Mobile Technologies: New tools to improve diseases surveillance and reporting

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Animal Health Officer

FAO

THE CONTEXT

- Lack of sensitivity of surveillance programs
- Lack of timely reporting of disease events
- Undereporting
- 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)

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

DLS T 4000 D 26 S 34 C

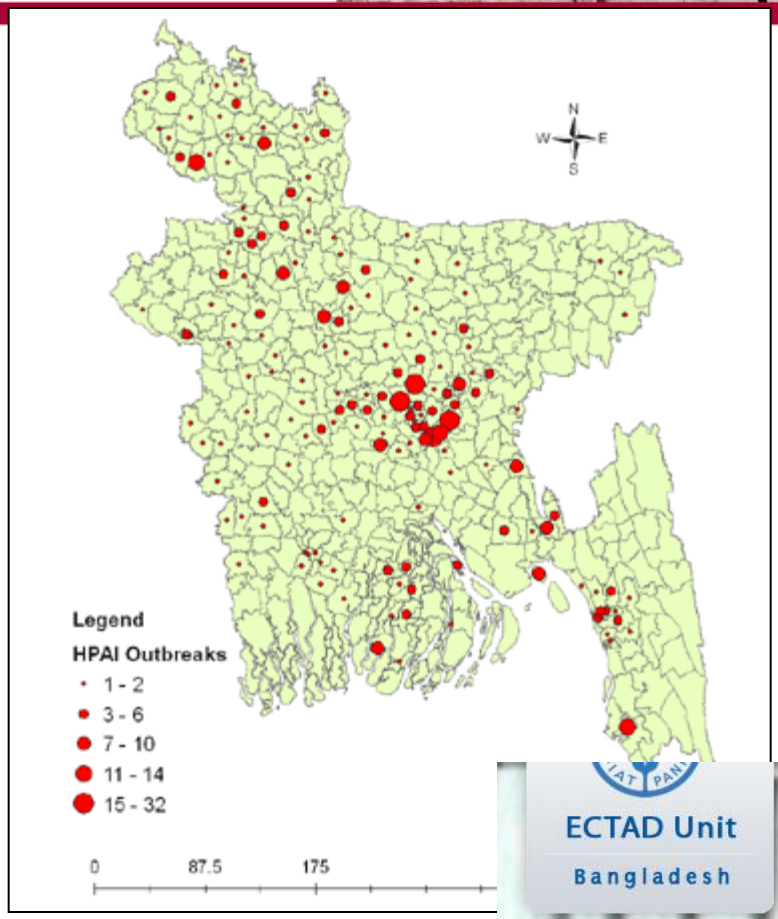
In the first SMS, the alphabet here indicates the kind of farm, with B for Backyard and C for Commercial. In the second SMS, it would be either N (No danger) or S (Suspicion of H5N1 HPAI)

Tells the mobile service provider to redirect the SMS to FAO's server

T indicates the Total number of birds in the poultry farm

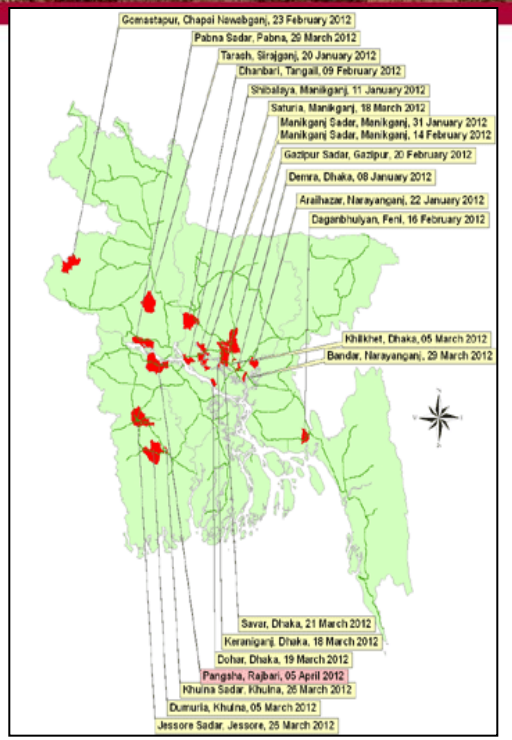
S indicates the number of birds still sick in the poultry farm at the time of the SMS

GF-TADs
GLOBAL FRAMEWORK FOR THE PROGRESSIVE CONTROL OF TRANSBOUNDARY ANIMAL DISEASES
OIE



260 out of 487 sub-districts.

- 780 Community Animal Health Workers (CAHW)
- 88 Veterinary Surgeons
- 260 Upazilla Livestock Officers



ECTAD Unit
Bangladesh

DPT Pilot Studies

- SADC countries
- Namibia, Zambia, Mozambique and Tanzania

- Livestock Committee SADC recommeneded 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) whit 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 ckeck (editing, validation and confirmation)
- Priority diseases for SADC/LIMS (FMD, RVF)

FAO's Global Disease Information System (EMPRES-i)

Public website
(English, French, Spanish)

