

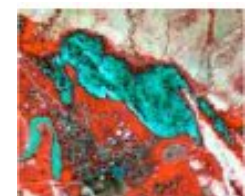
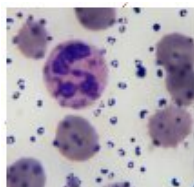
SAFE

SATellites For Epidemiology

SAFE solutions as a support for the surveillance
of Tuberculosis in Georgia

ARTES Applications Workshop

Audrey Berthier, MEDES, Project Manager
audrey.berthier@medes.fr

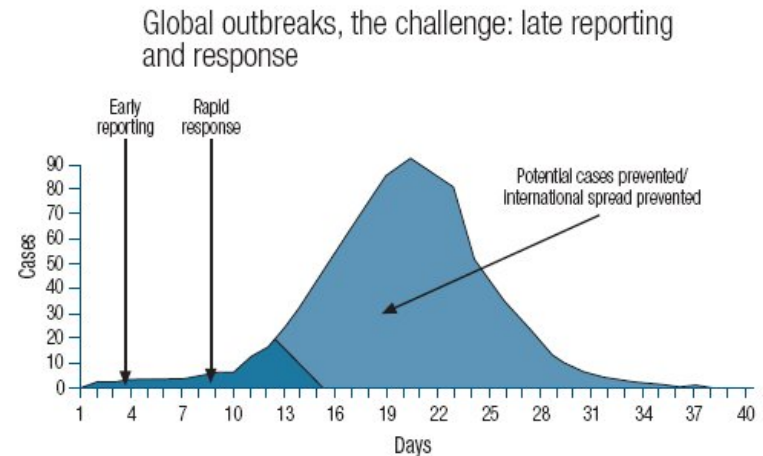


❖ Global public health context

- Global high risk of epidemics / Increasing risk with globalisation, climate change, population growth, high mobility and economic interconnectivity

❖ IHR 2005 requirements

- Global rules to enhance national, regional and global public health security
- To strengthen national disease surveillance, prevention, control and response systems for rapid detection and response to the risk of international disease spread.



Early detection can prevent the onset of epidemics or limit the epidemics

SAFE context

- ❖ **Context of epidemiological surveillance and response:**
 - Many configurations of deployment
 - Many stakeholders
 - Data collection from local to regional and national level
 - ✦ In many countries notification by paper forms sent by surface mail
 - ✦ Information transmission slowness -> slowness to mobilise resources for a quick response.

- ❖ **Satellite services for health early warning**
 - **Satellite communications**
 - ✦ Extend surveillance networks / Connect remote areas with remote experts ...
 - **Satellite navigation**
 - ✦ Geolocalisation
 - **Earth Observation products**
 - ✦ Risk mapping, resource mapping ...

- ❖ **For all these services, a good quality in situ data collection in near real time is required.**

Health Early Warning - Context

- ❖ Various complex scenarios and needs (data mining and data collection, modelling,...)

Three main « space relevant » scenarios

Disasters/outbreaks
response

Data collection needs
«On demand»

Satellite services
Satcoms
Possibly localisation
and earth
observation

Routine surveillance

Data collection needs
«Case based»

Satellite services
Possibly satcoms,
localisation and earth
observation

Risk mapping

Data collection needs
« In Situ »

Satellite services
Earth observation
Possibly satcoms
and localisation

An advanced flexible information system

**A basis to raise the needs for space-based services for
epidemiological surveillance**

SAFE - Project objectives

To develop and to assess the added value of various services based on **satellite communications** for all the phases of a health crisis including prevention, early warning and crisis management.

- ❖ **Funded by ESA (preparatory phase of IAP), collaboration with WHO**
- ❖ **Promotion of satellite services - focus on satcoms. No inclusion of Earth Observation tools.**
- ❖ **Dedicated applications - information system for epidemiological surveillance and outbreak management:**
 - Interoperable, flexible
 - Implementing existing standards
 - Based on well recognized open source technologies.



