Mobile Technologies: New tools to improve diseases surveillance and reporting

Julio Pinto
Animal Health Officer
FAO
THE CONTEXT

- Lack of sensitivity of surveillance programs
- Lack of timely reporting of disease events
- Underreporting
- Emerging diseases and further spread of endemic
- Proliferation of mobile technologies and access in remote places
SMS Gateway-Bangladesh

- Syndromic surveillance for poultry diseases
- Detection of HPAI in 260/487 subdistricts
- FAO project was funded by USAID
- SMS messages
- Since October 2008, 80% of outbreaks detected through SMS Gateway
- Linked to action: detection to desinfection (4.8 days v/s 1.5 days)
DLS T 4000 D 26 S 34 C

D indicates the number of birds reported dead at the time of the SMS

T indicates the Total number of birds in the poultry farm

S indicates the number of birds still sick in the poultry farm at the time of the SMS

In the first SMS, the alphabet here indicates the kind of farm, with B for Backyard and C for Commercial. In the second SMS, it would be either N (No danger) or S (Suspicion of H5N1 HPAI)

Tells the mobile service provider to redirect the SMS to FAO’s server
260 out of 487 sub-districts.
- 780 Community Animal Health Workers (CAHW)
- 88 Veterinary Surgeons
- 260 Upazilla Livestock Officers
DPT Pilot Studies

- SADC countries
- Namibia, Zambia, Mozambique and Tanzania

- Livestock Committee SADC recommended its application by member states (15)

- Project supported by African Development Bank to implement the technology.
Digital Pen Technology

- 2006 in Southern Africa
- Digital pen that transmitt data through blue tooth technology to a central database.
- A paper form (disease surveillance form) with a special dot pattern to capture instructions in prescribed areas.
- Data is transmitted via GPRS/EDGE/3G
- A server which host the data
- Data quality check (editing, validation and confirmation)
- Priority diseases for SADC/LIMS (FMD, RVF)
FAO’s Global Disease Information System (EMPRES-i)

Public website
(English, French, Spanish)

http://empres-i.fao.org

Internal website

http://empres-i.fao.org/empres-i3g/
FMD West Eurasia Database

• Secure website, password protected
• Armenia, Azerbaijan, Georgia, Turkey: outbreak and vaccination data input monthly
• Automated analysis: charts and maps
• Summarized data can be seen by all countries (maps)
EMPRES-i Event Mobile Application (EMA)

EMPRES-i EMA allows:

- To enter epidemiological data from the field.
- To visualize on a map the location of previous outbreaks available in the EMPRES-i database which occurred close to the geographical location of the user (“Near me”).
- To access from the mobile to epidemiological information of an outbreak
- To generate early warning notifications at national/regional level through e-mail notifications.
EMPRES-i - workflow

DATA ENTRY: Data are entered manually (computer and/or mobile phone).

MOBILE PHONE APPLICATION: To provide and/or access disease outbreak information.

VALIDATION: Data are verified and validated before being officially published by FAO.

MY EMPRES-i: User preferences set up for different sections including disease outbreaks by selecting a disease, period and a geographical area, CCS, laboratories and newsletters.

INTERACTIVE MAP: Access to epidemiological and laboratory information from an outbreak location.

AUTOMATED DATA UPLOAD: A special Excel file application facilitates the upload of large amounts of data into the system.

http://empres-i.fao.org
EMA-i for Android
EMA-i for Android

Diagnosis Date: 05/07/2013
Diagnosis Status: Suspected
Disease: Influenza - Avian
Disease Subtypes: H5N1 HPAI
Diagnosis Source: National authorities

Disease:
- Foot and mouth disease
- Glanders
- Highly pathogenic avian influenza
- Infectious bovine rhinotracheitis
- Influenza A (H3N2)

Select Disease Subtypes:
- H3N1
- H4N1
- H5
- H5N1
- H5N2

Done
Cancel
To attach one or more photos (clinical signs, lesions etc..), when collecting and sending information for an outbreak.

Additional information and Photos
• To visualize on a Map geo referenced data (markers) of outbreaks available in the database

• Selection criteria: time, distance, disease

• Details of an outbreak are also available under a “Report Format”

EMA-i - Event Near Me function
How to pilot EMPRES-i – EMA

- Essential requirements:
  - Assessment of national needs for disease surveillance and reporting;
  - Agreement on data property between national authorities and FAO;
  - Set-up a workflow;
  - Equipment: Smartphones, Computers;
  - Internet: Operator;
  - Training
  - User guidelines;
  - Standard Operational Procedures (SOPs);
  - FAO assistance at national level (procurement, logistic…);
EMPRES-i – EMA: a pilot activity in Uganda
One Health Project (OSRO/GLO/104/IRE)

Background:
• Follow-up activity of the national workshop on information systems and innovative tools for disease surveillance and reporting held in Entebbe on 25 January 2013.