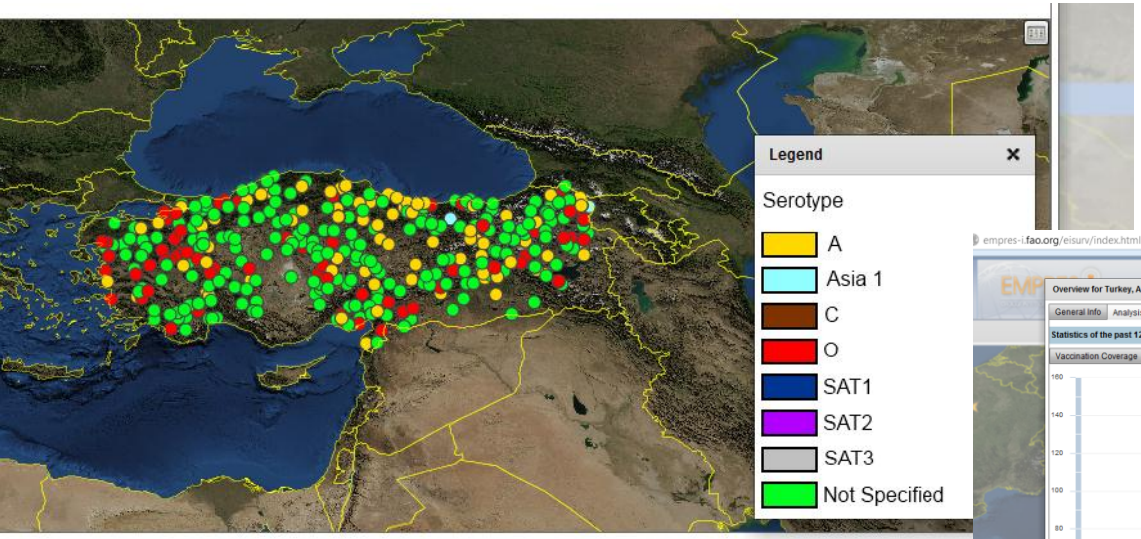
http://empres-i.fao.org

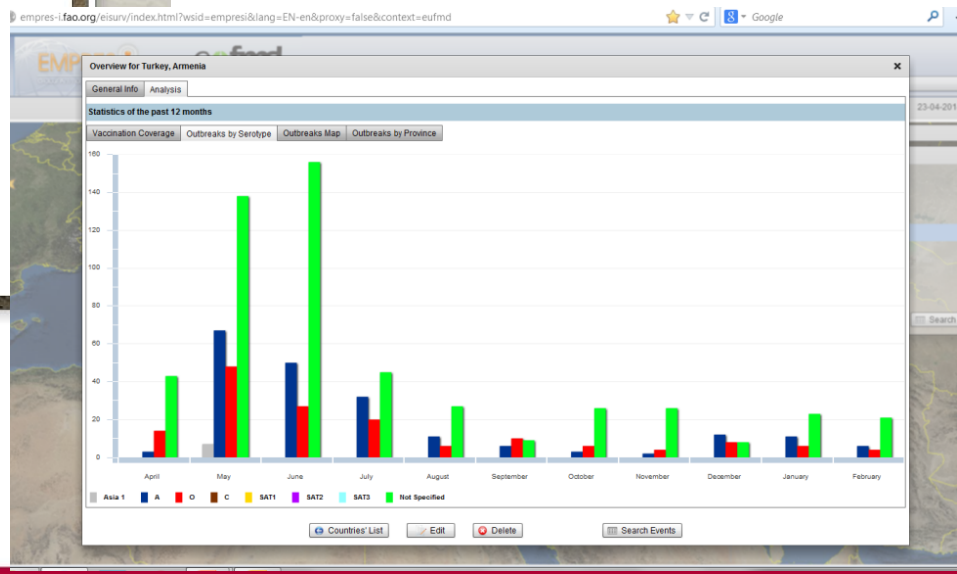
Internal website

http://empres-i.fao.org/empres-i3g/

FMD West Eurasia Database

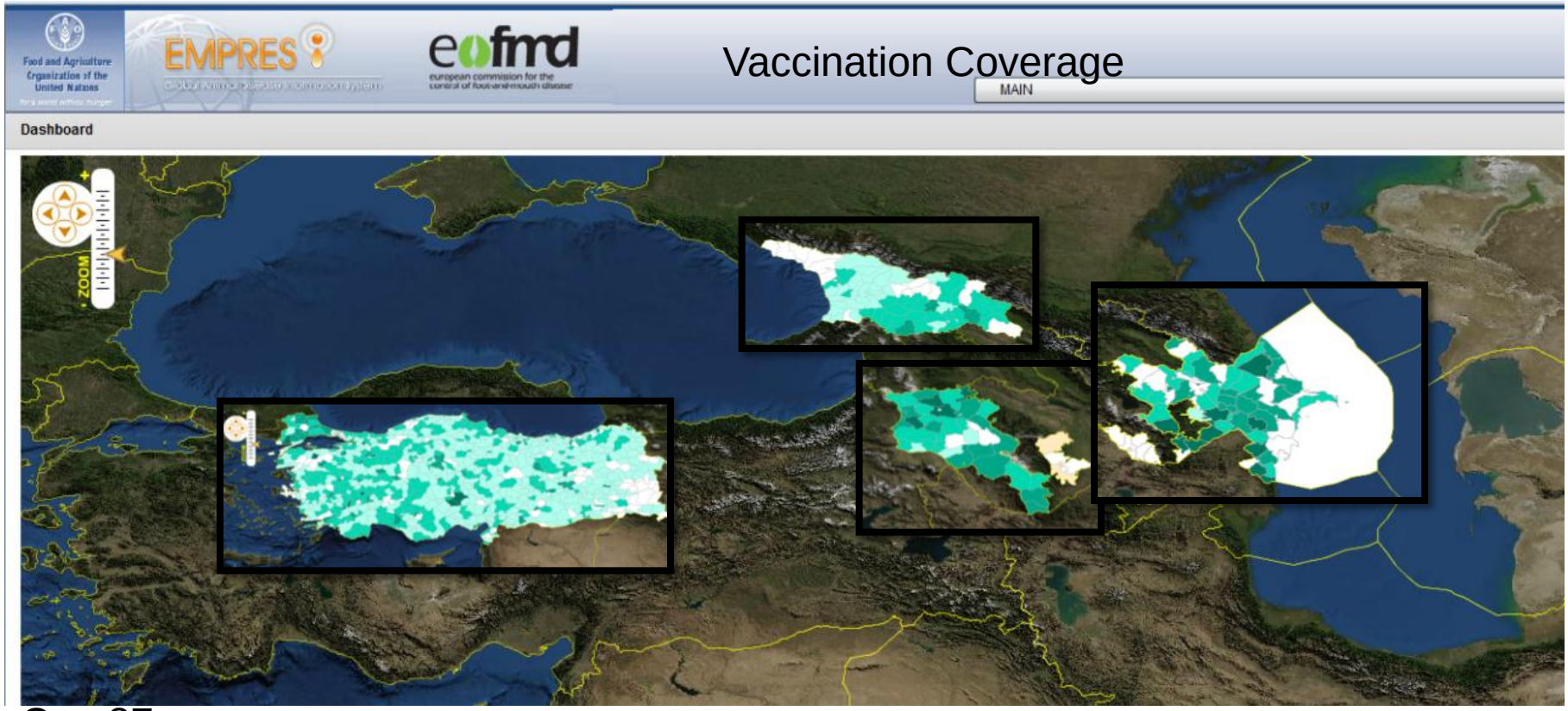
- Secure website, password protected
- Armenia, Azerbaijan, Georgia, Turkey: outbreak and vaccination data input monthly





