MediLabSecure Situation Analysis on integrated surveillance (MeSA) Study

REPORT on SITE VISIT TO GEORGIA

(12-16 December 2016)
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Acknowledgement

This study was possible thanks to the collaboration and availability of the relevant staff of the Institutions involved in the Surveillance of CCHF in Georgia who generously shared their experiences and discussed the lessons learned.

A special thanks to the National Center for Disease Control and Public Health of Giorgia (NCDC), which coordinated and supported the site visit with professionalism and enthusiasm.

Prof. Francesco Bolici (OrgLab, University of Cassino, Italy) participated in the site visit to explore applicability of business processes modeling to integrated surveillance systems of arboviral diseases. The results of the BPM analysis presented in this report (5.B) are the outcome of a collaborative effort with Nello Augusto Colella (OrgLab, University of Cassino, Italy).

Maria Grazia Dente and Flavia Riccardo have drafted this report with the collaboration of Silvia Declich.

It was finalized and consolidated with the support of Khatuna Zakashvili, Irine Kalandadze, Giorgi Chakhunashvili, Giorgi Babuadze, Nana Mamuchishvili, Paata Imnadze, Gvantsa Chanturia, Ekaterine Adeishvili (National Center for Disease Control and Public Health), Lasha Avaliani, Lena Ninidze, Natia Kartskhia (National Food Agency), Ana Gulbani, Maka Kokhreidze, Marina Donduashvili, Anna Kekelidze (Laboratory of the Ministry of Agriculture).

Stakeholders involved in the Study (Debriefing Meeting, NCDC Tbilisi, 15 December 2016)
1. BACKGROUND

This report describes the Situation Analysis on integrated surveillance conducted in Georgia in the framework of the MediLabSecure Project (the MeSA Study).

MediLabSecure [1] aims at increasing health security in the Mediterranean and Black Sea Regions by enhancing and strengthening preparedness to common health threats. The activities focus on emerging viruses with vector transmission.

The MeSA Study has been designed and implemented by the ISS Team (Maria Grazia Dente, Flavia Riccardo and Silvia Declich) that is leading the WP5-Public Health Working Group of MediLabSecure [2].

Public health activities aim at reinforcing preparedness of the MediLabSecure Network by investigating and improving the standard methods of surveillance of arboviral diseases towards integrated surveillance, integrated risk assessment and early case detection in the framework of One Health. The strategies adopted rely also on the experience and lessons learned gained with the implementation of EpiSouth and EpiSouth Plus Projects [3, 4].

For this Study, the definition of One Health Surveillance provided by K.D.C. Stärk et al. [5] has been adopted: “One Health Surveillance consists of the systematic collection, validation, analysis, interpretation of data and dissemination of information collected on humans, animals and the environment to inform decisions for more effective, evidence- and system-based health interventions”.

One Health surveillance should lead to faster disease detection, more efficient disease control and tangible financial savings when formally compared against separated surveillance streams [5, 6].

While there seems to be consensus about the value of One Health in published studies, there is an evident lack of metrics and associated methods to estimate One Health benefits in a systematic way [7].

The MeSA study can support the evaluation of the One Health benefits. It is the end-point of a study process, in the framework of MediLabSecure project, which identified common criteria to consistently describe and compare how arbovirus surveillance integration occurs in countries, document the impact of the One Health strategy in a national context and assess the level of integration between relevant sectors/disciplines.

The above-mentioned study process had a stepwise approach as per the following scheme:

- Scoping Review – Step 1
- Survey with MediLabSecure members – Step 2
The description of the studies related to the first two steps (Scoping Review, Survey with MediLabSecure members) are available in other documents [8, 9].

The results of these studies will be reported and discussed in the Strategic document on integrated surveillance and risk assessment of arbovirosis in Mediterranean and Black Sea Regions (including Network’s recommendations on future actions aimed at strengthening preparedness and response in the framework of One Health).

2. THE MESA STUDY

The MediLabSecure Situation Analysis (MESA) on integrated surveillance of arboviruses in the Mediterranean and Black Sea Region is a qualitative situational analysis study involving the human, animal and entomology sectors of vector borne disease surveillance in three countries of the Mediterranean and Black sea region participating to the MediLabSecure Project.

General Objective
- Contribute to the integration of laboratory/clinical human, animal and entomological surveillance of arboviruses in the Mediterranean and Black Sea region and encourage inter-sectoral collaboration.