• Part of the Disease intelligence component of the One Health Project (OSRO/GLO/104/IRE) which consist in developing tools to improve disease surveillance, reporting and risk management at the human/animal/ecosystem interface.

Objective:
To strengthen the existing disease reporting system in Uganda
EMA-i pilot in Uganda

• Time period:
  - January 2013 - July 2013: Preparation of the pilot (Districts, Guidelines, SOPs, Procurement, Training material…)
  - July 2013 –December 2013: Implementation of the pilot in Uganda (Delivery of equipment, Training)

• Key players:
  - National Animal Disease Diagnostics and Epidemiology Center (NADDEC) (5)
  - District Veterinary Officers (10)
  - Chief Veterinary Officers
Workflow

FINAL REPORT

- Decision Makers (CVO)
  - Automatic E-mail

VALIDATION of REPORTS

- MAAIF/NADDEC
  - EMPRES-i platform - PC

REPORTS (DRAFT)

- District Veterinary Officers (DVOs)
  - Smartphone - EMA

Others users
- Automatic E-mail

DVOs (10)
- Automatic E-mail
Dear NADDEC “Acceptance” Team,

A disease report was submitted to NADDEC. A summary of the report is available below.

Thank you,
NADDEC Team

*******************************
** Action: VALIDATED **
*******************************

** Disease:** Coccidiosis

** Locality:** Nyamarwa village, Nyamarwa subcounty, Kibaale district (Hubende)

** Diagnosis Information **

** Status:** Suspected

** Disease:** Coccidiosis

** Serotype:**

** Source:** National authorities

** Epidemiological Information **

** Species Affected:** Domestic chicken

** Humans Affected:** No

** Geographical Location **

** Latitude:** 0.615347

** Longitude:** 31.9208

** Admin:** Bugala

** Admin2:** Mubende

** Country:** Uganda

** Region:** Africa

** Outbreak ID:** 181000

** Confidentiality:** Yes

** Workspace:** EMPRES-1

** URL:** http://empres-i.fao.org/empres3gr/

** Inserted:** Wed 18-10-2013 17:06:31

** Inserted by:** Amasya, Moses

** Last modified:** Fri 01-11-2013 11:53:48

** Last modified by:** Sserugga, Joseph

** Validated:** Fri 01-11-2013 0:00:00

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E-mail with disease event report generated from EMPRES-i
EMPRES-i EMA – Mapping/Near me

Event Overview

Data Entry Information
- Last Saved On: n/a
- Sent On: n/a
- Sent through: n/a

General Information
- Locality Name: Umbria (at 124.911 Km)
- Latitude: 43.0
- Longitude: 12.5
- Reporting Date: 19 Feb, 2006
- Observation Date: 19 Feb, 2006
- Surveillance Type: Not specified
- Infection Source: Not specified
- General Comments: n/a
- Diagnosis Information: 

Map of Uganda showing locations with pins.
EMA-i: a pilot activity in Uganda

EMPRES-i EMA pilot in 10/112 districts:

Nakasongola, Mbale, Rakai, Sironko, Busia, Lyantonde, Isingiro, Masaka, Mukono, Mityana, Kibaale.
Training

- In Kampala:
  - NADDEC
  - DVOs
  - CVO

- In Entebbe:
  - NADDEC
Diseases to be reported from the field ...it is a country selection, the list is flexible!!

- Foot and Mouth Disease
- African Swine Fever
- Contagious Bovine Pleura Pneumonia
- Peste des Petits Ruminants (PPR)
- Lumpy Skin Disease
- New Castle Disease
- Anthrax
- Rabies
- Brucellosis
- East Coast Fever
- Anaplasmosis
- Babesiosis
- Heartwater
- Gumboro
- Trypanosomiasis
- Black quarter
Other ...
Challenges

- Assessment of the tool
- Ownership of data, validation and use of the data to support official reporting to regional systems/OIE
- Sustainability/investment
- Purposes/quality of data collected
- Linkages with action (Lab.diagnosis) and disease control
- Structured v/s unstructured data collection
- Analysis of data and epidemiological understanding of disease emergence and spread for action
- Incentives for reporting