West Eurasia Database

- 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
Global Animal Disease Information System

EMPRES-i - workflow

DATA ENTRY: DATA ARE ENTERED MANUALLY (COMPUTER AND/OR MOBILE PHONE)

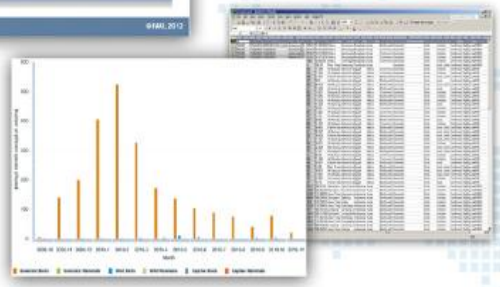
MOBILE PHONE APPLICATION
TO PROVIDE AND/OR ACCESS DISEASE OUTBREAK INFORMATION

MY EMPRES-I:
USER PREFERENCES SET UP FOR DIFFERENT SECTIONS INCLUDING DISEASE OUTBREAKS (BY SELECTING A DISEASE, A PERIOD AND A GEOGRAPHICAL AREA), CVOS, LABORATORIES AND NEWSLETTERS.

INTERACTIVE MAP:
ACCESS TO EPIDEMIOLOGICAL AND LABORATORY INFORMATION FROM AN OUTBREAK LOCATION

ADDITIONAL LAYERS:
LAYERS SUCH AS LIVESTOCK POPULATION AND PRODUCTION, BIOPHYSICAL, SOCIO-ECONOMIC, ANIMAL HEALTH STATUS OR TRADE (FAO - GLIPHA)

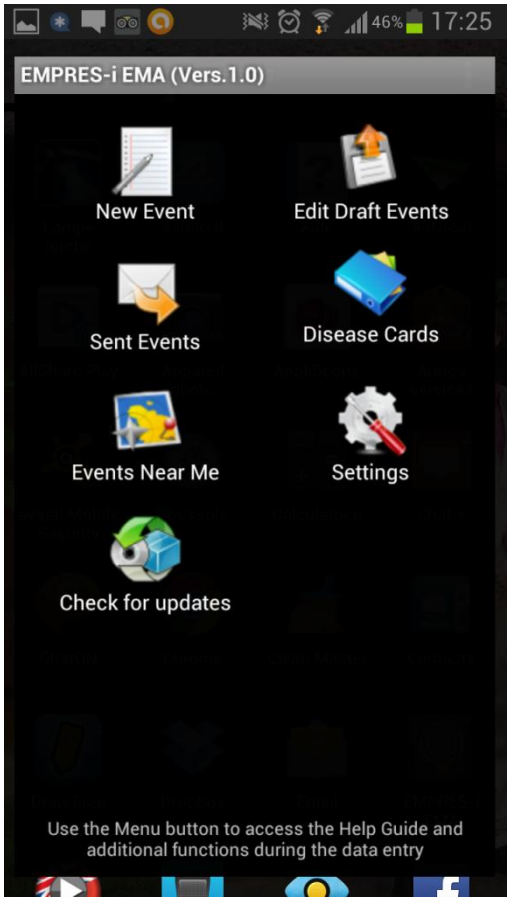
ANALYSIS TOOL:
DATA IS PRESENTED IN TABLES, CHARTS OR GRAPHS AND CAN EASILY BE DOWNLOADED IN CSV OR XLS FORMAT FOR FURTHER ANALYSIS