Specific objectives
- Describe how the collection, analysis and dissemination/exchange of information is organized within and between human, animal and entomological surveillance of arboviruses in three countries of the MediLabSecure network,
- Identify formal procedures, informal practices and legal constraints for integrated surveillance and inter-sectoral collaboration in these three countries,
- Discuss main challenges and success stories in establishing a functional inter-sectoral collaboration and integration of surveillance between the human, animal and entomological sectors in these three countries.

The Study is structured in four phases:
1. Selection: selection of three countries to involve in the study ("participating countries");
2. Country Portfolios: development of study tools and collation for each country, in advance of the site visit, of available data/documents to build a country portfolio including a specific checklist;
3. Site Visits: conduction of a site visit in each participating country to investigate processes, procedures and performance in the field of arbovirus surveillance integration between human, animal and entomological sectors in the framework of One Health;
4. Reporting: preparation of a country report for each visited country and distillation of main findings in a strategic document on inter-sectoral integration in the field of arbovirus surveillance. For further details on the study design please refer to the Annex I- Study Design

3. THE MESA STUDY IN GIORGIA: CRIMEAN-CONGO HAEMMORRHAGIC FEVER/VIRUS (CCHF/V) SURVEILLANCE ACROSS THE HUMAN, VETERINARY AND ENTOMOLOGICAL SECTORS

The MeSA Study in Georgia developed on the following steps:

i) First feedback on the experience of Georgia in intersectorial surveillance of CCHF from the MediLabSecure Survey 2014 [8]
ii) Consultations and final agreement to participate in the MediLabSecure MeSA Study, June 2016
iii) Preparation of Study Portfolio and tools (including stakeholders table), October-November 2016
iv) Site Visit to Georgia, 12-16 December 2016
v) Preparation of the Report, February-March 2017

During the visit the following activities have been performed:

a. Present the country situation
b. Visit all stakeholders involved in CCHF surveillance (at least one per each sector: human virology, animal virology, medical entomology, public health) and explore the effectiveness of the surveillance process and communication mechanisms in place between the sectors
c. Debriefing meeting with all the stakeholders involved to discuss and consolidate the information, data, procedures, lessons learned etc., collected through the documentation provided and through the interviews conducted during the visit.

For further details on investigation team, duration and scope of the activities, etc. refer to Annex II - Portfolio of Georgia and its annexes.

4. THE ORGANIZATION OF THE GEORGIAN SURVEILLANCE SYSTEM

Georgia has undergone a profound social and demographic changes since its independence from USSR in 1991.

According to a 2009 WHO Health system analysis [10] the population has shrunk by nearly a fifth to 4.4 million, with an estimated de facto resident population of 3.9 million due to intense out-migration. According to National Statistics Office of Georgia, the population of Georgia (as of January 1, 2016) was estimated at 3,720,000¹. Following the conflicts in Abkhazia and South Ossetia, two regions now largely beyond the jurisdiction of the central Georgian authorities, the population

comprises a large number of internally displaced persons (IDPs). Current administrative division of Georgia, by region/district that are under control of Georgian government, includes 11 regions and 63 districts.

Following independence, Georgia faced a state of economic collapse. The economy improved after 1994 with widening social inequalities. Then, following the Rose Revolution in 2003, the government led a radical change in the economic policy based on government deregulation of financial transactions (to reduce corruption) and trust in market mechanisms. With the National Health Policy, developed in 1999, Georgia has made a significant effort to adapt health policy and the health system to the new social, political and economic environment.

The Georgian Health System transited from a pre-independence Soviet-type Semashko model [11] (a system completely state-controlled and owned where healthcare was free for everybody), to a strongly market-oriented system characterized by privatisation, heavy public budget cuts and decentralization [12].

Today, nearly all health care providers are private actors, independent of the State [13]. Private insurance coverage for households living below the poverty line is paid from public funds, but all other individuals are expected to purchase cover on their own initiative.

Out-of-pocket payments remain the main source of funding for the health system in Georgia, which reduces access for much of the population to services and to pharmaceuticals. Overall, health system regulation is rather weak, particularly when compared with the challenges it faces [13]. The Governmental Commission for Health and Social Reforms, the State Minister of Public Reforms, and Ministry of Labor, Health and Social Affairs (MoLHSA) developed ‘Main Directions in Health 2007–2009’, which outlined the 3-year health sector transformation. It focused on ensuring affordability, quality, accessibility and efficiency on health services. It also introduced market-based principles to health care management. About 80% of the hospitals were sold to the private sector for redevelopment as modern and in most cases as multi-profile hospitals.
Regardless of the complexity of Figure 1, three main closely linked fields can be identified within the Georgian health care system:

1. Public health
2. Primary care setting
3. Hospital sector

The introduction of epidemiologic surveillance into the public health system started in 1996 and the Georgian law ‘on Public Health’ adopted in 2007 refers specifically to communicable disease surveillance.

