



Mobile Technologies: New tools to improve diseases surveillance and reporting

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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 disinfection (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

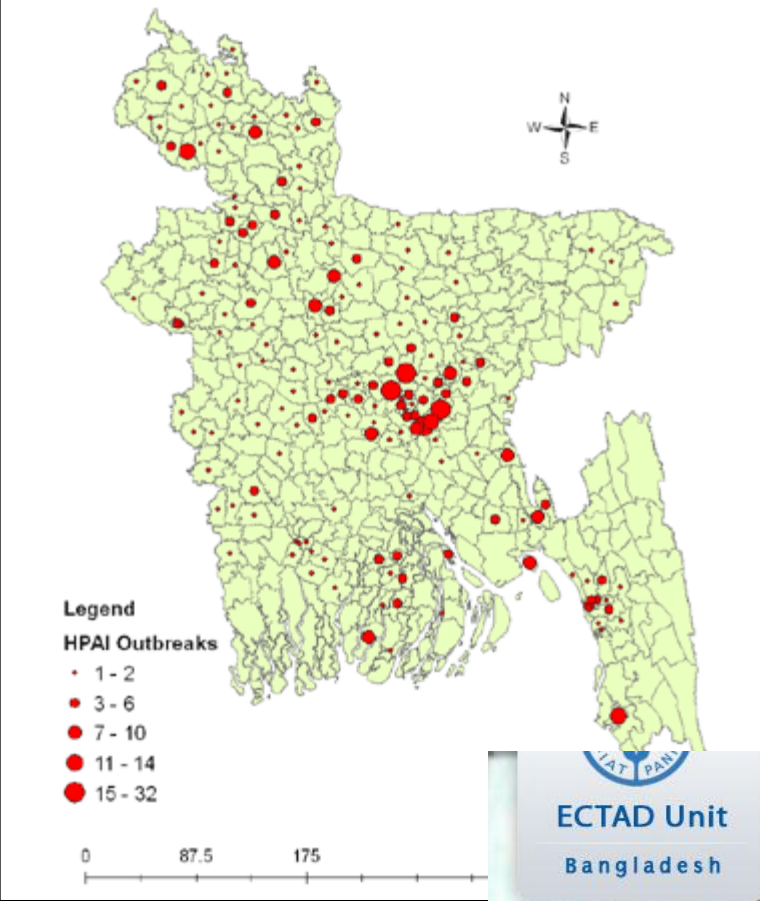
In the first SMS, the alphabet here indicates the kind of farm, with B for Backyard and C for Commercial. In the second SMS, it would be either N (No danger) or S (Suspicion of H5N1 HPAI)

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

T indicates the Total number of birds in the poultry farm

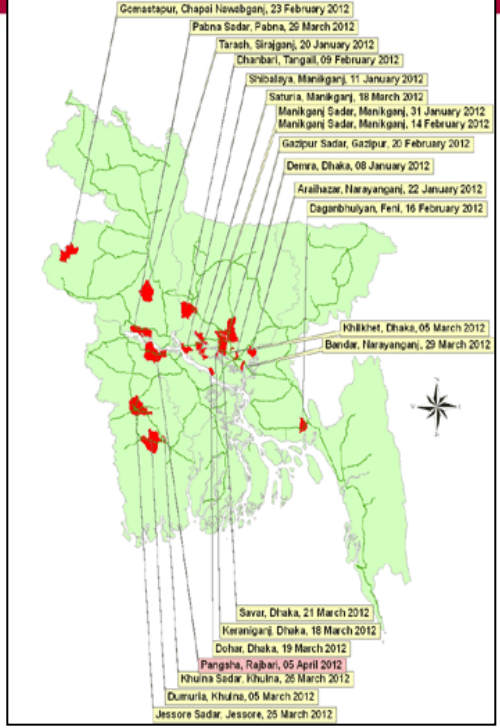
S indicates the number of birds still sick in the poultry farm at the time of the SMS





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 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) 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)

EMPRES-i
Global Animal Disease Information System

EMPRES-i provides up to date information on the global animal disease distribution and current threats at national, regional and global level. Disease Events can be presented on a map and further analyzed by choosing from a variety of filters.

LATEST EVENTS

- Cimean Congo haemorrhagic fever 14/05/2012 - Pakistan
- Cimean Congo haemorrhagic fever 14/05/2012 - Pakistan
- Cimean Congo haemorrhagic fever 14/05/2012 - Pakistan
- Cimean Congo haemorrhagic fever 14/05/2012 - Pakistan

DIRECTORY EMPRES-i provides contact details of the Chief Veterinary Officers (CVOs) for each country.

LABORATORIES EMPRES-i provides contact information of FAO/OIE reference laboratories and Regional laboratory.

LIBRARY EMPRES-i provides access to FAO technical publications such as bulletins, journals, reports.