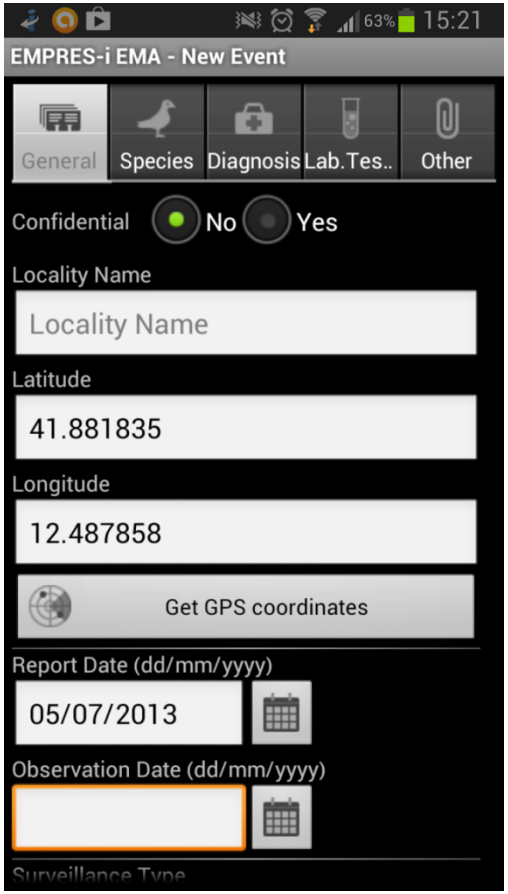


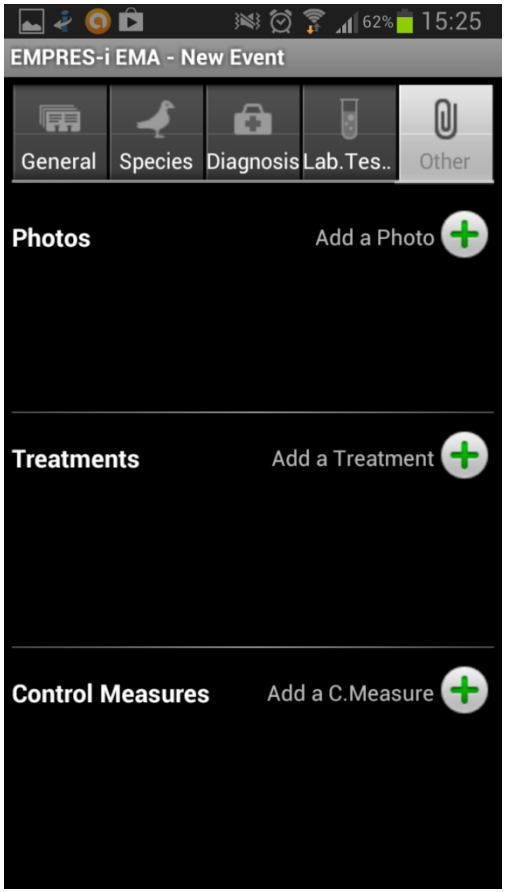
AUTOMATED DATA UPLOAD:
A SPECIAL EXCEL FILE APPLICATION FACILITATES THE UPLOAD OF LARGE AMOUNTS OF DATA INTO THE SYSTEM

