

# Swine Diagnostic Data Standardization Project

Marisa Rotolo, DVM

# Investigators and Institutions



Rodger Main - ISU VDL



Gary Anderson - KSU VDL



Jane Hennings – SDSU ADRDL



Jerry Torrison & Stephanie Rossow – UMN VDL



Sarah Tomlinson – USDA NAHLN



\* Mike Martin – Clemson University

**\$716,000; 15 month, Infrastructure Development Project**

**Funded via Swine Health Information Center & USDA**

**Commenced fully in July 2016**



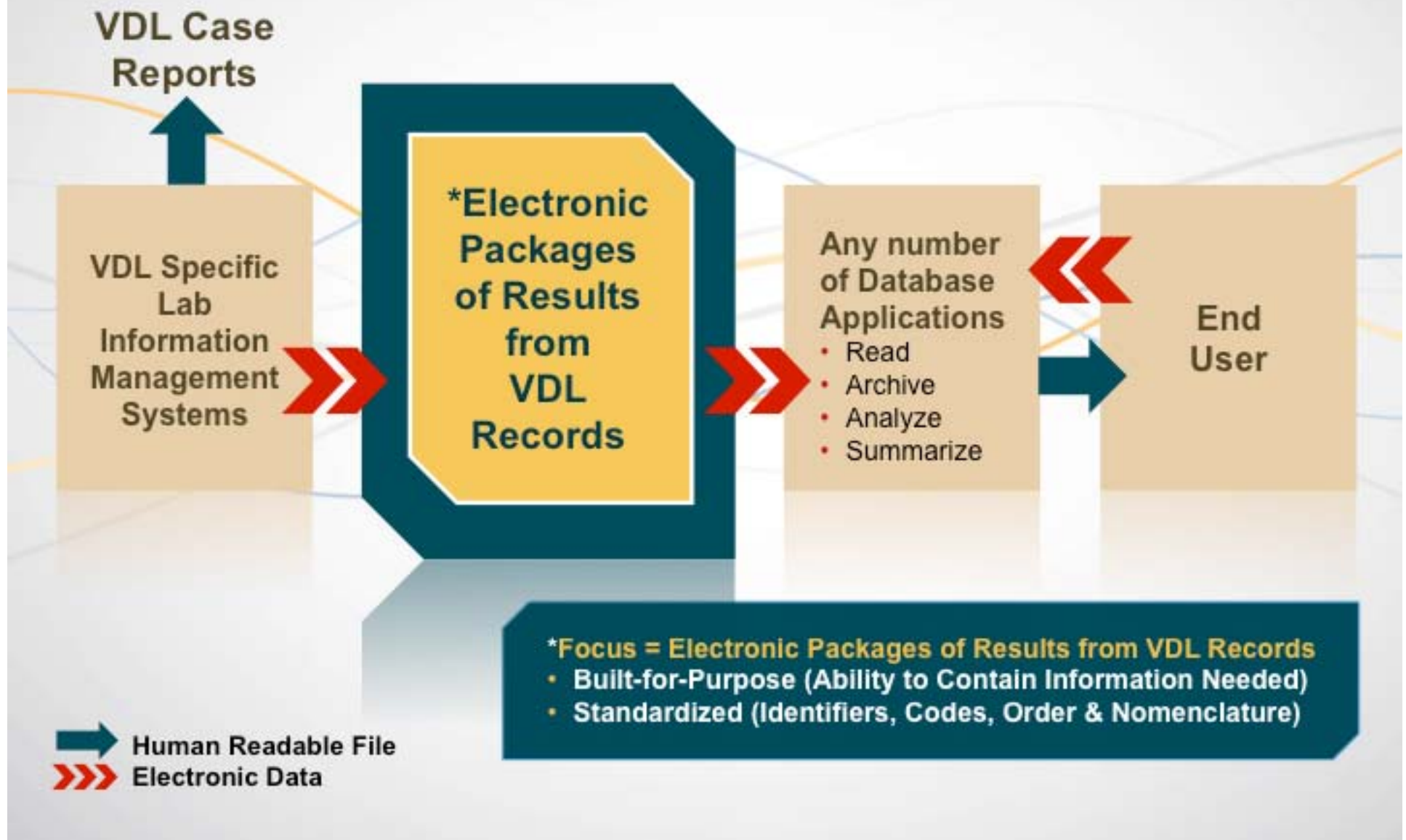
\* Dr. Martin is providing the primary technical guidance and support to this project. Mike is a nationally recognized leader and expert in veterinary diagnostic informatics and HL-7 messaging.