Since 2009, for surveillance purposes, Center and public health municipal units are using the Electronic Integrated Disease Surveillance System (EIDSS)\(^2\). EIDSS provides real-time biosurveillance throughout Georgia and is being used as a registration, notification, and reporting system for the notifiable diseases/conditions of human cases, and also for veterinary diseases (by the respective structural units of the Ministry of Agriculture).

The EIDSS has 190 data entry points that constitute the Public Health Network of Georgia (Figure 2). 72 notifiable diseases are under surveillance within the system.

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\(^2\) [http://www.ncdc.ge/en-US/ProgramsAndProjects/EIDSS](http://www.ncdc.ge/en-US/ProgramsAndProjects/EIDSS)
Figure 2 - EIDSS Data Entry Points
CCHF passive surveillance started in Georgia in 2009, when the disease reporting tool, the EIDSS, was established nationally.

The surveillance system is based on the “One World – One Health” approach and the integration is implemented also at laboratory level (Figure 3).

Figure 3 - Laboratory surveillance system based on “One World – One Health” approach

**Human surveillance**

CCHF reporting occurs when physicians at Georgian healthcare facilities suspect a patient of having CCHF and report this through EIDSS, which alerts the National Center for Disease Control and Public Health (including a telephone call to stress the urgency). EIDSS detected a median of one CCHF case per year (range: 0–13 cases) from 2009 to 2013, totaling 15 cases during that time period. A case was defined as fever (temperature >100.4°F (>38°C)), one or more hemorrhagic signs (petechial or purpurral rash, bleeding, or thrombocytopenia) and laboratory confirmation (i.e. a positive test for CCHF nucleic acid or anti-CCHF IgM).

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3 Cooperative Biological Engagement Program (CBEP) - [http://www.ncdc.ge/en-US/ProgramsAndProjects/EIDSS](http://www.ncdc.ge/en-US/ProgramsAndProjects/EIDSS)
In 2014 the surveillance system detected 24 cases of CCHF, the highest annual case count since surveillance began in 2009 (Figure 4.) [14]

In July 2016 the first nosocomial case of CCHF was reported.

![Incidence of Crimean-Congo hemorrhagic fever in Georgia by Region in 2014. Source: NCDC of Georgia 2014 (GIS)](image)

Presently suspected CCHF cases are notified to NCDC and samples are sent to the Laboratory of the Lugar Center within 24 hours. Onset time guides the type of laboratory test to be carried out. At the Lugar Laboratory the following diagnostic capacities are available:

**From 2\textsuperscript{nd} to 5\textsuperscript{th} day from symptom onset:**
- Virus isolation
  - The test has a low sensitivity (high viremia needed)

**Up to the 7\textsuperscript{th} day from symptom onset:**
- Viral RNA sequence real time polymerase chain reaction (RT-PCR)
  - Specific, sensitive
- Viral antigen detection
- Detection of antibody (IgG and IgM) by ELISA

**From 5\textsuperscript{th} to 7\textsuperscript{th} day of from symptom onset:**
- IgM (7 days to 4 months) and IgG (7 days to 5 years)
  - Immunohistochemically staining
  - Serum neutralization

**Animal Surveillance**

Animal surveillance is not conducted routinely for CCHFV. During the 2014 epidemic in humans, NFA state veterinarians collected samples from the cows of infected owners. LMA did PCR on 2221 collected samples which resulted all negative. Tests for serology were, and are, not available.

State veterinary surveillance includes clinical inspection of animals at slaughterhouses but does not include sample collection and laboratory analysis of animals.

Animal samples for pathogens are generally sent from the NFA to the LMA. Due to biosafety issues, CCHF represents an exception. In case of suspected CCHF, NFA can send samples directly to the Lugar
Center, the only BLS 3 lab facility in the country, where also staff of the LMA can operate prior booking.

**Entomological surveillance**

The Entomology Department of Lugar Center is in charge for vector monitoring:

a) seasonal monitoring of ticks (early spring - late summer) as per the field surveillance plan prepared by NCDC and approved by MoLSA. In endemic areas, ticks are tested for CCHFV.

b) *Ad hoc* monitoring: during outbreak investigations triggered by any CCHF human case.