<http://empres-i.fao.org>

Internal website

FAOLogin
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Helping to build a world without hunger

Security message
 This is a Public or Shared computer
You must select this option if other people have access to this computer.
 This is a Private computer
Select this option if you are the only person who uses this computer. Once authenticated by FAO Login, you will not need to enter your password again to access FAO Single Sign-On applications.

FAODOMAIN: [] Show all domains

Password: []
Login Forgot your password?

Common Authentication Framework (CAF)

Dashboard

RSS external feeds

- UCD/AVE 2012-01-10 08:05 - PFD News - Paraguay: PFD in Paraguay: 568 livestock sacrificed and major investigation into previous outbreak.
- UCD/AVE 2012-01-09 08:03 - PFD News - China: Chinese per capita meat consumption has doubled in the last few decades.
- AD/Agre 2012-01-09 08:00 - AD/Agre - AD/Agre: Bird Flu Suspect Dies in Jakarta After 6 Days of Illness.
- AD/Agre 2012-01-09 04:14 - AD/Agre - AD/Agre: Brother of Indonesian Bird Flu Victim Cleared by Doctors After 10 Days of Illness.
- UCD/AVE 2012-01-09 20:51 - PFD News - General Information: New PFD Publications.
- UCD/AVE 2012-01-09 20:02 - PFD News - Brazil: Brazil - The pork trade.
- UCD/AVE 2012-01-09 20:19 - PFD News - Kazakhstan: Foot and mouth disease: Kazakhstan. (Follow-up report No. 4)
- UCD/AVE 2012-01-09 20:16 - PFD News - Zimbabwe: Foot and mouth disease: Zimbabwe. (Follow-up report No. 3)

Disease situation

By month: [] By region: []

Total number of events since 10/07/2011

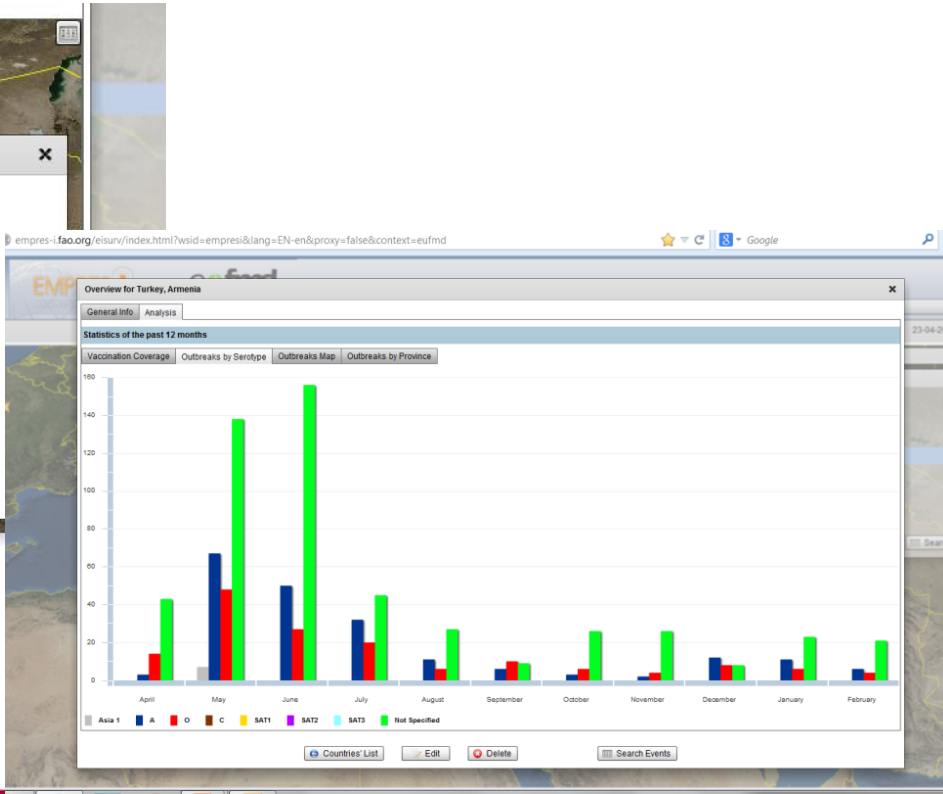
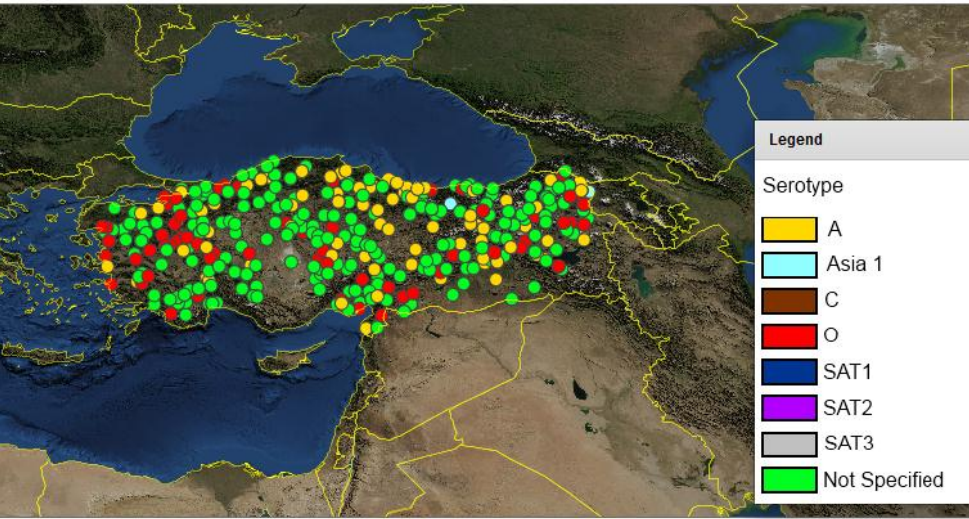
Month	Confirmed	Denied	Tentative
January	~100	~100	~100
December	~100	~100	~100
November	~100	~100	~100
October	~100	~100	~100
September	~100	~100	~100
August	~100	~100	~100

