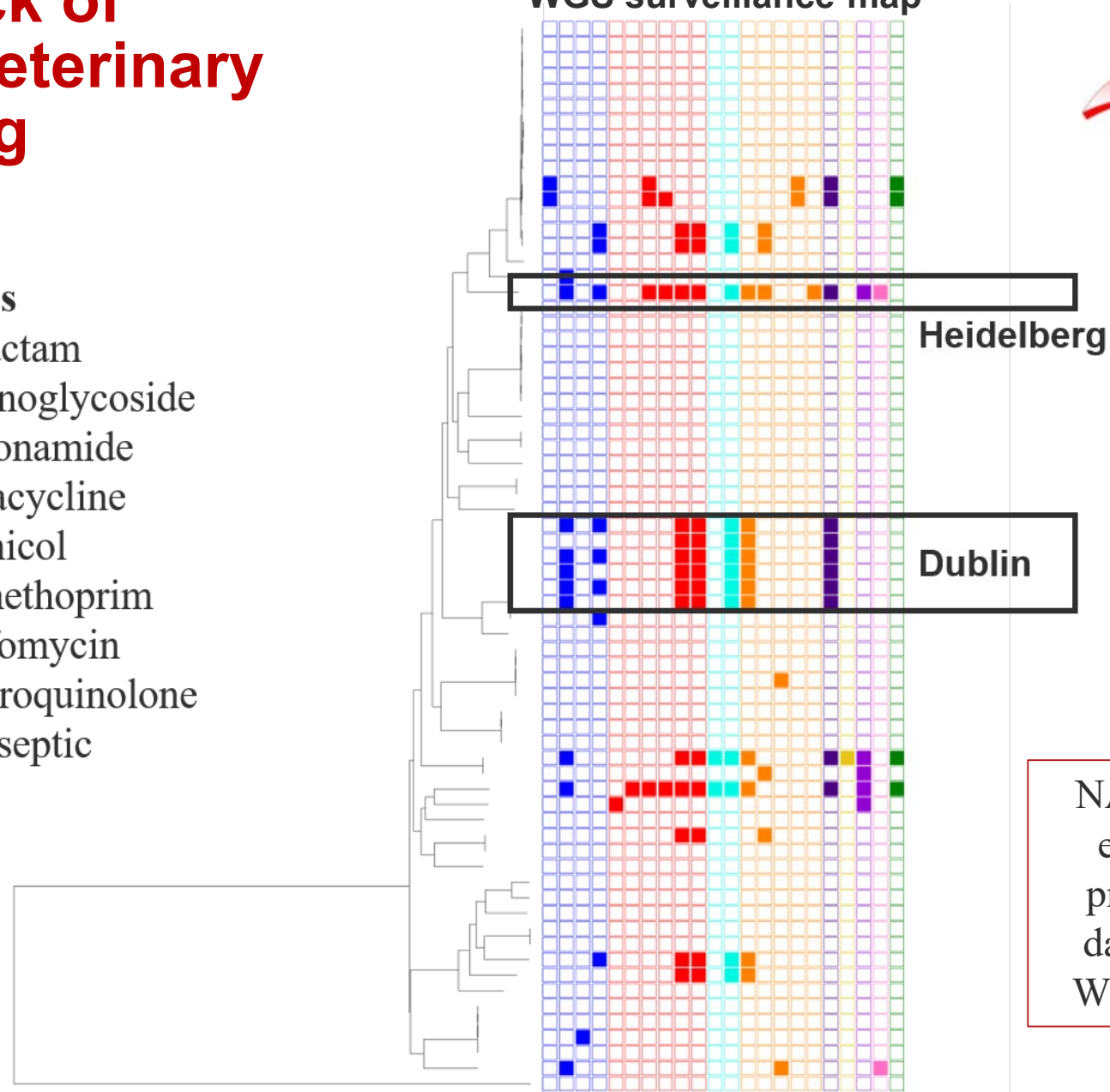
- Animal owner

- Animal name

A tiered system with a 3rd party protector of identifiable information proposed as a possible safeguard for confidentiality

WGS overcomes lack of standardization in veterinary susceptibility testing

2017 national animal *Salmonella* WGS surveillance map

Class
- ■ β-Lactam
- ■ Aminoglycoside
- ■ Sulfonamide
- ■ Tetracycline
- ■ Phenicol
- ■ Trimethoprim
- ■ Fosfomycin
- ■ Fluoroquinolone
- ■ Antiseptic

Heidelberg

Dublin

NARMS and NCBI emerged as "best practice" common databases for AST, WGS, and metadata

FDA Vet-LIRN study, Ceric et al. Submitted
Data available at ncbi.nlm.nih.gov/pathogens/

Most extreme cases highlight importance of companion animal surveillance

E. coli, canine lung (2017)
aac(3)-Iid (gentamicin)
aadA1 (streptomycin)
aph(3")-Ib (streptomycin)
 aph(3')-Ia (kanamycin)
aph(6)-Id (streptomycin)
blaCMY-2 (penicillins, amoxi-clav,
cephalosporins)
blaTEM-1 (penicillins)
catA1 (phenicols)
dfrA14 (trimethoprim)
mph(A) (macrolides)
qacL (disinfectants)
sul2, sul 3 (sulfonamides)
tet(B) (tetracycline)
gyrA mutations (fluoroquinolones)

E. coli, canine lung (2018)
aac(3)-Iid (gentamicin)
aadA1, A2, A5 (streptomycin)
aph(3")-Ib (streptomycin)
 aph(3')-Ia (kanamycin)
aph(6)-Id (streptomycin)
blaEC (cephalosporins)
blaTEM-1 (penicillins)
catA1, cmlA1, floR (phenicols)
dfrA12, 17 (trimethoprim)
Inu(F) (lincosamide)
mph(A) (macrolides)
qacL, qacEdelta1 (disinfectants)
sul1, sul2, sul 3 (sulfonamides)
tet(B, M) (tetracycline)

Data available at ncbi.nlm.nih.gov/pathogens/

Meeting outcomes

Next steps

- Ongoing NY state pilot project
  - Veterinary *Salmonella* antibiogram shared with public health stakeholders
  - Established agreement for sharing de-identified isolates and metadata with our state health department
  - Developing procedures for rapid data release during outbreaks

- Incorporate more animal health resistance data into NARMS and NCBI from public/academic and corporate labs

Suggestions for the next National Action Plan

1. Include data sharing initiatives through the CDC Integrated Food Safety CoEs
2. Expand veterinary diagnostic capacity building through FDA Vet-LIRN and USDA NAHLN
3. Add corporate veterinary labs to federal surveillance networks
4. Support the NCBI Pathogen Detection team to add veterinary pathogens to their pipelines
5. Establish an environmental monitoring network using advanced molecular detection approaches
6. Active surveillance of imported dogs for infectious diseases

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