Following the 2009 outbreak, Hyalomma distribution maps are being produced to identify the most at risk areas (Figure 5).

![Figure 5 - Distribution of *Hyalomma marginatum* in Georgia 2016](image)

**Vector control**

The Entomology Department of Lugar Center is in charge of:

- entomological investigations of outbreaks of vector-borne diseases in the country and recommends appropriate vector control measures;
- assessment for potential of vector borne diseases and their control;
- evaluation and recommendation for use of various insecticides against vectors of public health importance;
- a reference collection museum of preserved specimens of some medically important arthropods to facilitate identification of the collected material;
- conduction of various ad-hoc and regular training courses on vector-borne diseases and their control among entomologists in the Country
- studies on taxonomy, ecology and biology of vector arthropod species and dynamics of disease transmission.
- support to the monitoring and evaluation of indoor insecticidal spray under taken for the control of VBD in different regions together with NFA
- provision of all necessary equipment for vector collection in the regions

Control plans are developed by NFA with support of the MoA.
Vector control actions are implemented in case of human infection as well as in villages where human cases were notified the previous year. Villages at risk and villages with human cases in the previous years, to avoid re-emergence, are the target each year.

Establishment of an intersectorial Committee
In 2012, a multisectoral team was established to control Anthrax outbreaks. In 2013 it was consolidated as a “One Health” team, including the National Center for Disease Control and Public Health (NCDC), the National Food Agency (NFA), the Laboratory of the Ministry of Agriculture (LMA), Ministry of Agriculture (MoA) and relevant international agencies, to control Brucellosis, Anthrax, Rabies and CCHF. The team meets quarterly or for urgent ad hoc sessions.
Following the 2014 CCHF epidemic, this committee was supported by a Government Decree in 2015 on integrated surveillance for dangerous pathogens and on One Health strategy (after the 2014 CCHF epidemic). Following this epidemic, also a joint action plan (governmental decree) to control CCHF was developed under the coordination of MoLHSA. The plan is not updated yearly. Presently a generic preparedness plan is under development.
LMA is involved only in the case of outbreaks.

Dissemination
NCDC reports to MoLSHA on weekly basis (internal brief report).
Data on CCHF surveillance are included in the monthly and annual reports which are available also on the NCDC website.
Formal minutes are drafted during the One Health meetings.
Data are also used to produce informative brochures and to communicate with the general public. Usually dissemination is carried out by NCDC, on behalf of the other sectors/institutions, but NFA also distributes leaflets/posters for diseases including CCHF.
5. A INSTITUTIONS INVOLVED IN CCHF SURVEILLANCE IN GEORGIA MET DURING THE SITE VISIT

<table>
<thead>
<tr>
<th>Institution</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Center for Disease Control and Public Health of Georgia (NCDC)</td>
<td><a href="http://www.ncdc.ge/">http://www.ncdc.ge/</a></td>
</tr>
<tr>
<td>Laboratory of Lugar Center of NCDC (virology and entomology department)</td>
<td><a href="http://www.ncdc.ge/en-US/LaboratoryNetworksAndBS">http://www.ncdc.ge/en-US/LaboratoryNetworksAndBS</a></td>
</tr>
</tbody>
</table>

**NATIONAL CENTER FOR DISEASE CONTROL AND PUBLIC HEALTH OF GEORGIA (NCDC)**

The National Center for Disease Control & Public Health (NCDC) is the leading agency in the field of public health in Georgia. The history of the agency began as back as in 1937, date when the Plague Station was established. After the independence in 1992, the Georgian Plague Control Station was transformed into the Research Center for Extremely Dangerous Diseases, and after the reforms carried out in the sanitary and epidemiological system in 1995, this Center was established with the status of the National Center for Disease Control (NCDC). In 2003-2007, the Center underwent a large-scale reorganization, which ended up in assuming functions of the Medical Statistics Center and the Public Health Department. In 2013, the Richard Lugar Center for Public Health Research was functionally integrated into the NCDC.

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4 For details on the Institutes involved, see related websites, portfolio and presentations in annex III.
The NCDC, as a Legal Entity under Public Law, is accountable to MoLHSA and is financed with dedicated budgetary allocations from the State Budget. The Center is a leading agency in the prevention and control of communicable and non-communicable diseases at national level. The Center establishes national standards, guidelines, contributes to the improvement of the public health, carries out epidemiological surveillance, immunization programmes, laboratory work and research, provides consultations and responds to public health emergencies. The NCDC maintains health care statistics to facilitate the process of monitoring of the population’s health status and to elaborate relevant policies [15].