http://empres-i.fao.org

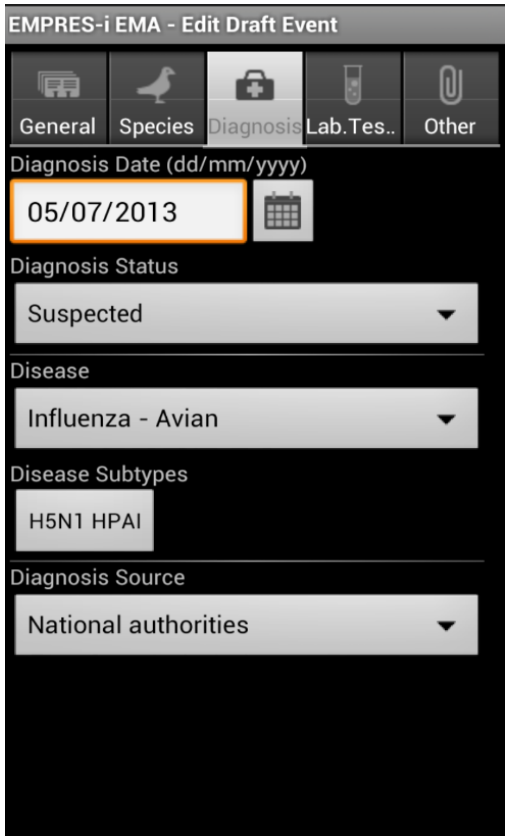
EMA-i for Android

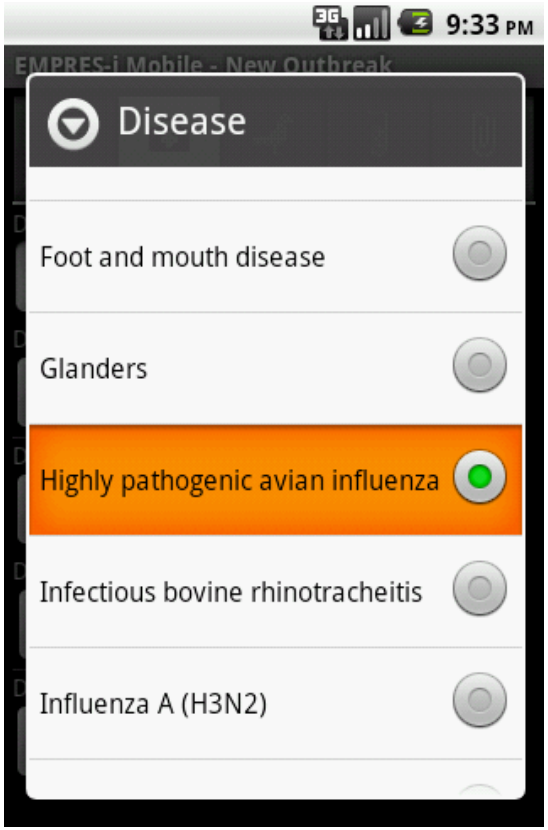


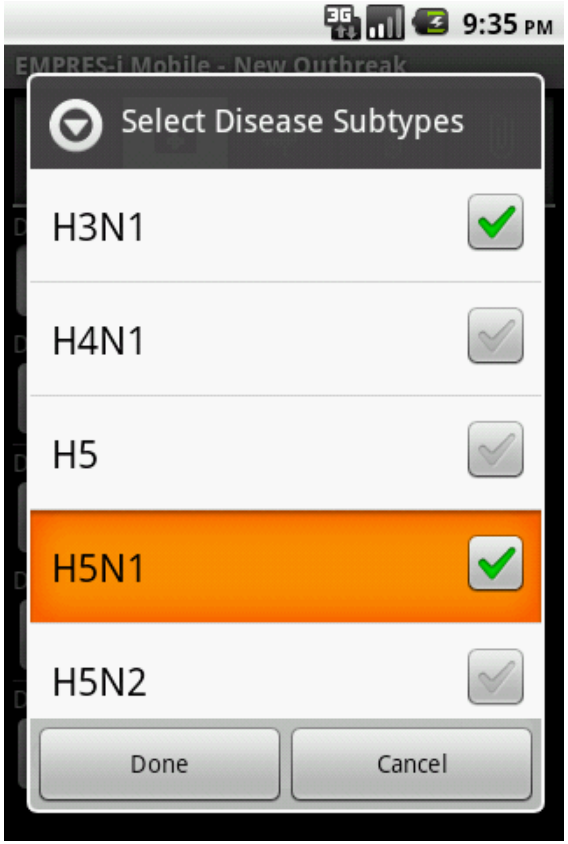




EMA-i for Android

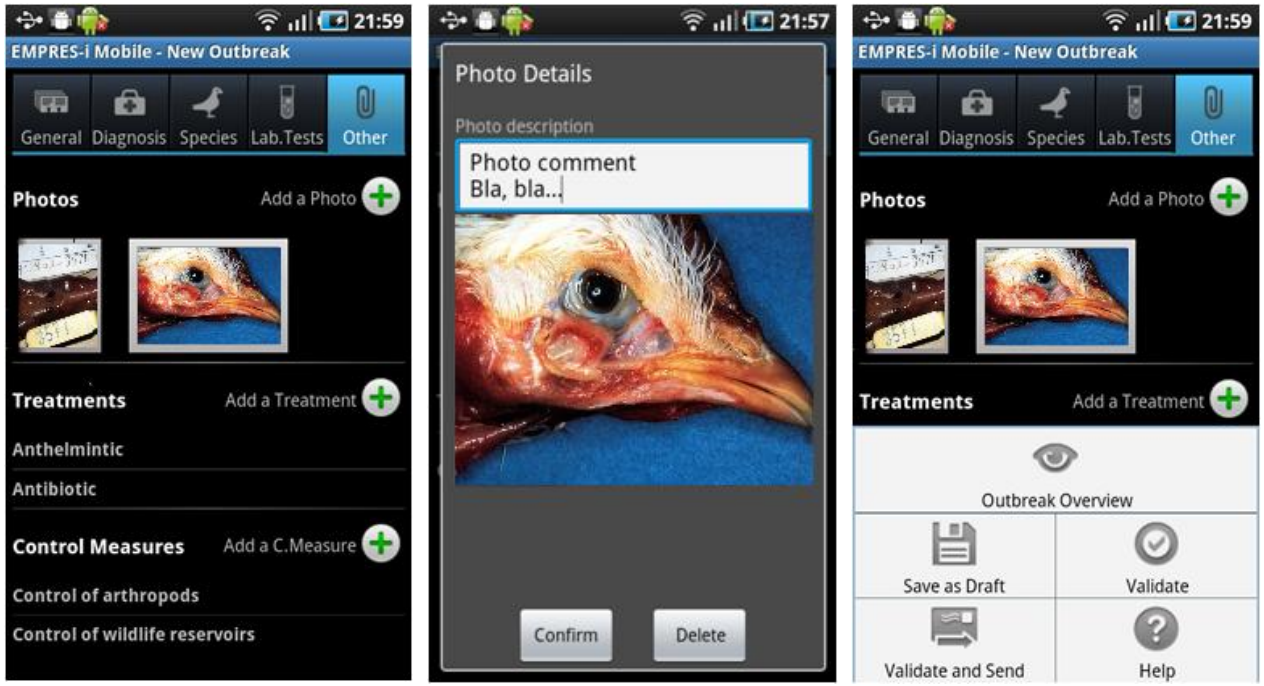






EMA-i for Android

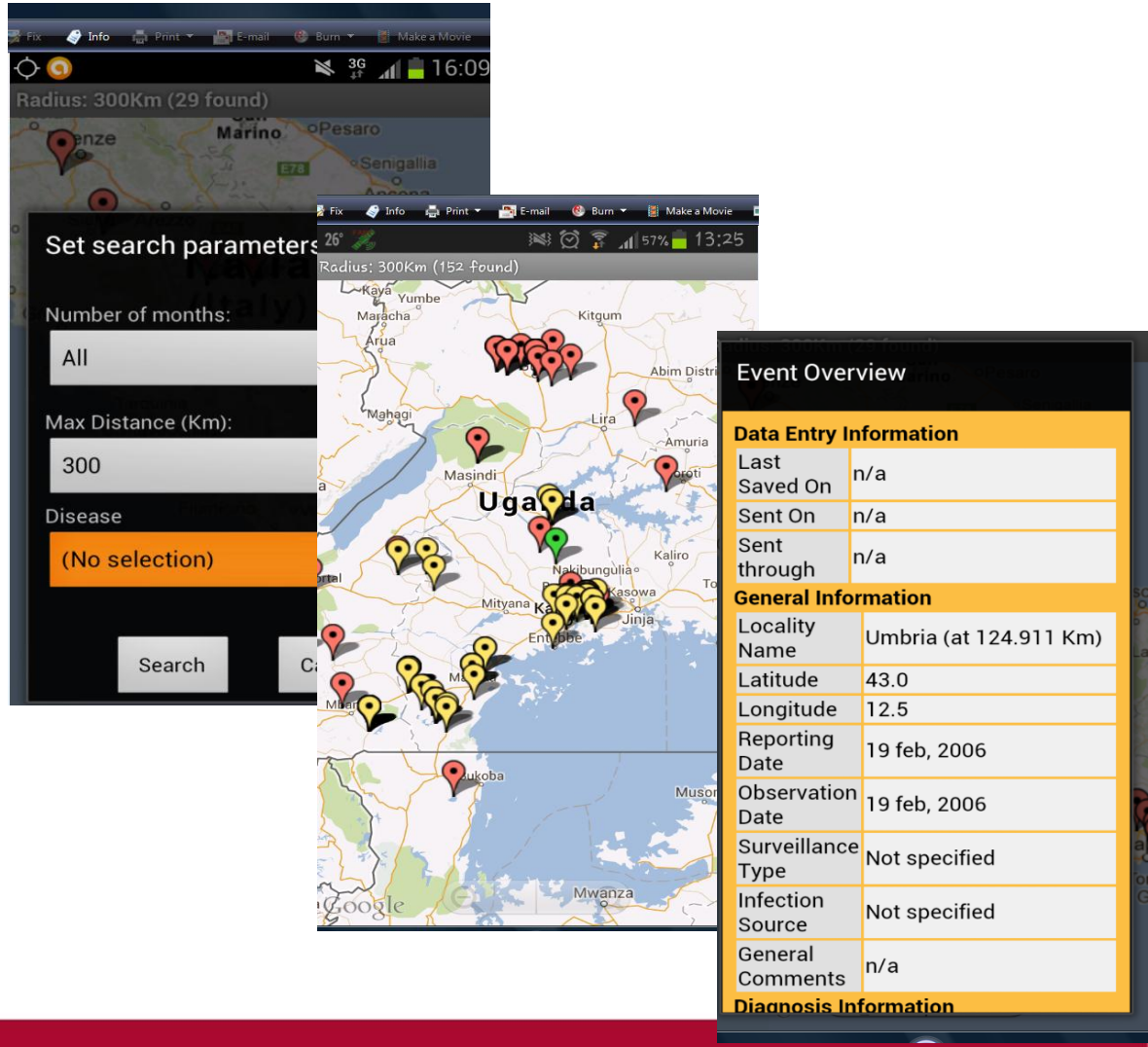
To attach one or more photos (clinical signs, lesions etc..), when collecting and sending information for an outbreak.