'SAFE' components - An end-to-end solution



❖ **Satellite communications**

- To restore the communication between the local sites and the decision-makers or the experts
- To restore the pre-existing information systems in a post crisis situation
 - ⇒ Provision of high bandwidth via satellite communications
 - ⇒ Mobile satcoms for mobile field teams

❖ **Innovative information system for flexible on-demand data collection: Epi defender**

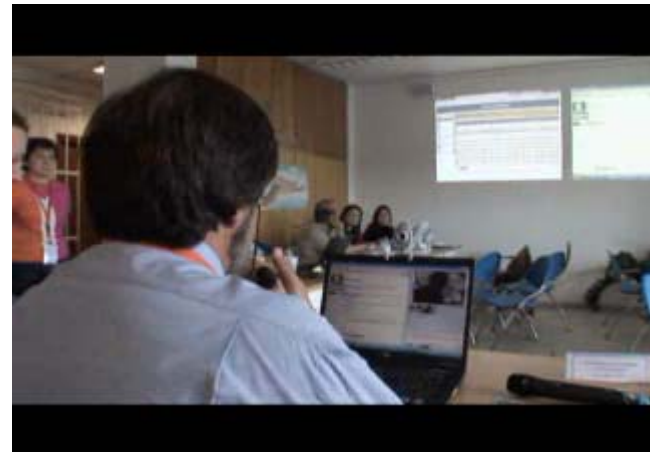
- Design and deployment of data collection applications
- Reporting functionalities
- GIS functions

❖ **Integrated tools for telemedicine or for tele-training**

❖ **Communicating vehicles / Lab Van**

- A local coordination van
- A mobile field laboratory with communication capabilities

Post-disaster demonstration



➔ Capacity to deploy on-demand information systems for epidemiological surveillance

❖ Tuberculosis in Georgia

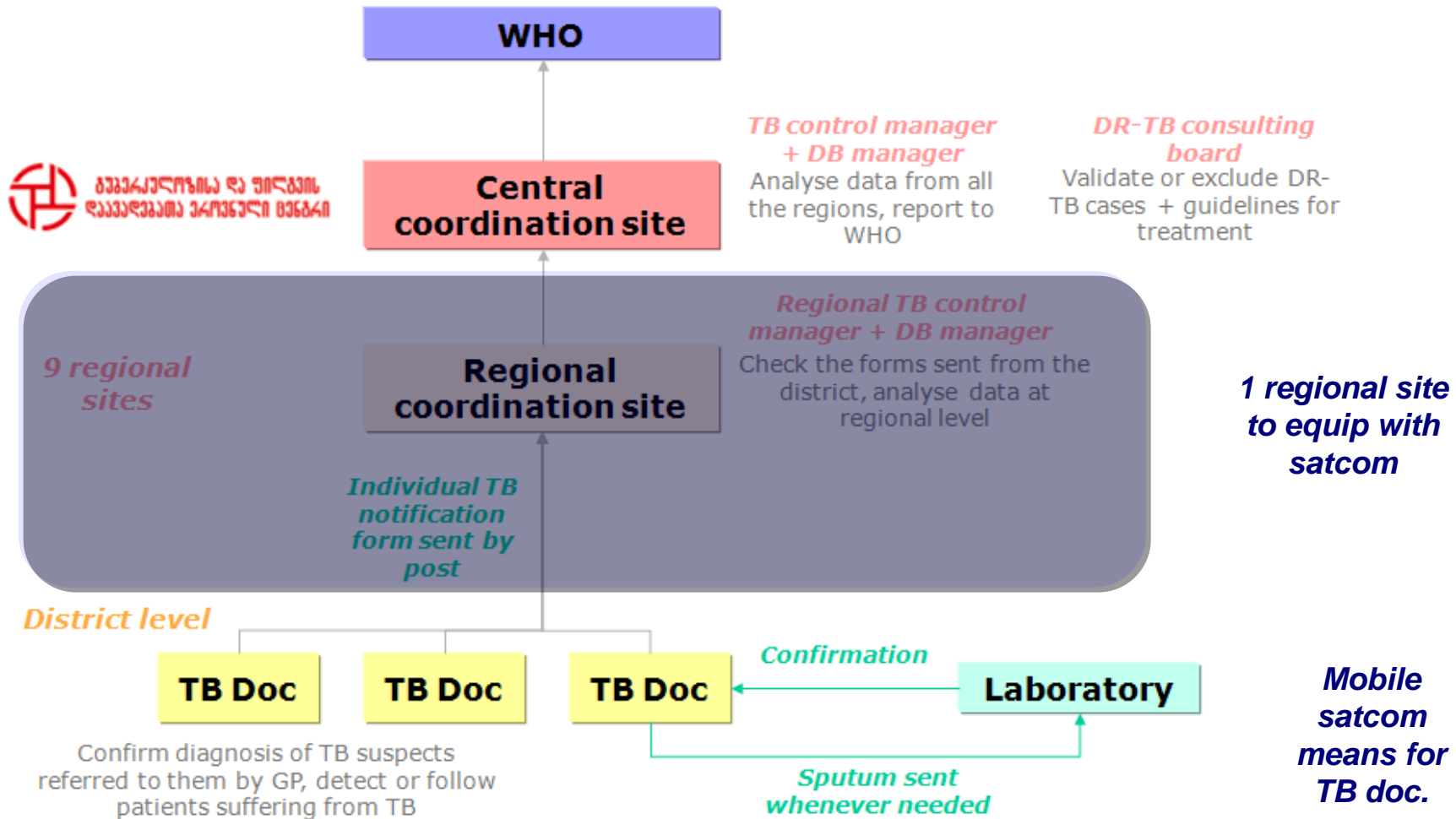
- About 6000 cases detected / year, major problem with MDR and XDR TB