There are 2 Zonal Diagnostic Laboratories (ZDLs) in Kutaisi and in Batumi, and 7 Local Surveillance Stations (LSSs) in Georgia. These Centers and laboratories are structured to provide regional coverage (not district). Region is a bigger entity and consists of several districts (the number varies over the different regions).

**RICHARD LUGAR CENTER FOR PUBLIC HEALTH RESEARCH**

The Richard Lugar Center for Public Health Research, which became operational in August 2013, is a new facility of the National Center for Disease Control and Public Health (NCDC). The Lugar center is the top-tiered institution in NCDC’s laboratory network and serves as a reference laboratory of the Georgia’s public health system.
The facility was established as part of a project started in 2004, after a USA – Georgia Umbrella Agreement was signed in 1997 and after a USA – Georgia Implementing Agreement was signed (DoD/MoD) in 2002 on “Cooperation in the Area of Prevention of Proliferation of Technology, Pathogens and Expertise Related to the Development of Biological Weapons”.

The Lugar Center has a BSL3 laboratory that is used by different Institutions in Georgia, including the MoA. A BLS 4 facility is required to handle live CCHFV, however no BLS 4 facilities are available in Georgia. For this reasons, currently all diagnostics on this pathogen are run after samples neutralization at the Lugar BSL3 Laboratory.

**Laboratory Part of NCDC - Lugar Center**

- Genomic Center
- Repository of EDP
- Bacteriology
- Serology
- Molecular Biology
- Virology
- Parasitology
- Cell Cultures
- Entomology
- Vivarium
- CDC/GDD Lab
- WRAIR Lab
- BSL3 designated area for LMA & MES

**Figure 8 – Laboratory part of NCDC**

### NATIONAL FOOD AGENCY OF GEORGIA

This agency (NFA) falls under the MoA and it is divided in three departments: Food Safety, Animal Health and Plant Protection.

With the Government Decree of 2015, following the 2014 CCHF epidemic, vector control actions have been obliged to the NFA. Since 2015, vector control takes place two times by year: in spring and in autumn. The Veterinary Department (animal health Department) under NFA planes and monitors yearly activities that are conducted by regional offices one in each region of the country. NFA Regional offices are staffed with State veterinarians, usually two per district, all directly under the responsibility of NFA.

About six hundred and ten (610) private veterinaries, paid by NFA, are also available for field activities and provided with Standard Operating Procedures for vector control.
The LMA was established in 1907, as a veterinarian laboratory. The facility was reconstructed by the U.S. Defense Threat Reduction Agency (DTRA) in 2007 with a BSL2+ laboratory.

Currently the laboratory is organised in Departments following the same design of the NFA: Animal Health, Food Safety and Plant Protection.

LMA has 2 Zonal Diagnostic Laboratories (ZDLs) in Kutaisi and in Akhaltsikhe plus 8 regional veterinary laboratories (Figure 9) that are operational and inter-connected. All the laboratories (144 staff) can access EIDSS.

![Figure 9 - Laboratories of Network of the Ministry of Agriculture in Georgia with the three ZDL](source MoA http://www.lma.gov.ge/index.php?option=com_map&view=map&Itemid=290&lang=en)

Testing on samples can be requested by NFA or by privates. Only PCR tests are available, not kits for serology. As already reported, CCHF samples are tested at Lugar Center.

**5.B ANALYSIS OF SURVEILLANCE PROCESSES (INTRA/INTER SECTORIAL)**

This analysis was carried out considering the surveillance processes implemented currently and in 2014 when, during the outbreak, surveillance of CCHF involved more extensively all the sectors. More specifically, at the time of the MESA study site visit (December 2016), veterinary surveillance
for CCHF was not operational. However actors referred that, in case of need, it would stepped up following the same processes set up during the 2014 outbreak.

5.8.1 Global View of the Integrated System: Focus on Processes Modelling

The surveillance processes and their inter and intra sectoral connections have been mapped thanks to the support of OrgLab, using the Business Process Modelling Notation (BPMN) methodology, and customized colour coding for each sector (Figure 10).

Why focusing on processes?
The aim of mapping organizational processes is to identify:

i. the set of activities that an organization (or a unit) performs;

ii. the process owner (the person or unit accountable of each activity);

iii. the connections among activities (both inter and intra-unit).