Additional information and Photos

EMA-i - Event Near Me function

- 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"

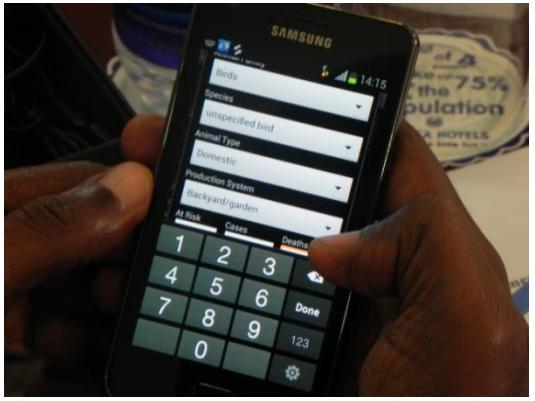


How to pilot EMPRES-i – EMA

- **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

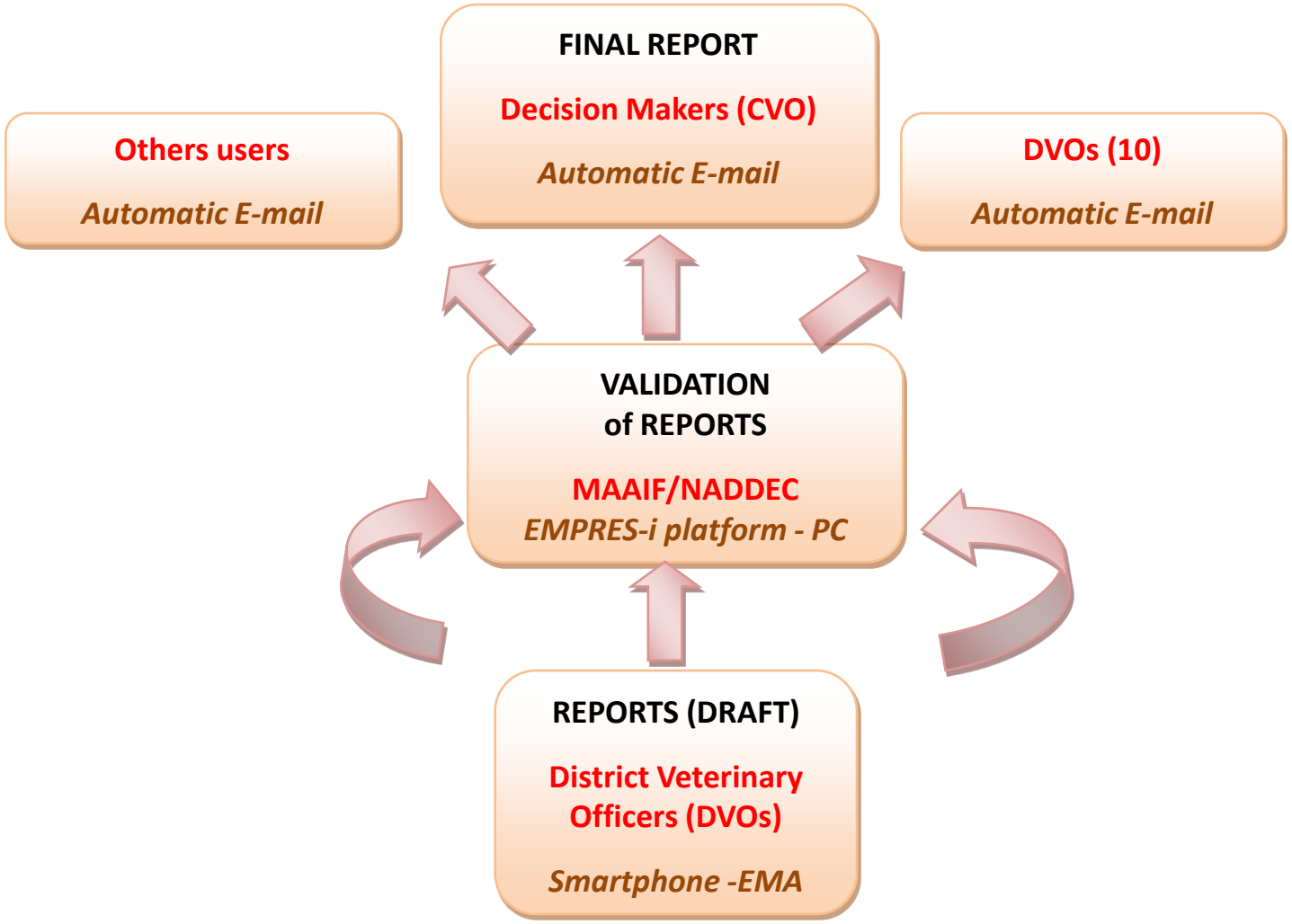
• **Time period:**

- 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
Others users
Automatic E-mail
DVOs (10)
Automatic E-mail
VALIDATION
of REPORTS
MAAIF/NADDEC
EMPRES-i platform - PC
REPORTS (DRAFT)
District Veterinary Officers (DVOs)
Smartphone -EMA