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



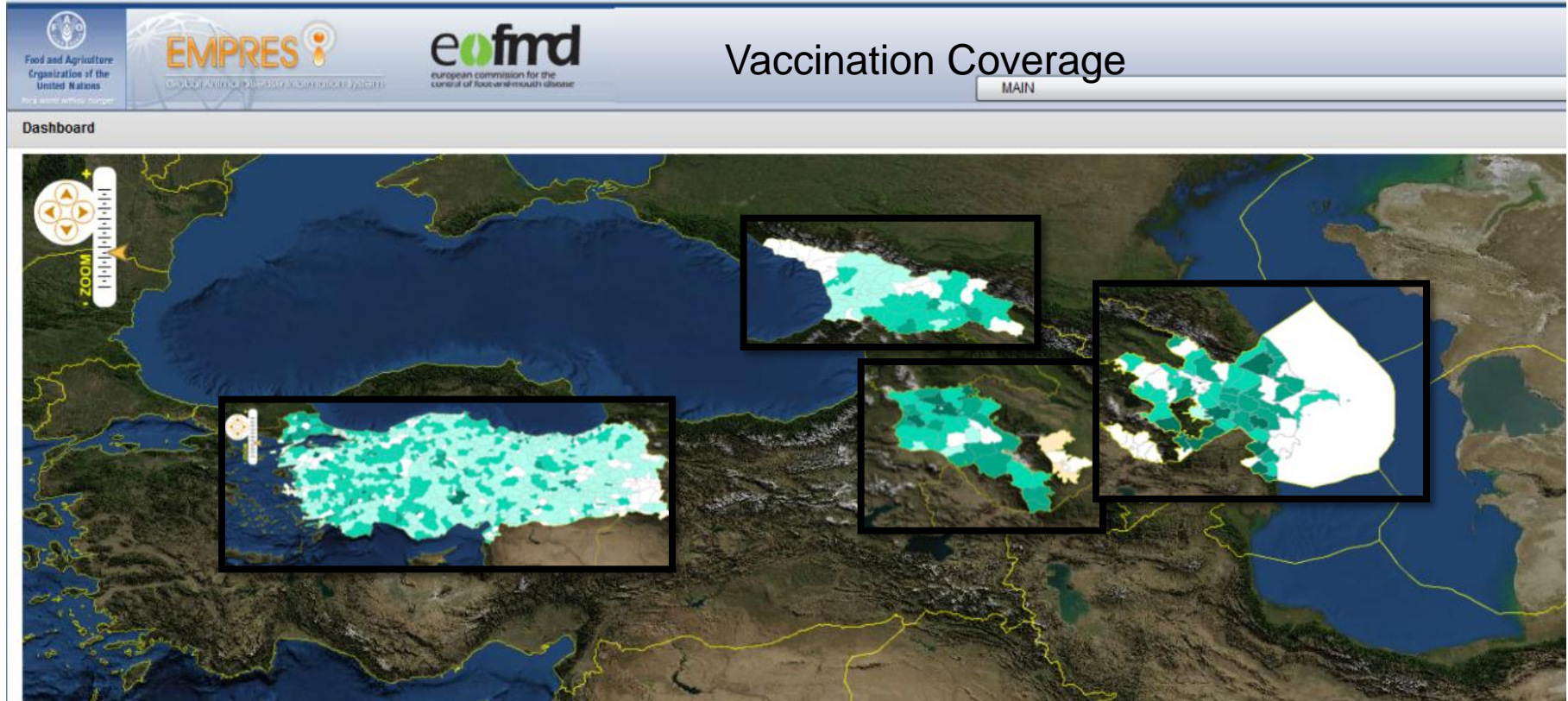
FMD West Eurasia Database

- 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

MY EMPRES-I:

USER PREFERENCES SET UP FOR DIFFERENT SECTIONS
INCLUDING DISEASE OUTBREAKS (BY SELECTING A
DISEASE, A PERIOD AND A GEOGRAPHICAL AREA), CVDS,
LABORATORIES AND NEWSLETTERS.