❖ Interest of national centre for TB + health ministry + WHO/EURO/TB

❖ SAFE Georgia Objectives

- To upgrade and validate SAFE solution as a support to **electronic surveillance of Tuberculosis** in Georgia in view of setting up a **sustainable service**
 - ✦ Electronic surveillance network of the cases all over the country
 - ✦ Telmedicine tools for the management of DR-TB cases
 - ✦ To assess the added value of various satcom means and to extend the surveillance network thanks to satcoms.

Requirements



Solutions deployed

❖ MEDES:

- Data collection system (web application)
- Web conference solution

❖ GMV:

- GIS

❖ TTSA:

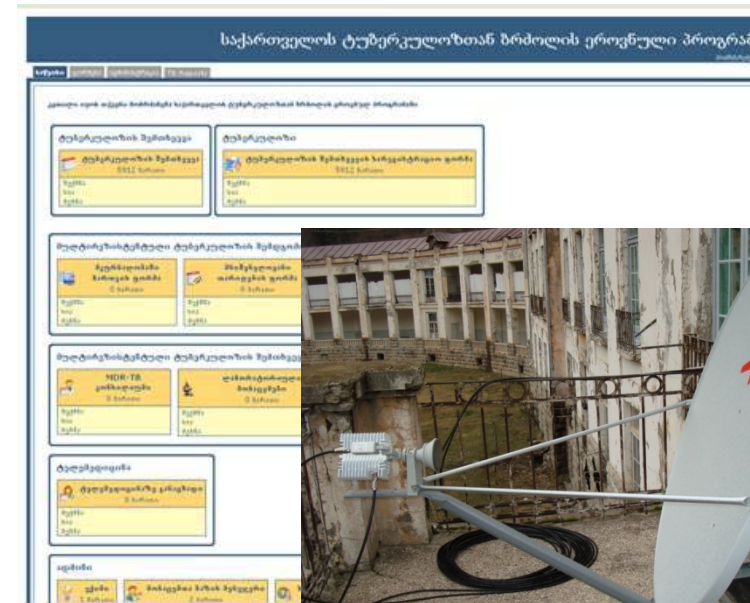
- Satellite communication services

❖ Deployment

- Deployment beg. 2009
- Evaluation between 01/2009 and 01/2010

❖ Satellite communications

- Fix high bandwidth satellite communications (Eutelsat)
- Mobile satellite communications (BGAN)