EMPRES-i EMA – E-mail notifications/Report

Nyamarwa village, Nyamarwa subcounty, Kibaale district(Mubende)/Coccidiosis//Suspected/Domestic/#CONFIDENTIAL#/validated/EMPRES-i - Message (Plain Text)

Message | Adobe PDF

Reply | Reply to All | Forward | Delete | Move to Folder | Create Rule | Other Actions | Block Sender | Safe Lists | Not Junk | Categorize | Follow Up | Mark as Unread | Find | Related | Select

From: EMPRES-i Notifier [no-reply@fao.org] Sent: Fri 01/11

To: Dr. Ademun, Rose Okurut; Dr. Amanya, Moses; Dr. Ayebazibwe, Chris; Dr. Baraza, Patrick; Dr. Eswagu, Sam; Dr. Kasozi, Bruhan; Dr. Kauta, Nicholas; Dr. Kimbugwe, Kiwanuka; Dr. Kiryabwire, David; Dr. Mayega, Lawrence; Dr. Okori, Dr. Rutebarika, Chris. S.; Dr. Ssekawojwa, Edward; Dr. Were, George .H.; Mr. Mayanja, Frank; Dr. Nantima, Noelina; Dr. Ndumu, Deo; Dr. Sserugga, Joseph

Cc:

Subject: Nyamarwa village, Nyamarwa subcounty, Kibaale district(Mubende)/Coccidiosis//Suspected/Domestic/#CONFIDENTIAL#/validated/EMPRES-i