INTERACTIVE MAP:

ACCESS TO EPIDEMIOLOGICAL AND LABORATORY
INFORMATION FROM AN OUTBREAK LOCATION

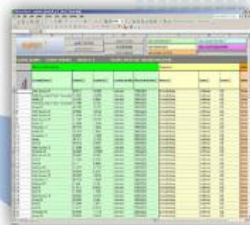


ADDITIONAL LAYERS:
LAYERS SUCH AS LIVESTOCK POPULATION
AND PRODUCTION, BIOPHYSICAL,
SOCIO-ECONOMIC, ANIMAL HEALTH STATUS
OR TRADE (FAO - GLIPHA)

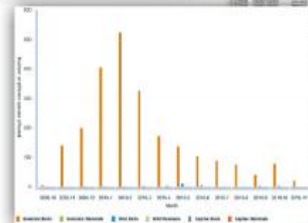
ANALYSIS TOOL:
DATA IS PRESENTED IN TABLES, CHARTS OR
GRAPHS AND CAN EASILY BE DOWNLOADED IN CSV
OR XLS FORMAT FOR FURTHER ANALYSIS



VALIDATION:
DATA ARE VERIFIED AND
VALIDATED BEFORE BEING
OFFICIALLY PUBLISHED
BY FAO



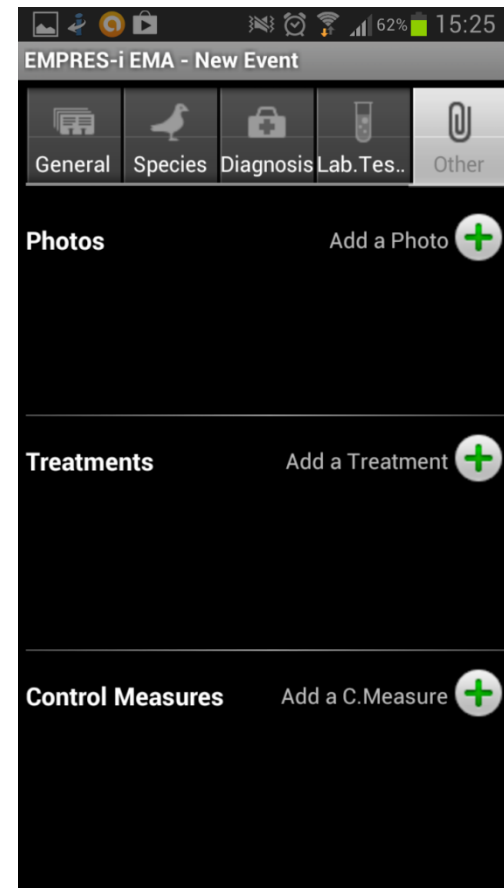
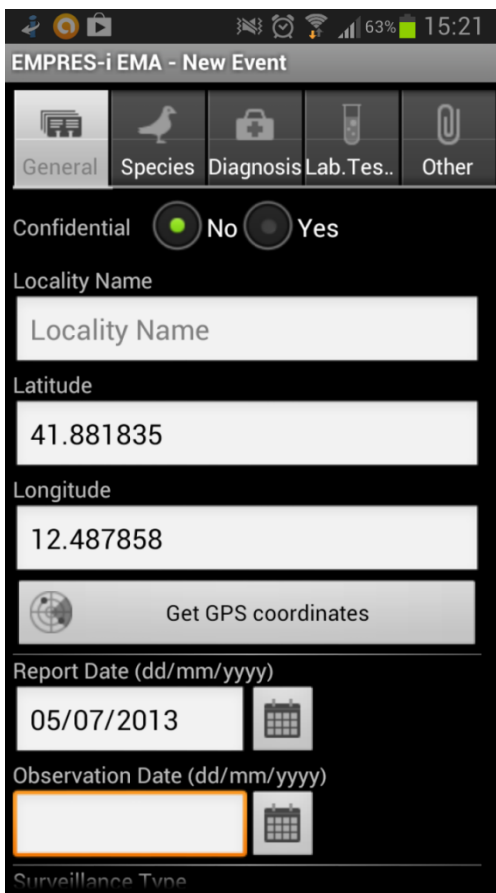
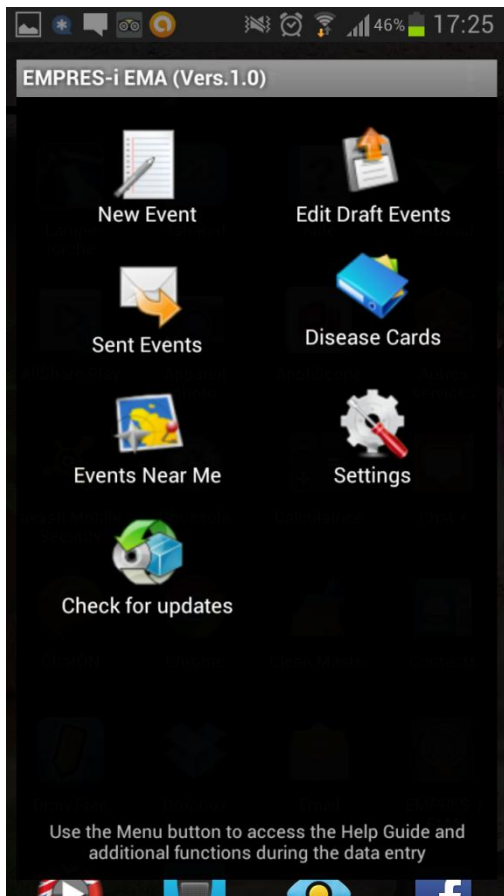
AUTOMATED DATA UPLOAD:
A SPECIAL EXCEL FILE APPLICATION FACILITATES
THE UPLOAD OF LARGE AMOUNTS OF DATA INTO
THE SYSTEM