**swine diagnostic data standardization project**

# Objective

***Establish and adopt*** universally recognized ***diagnostic data standards and systems of electronic messaging*** necessary for ***transcending*** inter-laboratory ***connectivity*** and the next generation of ***web-based swine health information management tools*** for both non-program disease and program disease applications.

# Swine Diagnostic Data Standardization Project



# Why Needed?

- Standardization necessary to **make swine veterinary diagnostic records (results) truly fit for the digital era**
- Enhances utility in any number of database applications
  - Electronic packages of VDL results are the same regardless of source
- Aggregate, search, transmit, analyze, or summarize information
  - Operation specific, practice/system specific, regional, national
  - Routine management, continuity of business, or emergency response

# End User

- Animal information management technologies for agriculture agency
  - State or Federal
- Private enterprise
  - Vet clinics, production systems, multi-entity area regional swine health monitoring efforts
- Academic study/research purposes

# Diagnostic Information Standards

- Human Diagnostics → long existed & extensively used
- Veterinary Diagnostics → limited to finite number of reportable disease applications

## Good News:

- Structure for universal standards exists
  - LOINCs (Logical Observation Identifiers Names & Codes)
  - OIDs (Object Identifiers)
  - SNOMED Codes (Systemized Nomenclature of Medicine)
  - HL-7 (Health Level 7) Message Structure
- NAHLN labs have experience using such standards
- Maintenance is relatively minimal once established and being used on routine basis



## Bad News:

- Not broadly developed or used in veterinary diagnostic medicine
- ↑ Upfront work (Informed, Built for Purpose, Highly Collaborative Development & Implementation )

# How Can Labs Communicate Results?

- LOINC
  - Logical Observation Identifier Names and Codes
  - Common language for clinical and laboratory observations
  - Labs can map local tests to a LOINC which allows a third-system to recognize and aggregate test data
- Health Level 7 (HL7)
  - HL7 is a standard used to message data electronically
  - Standards provide a framework for exchange, integration, sharing and retrieval of electronic information
  - Allows for interlab communication



# Scope of this Project

- **Standardizing All Results Reported in Electronic VDL Record**

- Nomenclature, Order, & Components Included
  - Built For Purpose VDL Record (Inclusive)
- 

- **Submission Level Identifiers**

- Submitter, Clinic, Owner, Site, Farm Type, Flow, Lot, Reason for Test, etc.

- **Animal or Sample Level Identifiers**

- ID #, Age, Location, Parity, etc.

- **Test Results**

- Components included in results for each assay/evaluation conducted
- Swine Dx Only

# Methods & Deliverables

- Define a complete list of submission/animal level identifiers, diagnostic assays, test results and analytical/interpretive summary reports
  - Tier I
    - Submission/premises/animal level identifiers and infectious disease test type
  - Tier II
    - Swine associated analytical test results
  - Tier III
    - Swine disease investigation interpretive summary reports and conclusions

# Tiers I, II & III

- Tier I
  - Submission, premises, and animal identifiers
  - Reason for test, vaccination status, etc
  - Nucleic acid, antigen, or agent assays
  - Antibody detection assays
  - Genetic sequencing assays
- Tier II
  - Antimicrobial susceptibility tests, minerals, vitamins, toxins, drugs, nutrients, and blood chemistries
- Tier III
  - Histopathological descriptions, diagnostician summary comments, diagnostic codes

# Deliverables

1. Universally recognized ***electronic message schema*** that is comprehensive enough for both non-program and program disease applications.
2. Well-vetted ***formulary of registered LOINC***s for the full-complement of diagnostic assays, test results, and interpretations commonly used in swine diagnostic medicine.
3. Demonstrate capabilities to ***proficiently synthesize and electronically message*** the full-spectrum of swine diagnostic data for either premises-specific or aggregate data health monitoring applications.

# Swine Diagnostic Data Standardization Project



Interstate Construction, 1958



Current Day

Developing infrastructure to help harness the capabilities that the digital age will have to offer for years to come

