ATTACHMENT 13

Proposed Highly pathogenic H5N1 avian influenza Data Integration, Data Management and Spatial Modeling

Data Standards

The Wildlife Disease Information Node (WDIN) system will accommodate a common set of data standards as developed by the Interagency HPAI Early Detection Working Group. It is expected that these standards will be compliant with those under consideration for use in the National Animal Health Laboratory Network (NAHLN). The needs for standards utilized in other systems (e.g. USGS Bird Banding Laboratory) will also be addressed. The WDIN will provide a data schema of required fields and elements that will be used through the system, as defined by the Working Group and collaborators in the data management field.

Data Security

Security for the system will be achieved through various checkpoints throughout the application. There will be several access roles each user can be assigned or revoked ("data entry", "data edit", "data verification", and "data administrator"). Users can be granted any number of the roles available. Without sufficient access, the user will be rejected from entering that portion of the system. Depending on access, a user's roles may include: (1) Data entry; (2) Data edit; (3) Data verification, and (4) Data administrator.

Data sharing will be achieved alongside the security measures. Each user/institution will have the ability to grant or revoke access to their data in agreed upon levels of access, and this access will be determined by the WDIN in collaboration with the Working Group. WDIN is envisioning low and high level access roles that can be granted to partner institutions.

Data System Environment

These are the existing components of the system proposed for HPAI data management:

- Java J2EE environment 1.4.2 (HTML, javascript, JSP) for the web application;
- Microsoft SQL (database) to house the entered data;
- Apache 2 (web server);
- Tomcat 5; (application server);
- ESRI ArcIMS 9 (web-enabled mapping);
- ESRI ArcSDE (spatial data engine component on top of MS SQL).

To keep the system up-to-date and fully functional, additional components, such as Rhapsody/Chameleon or another HL7 messaging software system will be needed to accommodate the transfer and receipt of HL7 messages.

Data Entry

Because of the multiple agencies and groups involved in sampling, there may be different procedures for field data capture and diversity of abilities and mechanisms for entering these data into an electronic system. The data management platform must accommodate these differences, and allow data entry to proceed in an efficient manner. WDIN is exploring the following options for data entry. Some or all of these may be implemented depending on user needs: (1) Direct web access; (2) File transfer; (3) Optical Mark-Read data forms; or (4) Handheld/PDA. WDIN will work with users whose preferences for data entry may change over time.

Data Access and Mapping

Based on the security protocols described above, and within the access guidelines determined by the Interagency Working Group, through the web portal, partners will be able to view all data that has been entered in a number of ways. Data can be browsed in entirety, or filtered by various parameters (e.g. species, sex, location). Standardized reports for individual partners, as well as grouped data will also be available. If permission has been obtained, subsets of raw data could also be downloaded.

Through the use of an interactive mapping tool (ArcIMS), maps will be available both on-line and printable. These maps are created on demand and can show whatever data fields the user desires, overlaid on a wide range of backgrounds, such as roads, political boundaries, species populations, topography, etc.

Spatial Analysis and Modeling

Once surveillance data has been collected and mapped, they can be used in spatial analysis both to assess the progress of the surveillance effort, and if HPAI is detected, observe the course of the disease and potentially model its spread, providing guidance for operational staff undertaking control and eradication measures. As the proposed WDIN Interagency Data Management System already contains a Geographic Information System (GIS) component, this process can be easily instituted. WDIN will work closely with the USDA APHIS Centers for Epidemiology and Animal Health (CEAH) to integrate GIS surveillance, mapping and modeling tools for application to HPAI analysis and response.