Assessment (overall system)

❖ Utilisation of the system

- 11 regional DB managers trained and using the system on a daily basis + 1 DB manager for jails.
- Historical data of 2006-2008 entered in the system (more than 18000 entries)
- 13900 new entries entered by users since 1/1/2009
 - ➔ **31900 entries in total**

❖ Report generation

- WHO and NCDC report figures generated with the system

❖ Service assessment:

- Accessibility in time and space, added value of satcoms + flexibility

➔ Became the only system for TB case surveillance and notification, fully operational, used daily, nationwide

Comment of Dr. Archil Salakaia (former head of TBGEO): "this is the best TB information system in the region"

Conclusions of SAFE

❖ **SAFE Georgia initiative**

- Installation of a **sustainable system**
- Routine surveillance - satcoms especially relevant as transition communication means for remote sites or for mobile teams or in case of crises.

❖ **SAFE solution for epidemiological surveillance in a crisis situation**

- Advanced ICT + satcoms ➔ “on-demand” data collection information systems
- **Satcoms very relevant**– resource sharing required
- **Need for pre-positioned infrastructure** & broadband satellite resources
➔ Necessity of a coordinated institutional effort.
- Next step:
 - ⊕ **Transfer SAFE solutions to key players** involved in disaster management: UN organisations, NGO... Currently on-going
 - ⊕ Towards an **open-source European Outbreak Management System**

Other outcomes of SAFE

❖ **SAFE Haiti**

- Deployment foreseen with an NGO in Haiti for syndromic surveillance for health early warning in schools (coll. LIGI and MEDES).

❖ **NOMAD**

- Tracking of food delivery, early rapid assessment in crisis situation (2 NGO, MEDES).

❖ **UNHCR**

- To follow up refugee camps – Preliminary deployment in Congo.

❖ **WHO**

- Expand TB – to improve utilisation of laboratory data for MDR-TB diagnosis.
- On-going action for common open toolbox (collaboration with other providers of open source solutions).
- ...

Future steps

- ❖ **Satcoms have proved to be relevant in this context**
- ❖ **Other satellite services relevant (nav, EO) – integration required**
- ❖ **A preliminary condition - electronic epidemiological surveillance system**

The potential for a more ambitious presence of space in Health Early Warning services

- ➔ **Demonstrations of sustainable services based on integrated satellite-based solutions / IAP program of ESA – PREDICT, VECMAP projects**
- ➔ **Through institutional partnerships with International, European and national bodies and donors in charge of epidemiological surveillance (WHO, UNHCR, ECDC, ...)**
- ➔ **Promoting space assets in this field & facilitating access to the tools / Implementation facility (training, support, evaluations...)**

Other perspectives

- ❖ **Idea of a Breadboarding Lab in this field to increase the knowledge and deployments based on space assets**
 - For NGOs, national authorities, companies...
 - Network of competences (tools for information systems, space assets in this field)
 - Services:
 - ✦ Training – promotion of space assets.
 - ✦ Support for definition of requirements
 - ✦ Breadboarding for pre-deployment
 - ✦ Support for roadmaps for deployment.
- ❖ **Open toolbox to provide the basic services for data collection as a basis to increase the needs for space assets (presented at EU – ICT for Africa workshop, Helsinki, 12/2010)**
 - 1st step 02/2011 – publication of “*Imogene*” as open source under LGPL licence - <http://code.google.com/p/imogene/>
 - Link with other providers of such open tools to create an integrated open toolbox (ex. WHO initiative on TB).