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

Thank you,
NADDEC Team

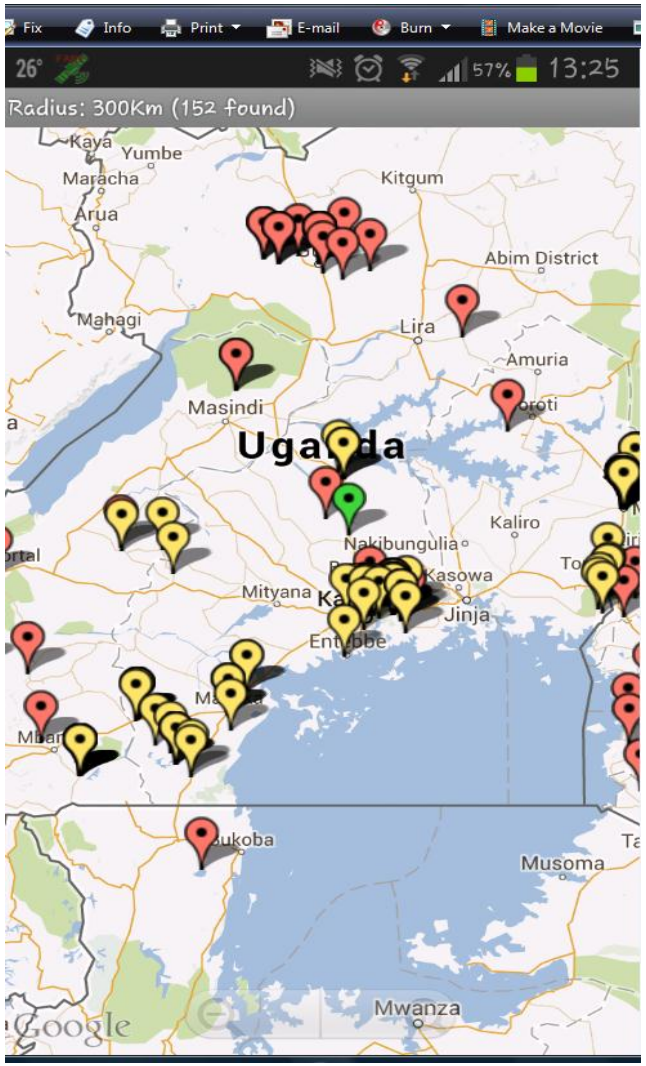
****
Action: VALIDATED

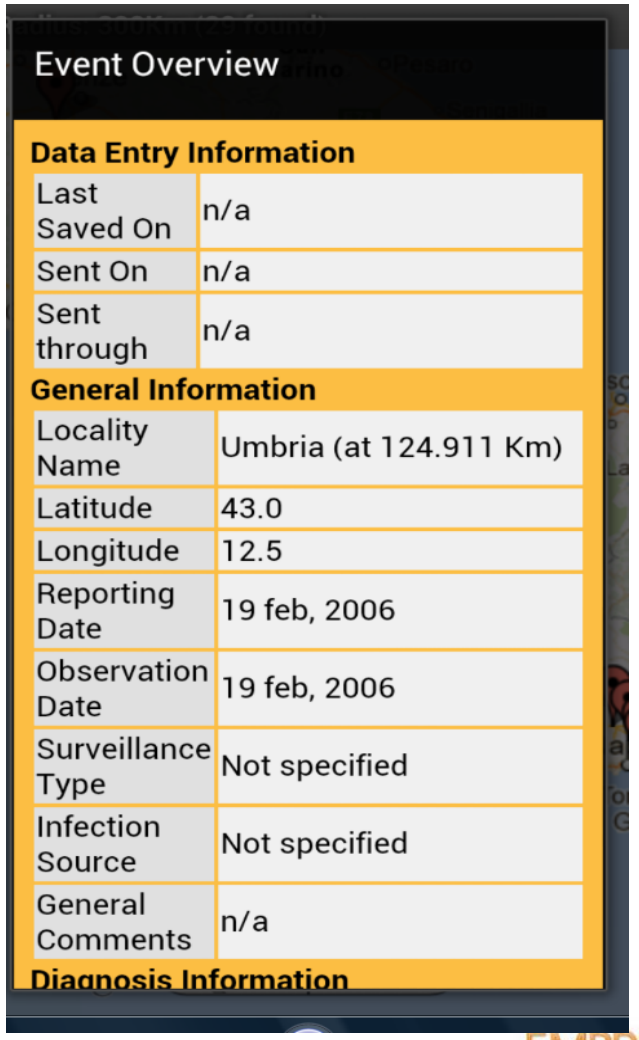
==========
Disease: Coccidiosis
Locality: Nyamarwa village, Nyamarwa subcounty, Kibaale district (Mubende)
Observation Date: 30-10-2013
==========
Diagnosis information
Status: Suspected
Disease: Coccidiosis
Serotype:
Source: National authorities
==========
Epidemiological information
Species affected: Domestic,chicken
Humans affected: No
==========
Geographical location
Locality: Nyamarwa village, Nyamarwa subcounty, Kibaale district
Latitude: 0.615347
Longitude: 31.390003
Admin2: Buwekula
Admin1: Mubende
Country: Uganda
Region: Africa
==========
Outbreak ID: 181660
Confidential: Yes
Workspace: EMPRES-i
URL: http://empres-i.fao.org/empresi3g/
==========
Inserted: Wed 30-10-2013 17:06:31
Inserted by: Amanya, Moses
Last modified: Fri 01-11-2013 11:53:48
Last modified by: Sserugga, Joseph
Validated by: Sserugga, Joseph
Validation date: Fri 01-11-2013 0:00:00

➢ **E-mail with disease event report generated from EMPRES-i**

EMPRES
Global Animal Disease Information System

EMPRES-i EMA – Mapping/Near me

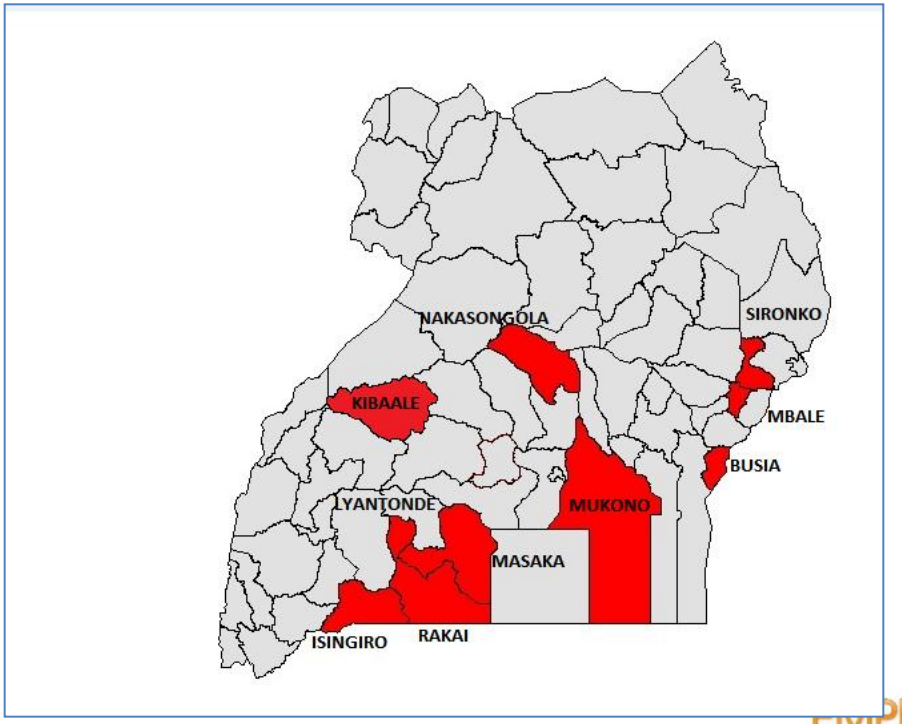




EMA-i: a pilot activity in Uganda

EMPRES-i EMA pilot in 10/112 districts:

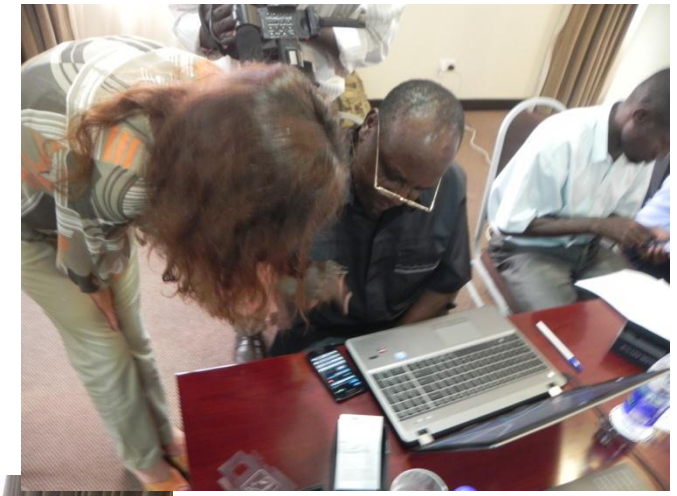
Nakasongola, Mbale, Rakai, Sironko, Busia, Lyantonde, Isingiro, Masaka, Mukono, Mityana, Kibaale.



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 ...

EMPRES

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