<http://empres-i.fao.org>



EMA-i for Android





EMA-i for Android

EMPRES-i EMA - Edit Draft Event

General Species **Diagnosis** Lab. Tes.. Other

Diagnosis Date (dd/mm/yyyy)
05/07/2013

Diagnosis Status
Suspected

Disease
Influenza - Avian

Disease Subtypes
H5N1 HPAI

Diagnosis Source
National authorities

EMPRES-i Mobile - New Outbreak

Disease

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

EMPRES-i Mobile - New Outbreak

Select Disease Subtypes

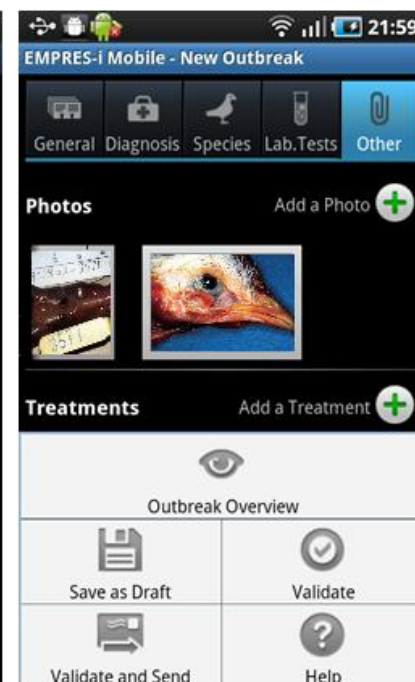
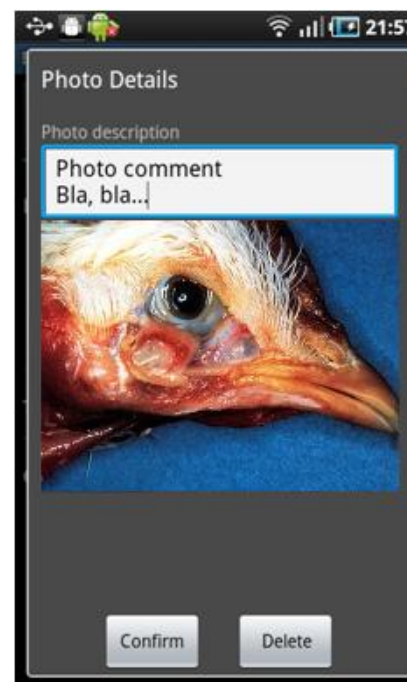
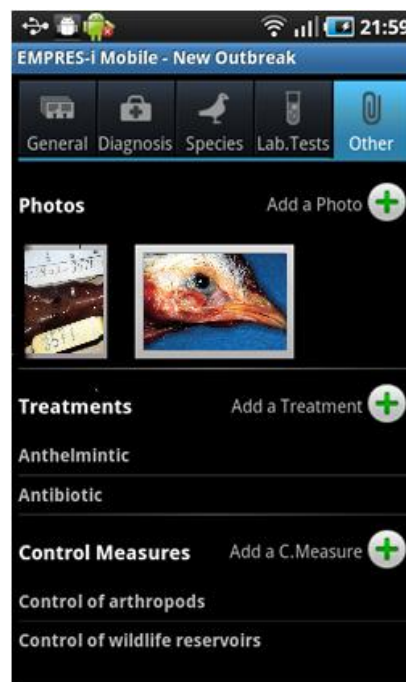
- H3N1
- H4N1
- H5
- H5N1**
- H5N2