The first step, to understand how a complex system works, is to design a detailed map of all the processes performed by the organization, including their interactions and the task-owners. The process analysis allows us to identify the areas for improvement, as for example overlapping tasks (multiple owners claiming responsibility over a specific activity), or activity gap (when an activity does not formally have an owner, or when two activities that should cooperate do not have a shared way to work together).

What is Business Process Modelling (BPM)?

Business Process Modeling (BPM) is a representational framework designed to visually “describe how businesses conduct their operations” and typically involve “graphical depictions of at least the activities, events/states, and control flow logic that constitute a business process” (Curtis et al., 1992). A process is defined as a set of activities executed in a predefined, sequential or parallel, order by a pre-determined number of organizational actors or entities sharing the collective goal of reaching organizational objectives (Chinosi and Trombetta, 2012). The term “business process modeling” and its related representation methodologies are not necessarily limited to the business environment but can be used in any scenario in which organizations are structured in a complex net of tasks and their interactions. In fact, BPM was developed for those processes that are so complex and distributed (as in the case of infectious diseases identification, early warning and response), that require a standardized and refined representation system to be effectively transmitted and clearly understood by a broad variety of individuals and units. BPM methods have been increasingly in vogue among analysts and organizational specialists, used both to create AS-IS representations of current practices, aiming at knowledge transfer, as well as to serve as an analytical tool to improve the efficiency or effectiveness of the analysed processes (TO-BE).
What is Business Process Modelling Notation (BPMN) standard?

Among the many BPM standards, Business Process Modelling Notation (BPMN) has become increasingly popular among both practitioners and scholars, because provides a comprehensive and easy to read visual modelling methodology. Indeed, BPMN’s shared representation techniques and symbols are specifically aimed at allowing a better analysis, understanding and diffusion of complex processes (Birkmeier & Overhage, 2010; Chinosi & Trombetta, 2012). In particular, BPMN provides a series of constructs aimed at facilitating a precise and understandable visual representation of events, processes and logical connections between them. These include, among others: graphical depiction of process participants (swimming lanes), data management and exchange (information and message flows, databases), activity markers (sub processes, loops, and parallelization) and time or condition-based event constrains (Figure 10).

Considering the informative power of the approach, and on the basis of previous successful experiments of using BPMN to represent health-related processes (e.g. Müller & Rogge-Solti, 2011) for multidisciplinary hospitals; Rolòn et al. (2010) for hospital management processes; Lang et al. (2007) in radiology workflows; Huang, Tseng, Hsu, Lee, & Chu (2015) for multi-functional units involved in diagnostic processes), we find BPMN to be the most appropriate approach for the task of creating a visual representation of integrated infectious diseases surveillance, early warning and response processes.

BPM methodology and data collection in the Georgian surveillance system

The BPM was performed in three phases:

i. written material about Georgian surveillance system were studied to reach a general understanding of the involved organizations;

ii. data collection was performed during the site visit in Tbilisi interviewing the actors involved in the processes. A first round of interviews was conducted with each unit (multiple experts belonging to the same unit were interviewed together, in order to facilitate the representation of the process as commonly perceived and understood by the whole unit). During the interviews, a first provisional sketch of the process was drawn and the Georgian experts were asked to check if the representation would embed their understanding of the process. If the graphical representation was not detailed enough, the BPM analyst described verbally the process to check that he accurately understood the process as described by the members of the unit. After each meeting the BPM analyst and the ISS experts checked that the process-models were accurate also from the specific domain under study (surveillance). A second crucial step was to meet all the Georgian experts in the same room, projecting the whole process (combination of the processes of several units) and describing the processes to them. In this way we were able to identify possible misunderstanding and to correct them, but even more important we were able
to let different experts belonging to different units to compare their idea of working process also in relationship with the work performed by other units.

iii. after the site visit, the processes have been detailed following BPMN2.0 standards and also described in textual form. The inter-sectorial connections have been designed and analysed as well as the intra-unit processes.
- **Intra-sectorial** message and communication flows are given the sector specific color and identified by the first letter of the sector name together with a number (e.g., H1 for human).

