INTRODUCTION

All laboratories have established processes for sample submission; these processes are designed based on their day-to-day, routine submission volume. However, during outbreak situations, these established processes may not be appropriate for the increased volume of samples and demands of ongoing response activities.

In particular, the processing and messaging of large volumes of laboratory results into the Emergency Management Response System 2.0 (EMRS2)— the USDA APHIS Veterinary Services (VS) system of record in any foreign animal disease (FAD) outbreak— is problematic for any National Animal Health Laboratory Network (NAHLN) laboratory (and other laboratories) that have not prepared and tested these processes. Without electronic messaging processes, results are not automatically matched to the corresponding investigation and premises, which leads to significant backlogs and can delay appropriate response actions. Thirteen NAHLN laboratories electronically messaged avian influenza diagnostic results during the 2014–2015 highly pathogenic avian influenza outbreak. Currently, there are 47 laboratories that are approved to message avian influenza results, which demonstrates important progress. While significant improvements have been made, particularly for high-volume laboratories in livestock/poultry dense States, most NAHLN laboratories do not currently message all laboratory results for all FADs.

Choosing to implement any of the following recommendations will enhance the efficiency of sample submission and information management processes; however, their effects are synergistic, so opting for all four recommendations will provide the best outcome. Whereas the implementation of these recommendations necessitates changes in both processes and culture, the benefits of maximizing automated processes include decreasing the need for additional resources and minimizing errors.

> The messaging of results, associated transfer, and subsequent matching of large volumes of accurate results to investigations and premises in EMRS2 is critical for detection of new disease cases, surveillance activities, and continuity of business operations.

RECOMMENDATION 1: MESSAGE ALL RESULTS FOR ALL FOREIGN ANIMAL DISEASES FROM NAHLN LABS.

Benefits

Messaging allows the real-time transfer of large volumes of results without any additional data entry. Subsequently, laboratories are free to concentrate on testing rather than answering questions about specific results. By eliminating the need for extra data entry, the information is not only more accurate, it is rapidly available and enables automatic notifications on positive results for immediate action.

Challenges

Messaging requires the lab to have a Laboratory Information Management System (LIMS) that is capable of messaging. In addition, staff will require some Information Technology (IT) expertise, and the lab will need to bear the associated cost of both the system and the appropriate personnel/expertise to set up.

RECOMMENDATION 2: USE PRE-PRINTED LAB SUBMISSION FORMS WITH BARCODED PREMISES ID, AND VALIDATED ADDRESS AND FARM NAMES FOR ALL COMMERCIAL SURVEILLANCE AND RETURN BACKYARD PREMISES VISITS.

Benefits

Pre-printed lab submission forms eliminate the confusion of which samples are associated with which premises. This allows for the messaging of lab results and automatic linkage of the results with the investigation that has been entered into EMRS2. The alternative, sifting through spreadsheets with hundreds or thousands of laboratory results and trying to match them to the correct premises, is extremely time consuming and neither an efficient or effective way of doing business. Pre-printed forms can be formatted and produced as PDF for any premises in EMRS2, then distributed to companies for ease of circulation to their producers. Sample types, reasons, and other information can be pre-printed on the form and further reduce data entry requirements, while improving data accuracy.

Challenges

Laboratories typically have their own forms which they prefer to use for lab submissions. In addition, companies must be willing to not only distribute the forms, but ensure their producers are trained in using the forms. If a premises does not have a National Premises Identification Number (PIN), then it cannot make use of pre-printed forms until the PIN has been assigned and obtained.

RECOMMENDATION 3: USE PRE-PRINTED PAIRED BARCODE STICKERS: ONE FOR THE SAMPLE CONTAINER, AND ONE FOR THE LAB SUBMISSION FORM ON THE LINE FOR THE MATCHING SAMPLE.

Benefits

Use of barcode stickers has been demonstrated to ensure and facilitate the accurate entry of sample identification and automated matching of the sample/premises to the associated result in EMRS2. For commercial premises and return backyard visits, barcodes are scanned when the sample arrives at the laboratory and provides a consistent, legible method of sample identification so results are associated with the correct premises. Barcode stickers are an inexpensive, standard inventory control tool that eliminates another opportunity for human error in a fast-paced, rapidly changing outbreak situation.

Challenges

In order make the most impact in a large outbreak, barcoding must be implemented (i.e., barcodes provided) in advance of the outbreak so samples are immediately matched to their submission form/premises. Barcodes must be widely distributed to producers; there are four

identical barcodes in a set. One barcode sticker goes on the sample, one on the NVSL Lab submission for (VS 10-4, one on the State Lab Submission form, and one is extra. Labs also apply their own internal barcodes for sample tracking and are sometimes resistant to adding a barcode for other uses.

RECOMMENDATION 4: USE EMRS2GO MOBILE APPLICATION OFFLINE FOR ALL BACKYARD SURVEILLANCE.

Benefits

Using EMRS2GO eliminates the need for additional data entry for backyard surveillance. It provides the ability to show progression of backyard surveillance, including premises without livestock/poultry, in nearly real-time. Tablets and laptops can be used offline and synced with EMRS2 when an internet connection is available. Near the end of the day, applicable labs can be notified of the volume of samples to expect based on the data in the EMRS2GO system. EMRS2GO has been demonstrated to save hundreds of labor hours by preventing the need for additional data entry and avoiding transcription errors from paper records.

Challenges

EMRS2GO must be downloaded and installed on tablets or laptops, which requires IT support. Initial training is typically required prior to use. EMRS2GO is not available for smartphones.