Done Cancel



EMA-i for Android

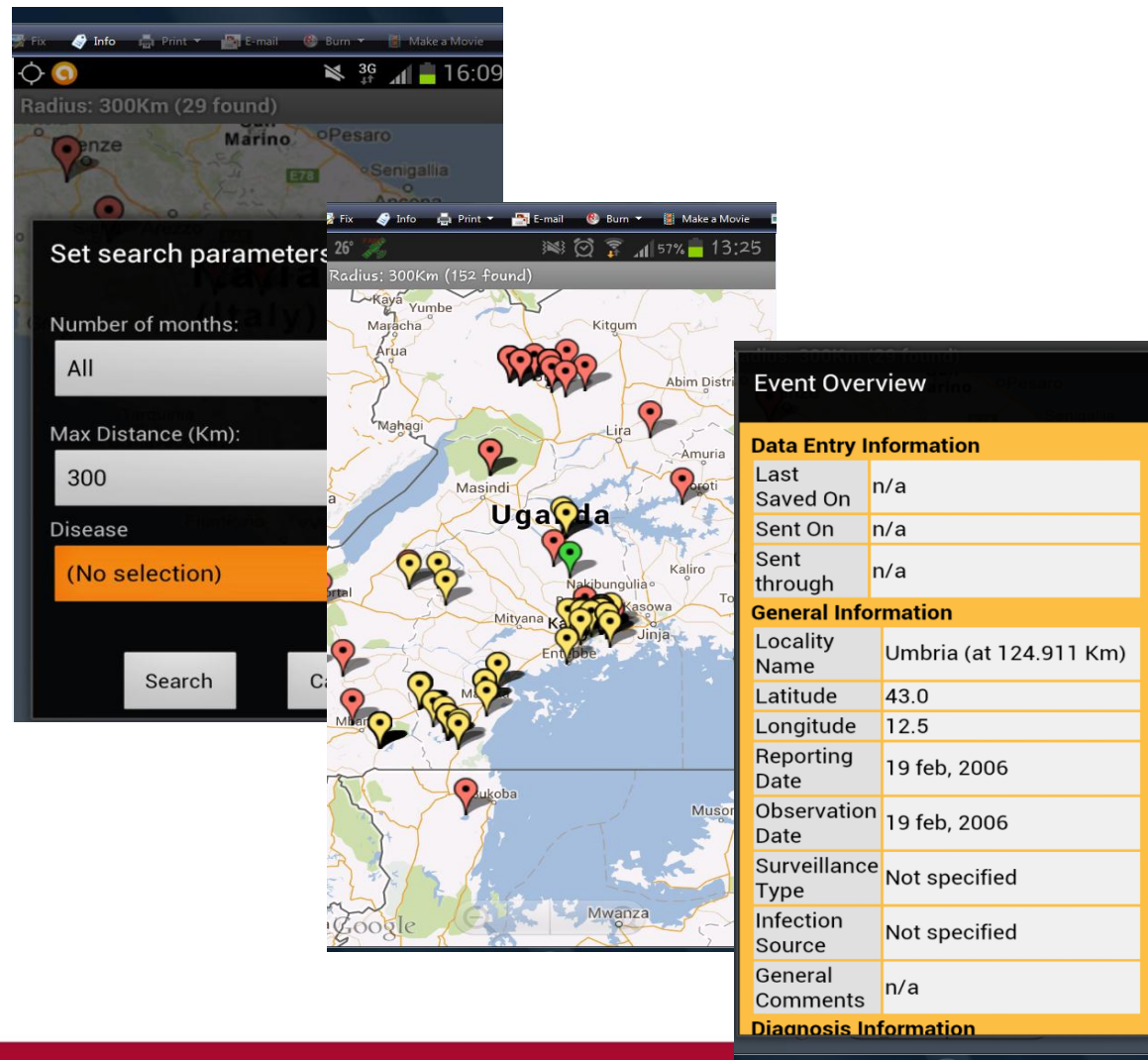
To attach one or more photos (clinical signs, lesions etc..), when collecting and sending information for an outbreak.



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”



The screenshot displays the EMA-i application interface. On the left, a 'Set search parameters' dialog box is shown with the following settings:

- Number of months: All
- Max Distance (Km): 300
- Disease: (No selection)

The central map shows Uganda with several red and yellow markers indicating outbreak locations. The search radius is set to 300Km, with 152 events found.