- **Cross-sectorial** message and communication flows are in red color and identified by an X (cross), the first letter of the destination sector and a number (e.g., XV3: third cross sectorial communication flow to veterinary sector)

Figure 10 – Legend for the interpretation of the surveillance process diagrams
Overall, the surveillance system comprises three sectors: the entomological sector (orange), the veterinary sector (green) and the human surveillance sector (blue), with increasing levels of complexity as shown by the number of recognized lanes (each with a different involved actor) and numerous inter and intra connections (Figure 11). The cross sectorial communication flows are indicated as follows:

- **XV1** – First cross sectorial communication flow to Veterinary Sector. From PHC (Human Sector) to Veterinary Regional Office.
- **XV2** – Second cross sectorial communication flow to Veterinary Sector. From NCDC Epidemiologist (Human Sector) to National Food Agency.
- **XV3** – Third cross sectorial communication flow to Veterinary Sector. From NCDC Epidemiologist (Human Sector) to National Food Agency (process as it was in 2014).
- **XH1** – First cross sectorial communication flow to Human Sector. From National Food Agency (Veterinary Sector) to NCDC Epidemiologist.
- **XE1** – First cross sectorial communication flow to Entomology Sector. From NCDC Epidemiologist (Human Sector) to Lugar Entomology.
- **XE2** – Second cross sectorial communication flow to Entomology Sector. From Lugar Center BLS3 (Human Sector) to Lugar Entomology.
- **XH2** – Second cross sectorial communication flow to Human Sector. From Lugar Entomology to Lugar Center BLS3.

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**System Overview:** interactions among different units and areas (Fig.11)
- Overview Zoom – Part 1 – Human Sector (Fig.11a)
- Overview Zoom – Part 2 – Veterinary Sector (Fig. 11b)
- Overview Zoom – Part 3 – Entomology Sector (Fig. 11c)
- In-detail text descriptions of each sector’s processes BPMN representation

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  - Fig. 12 - Human Sector Overview
  - Fig. 13 - Human Sector Zoomed part 1
  - Fig. 14 - Human Sector Zoomed part 2

**Veterinary Sector:**
- Veterinary SECTOR process summary
  - Fig. 15 - Veterinary Sector Zoomed

**Entomology Sector:**
- Entomology SECTOR process summary
  - Fig. 16 - Veterinary Sector Zoomed
Figure 11 – Overview of the interactions among different units
Figure 11b – Overview Zoom – Part 2 – Veterinary Sector
5.B.2 HUMAN SECTOR

The Human Surveillance Sector was described through interviews conducted at the NCDC and Lugar Centre and integrated with documentation and comments provided during the debriefing meeting at the NCDC.

The Human Surveillance Sector is the largest sector of the integrated surveillance system. This is in line with the fact that CCHF is perceived as a health issue only for humans, because animals do not show symptoms of infection. We identified 8 lanes comprising the following clinical, laboratory and public health actors (Figure 12-14): Hospital, Primary Health Care (PHC); Local (LSS) and Zonal (ZDL) health authorities, NCDC Epidemiologists, Lugar Centre.

The following section provides a brief process description by lane.

5.B.2.1 HUMAN SECTOR PROCESS SUMMARY

Hospital Lane

1. Process starts when a suspect case is identified
2. The parallel gateway that follows indicates that hospitals proceed to:
   a) Send notification to the PHC
   b) Organize the patient transfer to the Central Hospital for Infectious Diseases
c) Collect blood samples from the patient, wait for the LSS’s car and, when it arrives, deliver the sample.

**PHC Lane - 1**
1. The process starts upon receiving hospital’s notification of suspect case.
2. The subsequent parallel gateway indicates that PHC proceed to:
   a. Alert LSS
   b. Alert Veterinary Regional Office (XVI information flow)
   c. Contact Tracing – To database
   d. Collect clinical data on the patient (performed at the Hospital) which is then added to the newly opened suspected case file.
   e. Alert the epidemiologist.

**LSS Lane**
1. The process starts upon receiving the alert from PHC.
2. After receiving the alert, if needed, a car is sent to collect the blood samples from the hospital.
3. Upon receiving the samples, these will either:
   a. Be transported to Lugar Center BLS3
   OR
   b. Be transferred to ZDL which will collect the sample and transport it to Lugar Center BLS3

**NCDC Lane – 1**
1. The process starts upon receiving the communication of suspect case from PHC.
2. Contact tracing (among people involved in the transport of the patient – Ambulance- and at Tblisi Hospital) is performed and related data is added to EIDSS.