On the right, an 'Event Overview' table provides details for a specific event:

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	



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:**

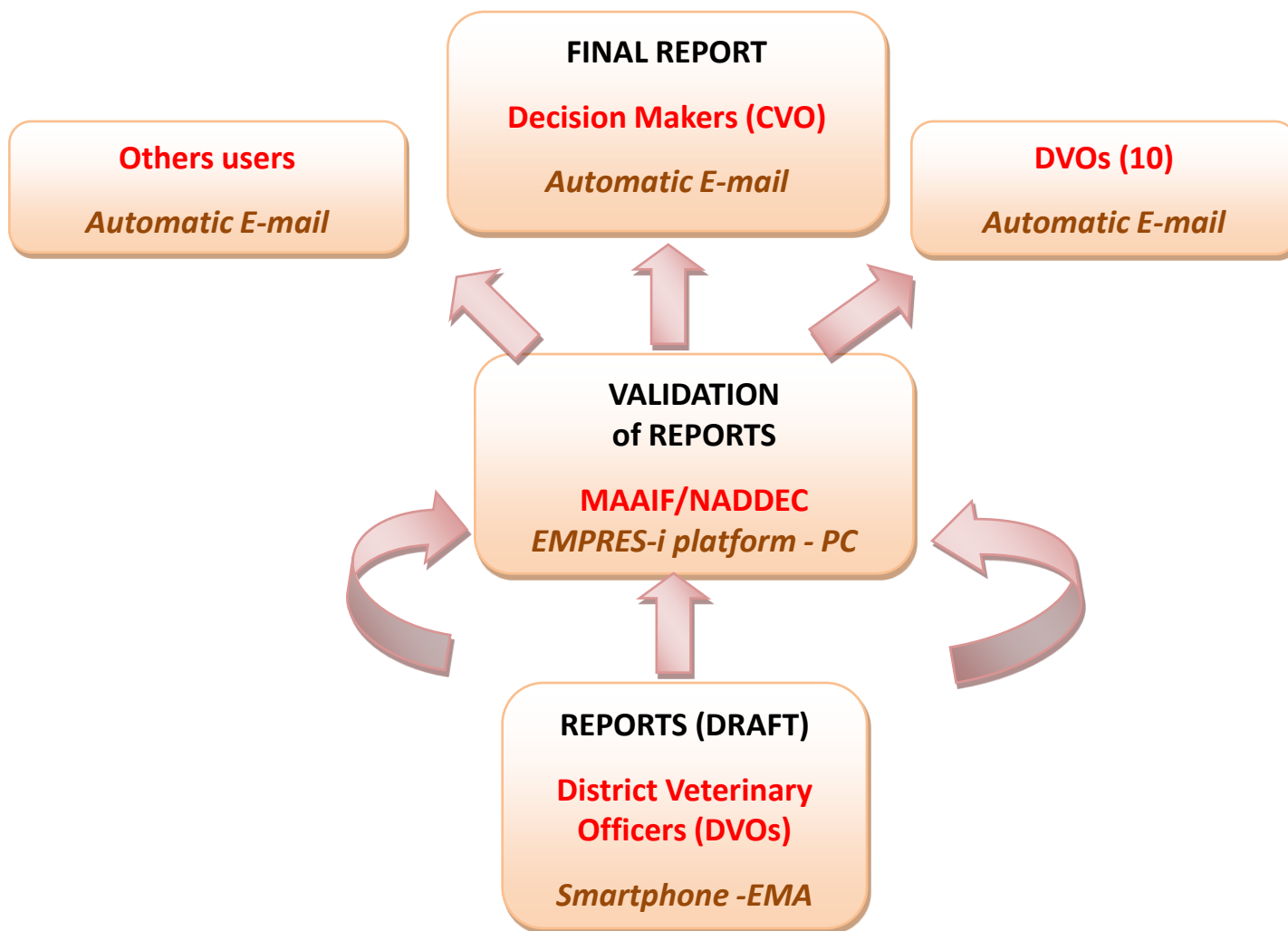
- January 2013 - July 2013: Preparation of the pilot (Districts, Guidelines, SOPs, Procurement, Training material...)
- July 2013 –December 2013: Implementation of the pilot in Uganda (Delivery of equipment, Training)

- **Key players:**

- National Animal Disease Diagnostics and Epidemiology Center (NADDEC) (5) .
- District Veterinary Officers (10)
- Chief Veterinary Officers



Workflow



EMPRES-i FMA – E-mail notifications/Report

Message Adobe PDF

From: EMPRES-i Notifier [no-reply@fao.org]
 To: Dr. Ademun, Rose Okurut; Dr. Amany, Moses; Dr. Ayebazibwe, Chris; Dr. Baraza, Patrick; Dr. Eswagu, Sam; Dr. Kasozi, Bruhan; Dr. Kauta, Nicholas; Dr. Kimbugwe, Kwanuka; 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. Nkumu, Deo; Dr. Sserugga, Joseph
 Subject: Nyamarwa village, Nyamarwa subcounty, Kibaale district(Mubende)/Coccidiosis//Suspected/Domestic/#CONFIDENTIAL#/validated/EMPRES-i - Message (Plain Text)

Sent: Fri 01/11

Dear NADDEC "Acceptance" Team,
 A disease report was submitted b platform and you can proceed in
 Click from your computer at the <http://empres-i.fao.org/empresi3g/>
 Domain: Empres-i
 And type your username and pasw Then go into Disease Event/EMA M

The EMPRES-i Team.

General Information:

 Originator: George .H. Were ([geo](mailto:geo@empres-i.fao.org))
 Observation date: 2013/07/14
 Reporting date: 2013/07/12
 Locality name: MBALE (Mbale)
 (Lat/Long: 1.06953/34.181751)

Outbreak Details:

 Disease: Newcastle disease (Susp)

Species:

 chicken
 Cases: 100
 Deaths: 200
 At Risk: 500
 Destroyed: 20
 Slaughtered: 0
 Vaccinated: 500

Humans: No

Clinical Signs:

 Torticollis (scw neck) - chicke

Lesions:

Dear NADDEC "Man
 A disease report available in EMP
 Thank you,
 NADDEC Team

 Action: VALIDATED

 Disease: Coccidiosis
 Locality: Nyamarwa village, Nyamarwa subcounty, Kibaale district (Mubende)
 Observation Date: 30-10-2013

 Diagnosis information
 Disease: Suspected
 Status: Coccidiosis
 Observation Date:
 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: Amany, 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-i EMA – Mapping/Near me



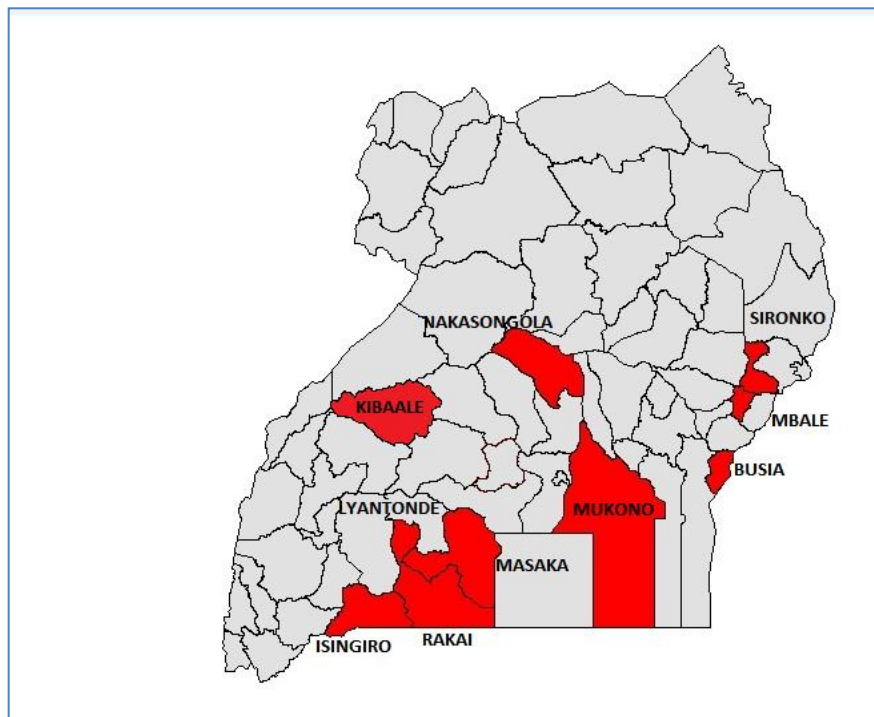
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Observation Date	19 feb, 2006
Surveillance Type	Not specified
Infection Source	Not specified
General Comments	n/a
Dianosis Information	



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.





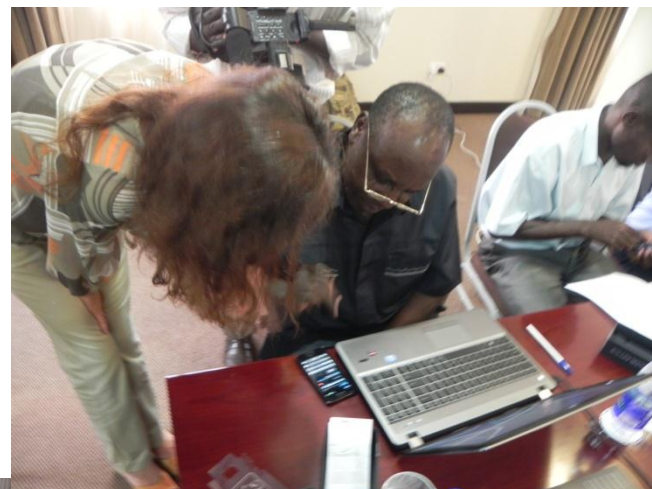
Training

➤ 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