**Lugar Center BLSS3 Lane - 1**
1. The process starts upon receiving the patient’s sample from either from ZDL or LSS.
2. Analysis is performed. Depending on the number of days passed it can be done with: PCR; Serology AND PCR; Only Serology
3. The case can be: Confirmed; Probable; Not CCHF case
4. When the answer has been provided, proceed to make the phone call and fill and sign the form then send it by e-mail to Epidemiologist.
5. The last step involves 1 event and 2 processes:
   a. E-mail to epidemiologist sent
   b. Archive the written forms
   c. Add the data to the EIDSS Database
NCDC Lane – 2
1. E-mail from Lugar Center is received and EIDSS database is updated.
2. If results are negative both physician and PHC are informed.
3. If results are positive: both physician and PHC are alerted via phone call, then
   a. Veterinary and entomology sectors are informed (XV2, XV3 information flows).
   b. Population is informed
   c. Follow up of contacts is performed and database is updated
4. If at least one confirmed or probable case is detected, Veterinary and entomology sectors are
   informed (XV2, XV3 information flows).
5. If no cases are detected among contacts the database is updated with results.

Lugar Center BLSS3 Lane – 2
1. Process starts when ticks and mice samples are received from Lugar entomology (XH2 information
   flow)
2. PCR is performed and results are sent back to Lugar entomology (XE2 information flow) and added
to the EIDSS database.

PHC Lane – 2
1. Positive results’ report-phone call is received from epidemiologist
2. Population is informed and follow up of the contacts is performed
3. EIDSS database is updated.
Figure 12 – CCHF surveillance process in Georgia, Human sector overview
Figure 14 - CCHF surveillance process in Georgia, Human sector detail, part 2
5.B.3 VETERINARY SECTOR

The Veterinary Surveillance Sector was described through interviews conducted at the National Food Agency of Georgia and at the Laboratory of the Ministry of Agriculture, and integrated with documentation and comments provided during the debriefing meeting at the NCDC.

In this sector, we identified 4 lanes comprising the following clinical, laboratory and animal public health actors: the National Food Agency (NFA) central office, the Laboratory of the Ministry of Agriculture (LMA) and the NFA Veterinary Regional Office.

The following section provides a brief process description by lane:

5.B.3.1 VETERINARY SECTOR PROCESS SUMMARY

Veterinary Regional Office - 1
1. Process starts upon receiving the alert from PHC (XV1 information flow)
2. After the alert is received a need assessment for vector control is performed and NFA central office is contacted and alerted with a phone call and a mandatory written form.

National Food Agency- Veterinary Dept.
1. Process starts when:
   a. Notification from veterinary regional office or human sector’s epidemiologist (XV2 information flow) is received
   OR
   b. Twice per year according to vector control plan
2. NFA activates veterinary regional office (phone call and send form)
3. When results from veterinary regional office are received, these are communicated to NDCC (XH1 information flow).
4. Guidelines are sent to Veterinary Regional Office

Veterinary Regional Office – 2
1. When activated by NFA the team goes to NFA to collect equipment
2. Vector control is performed, following the eventually received guidelines, in the affected area.
3. Reports back to NFA
National food Agency 2014

The process labelled as “National food Agency 2014” (in light green) represents the specific activities that have been implemented only to deal with the emergency crisis in that year. These specific processes are not currently active.

1. Process starts when alert from human sector’s epidemiologist is received (XV3 information flow)
2. Central level Team is sent to collect samples
3. Samples are transferred to LMA
4. When results are received from LMA the process ends

LMA

1. Process starts when samples arrive from NFA
2. PCR is performed on samples
3. Results are sent to NFA and archived
Figure 15 - CCHF surveillance process in Georgia, Veterinary sector overview. Current processes in darker green, processes during the 2014 outbreak in lighter green.
5.B.4 ENTOMOLOGY SECTOR

The Entomology Sector was described through interviews conducted at the Lugar Centre and integrated with documentation and comments provided during the debriefing meeting at the NCDC. The following section provides a brief process description by lane.

5.B.4.1 ENTOMOLOGY SECTOR PROCESS SUMMARY

1. Process starts upon receiving alert from human sector epidemiologist (XE1 information flow)
2. A team is sent to collect ticks and mice.
3. Subsequent processes are performed in parallel:
   a. An entomology file is opened on the EIDSS database
   b. Mice and ticks are transferred to Lugar center (XH2 information flow)
4. Results are received from Lugar center (XE2 information flow).

![Figure 16 - CCHF surveillance process in Georgia, Entomology sector overview.](image-url)
6. DISCUSSION

The Georgian surveillance system of infectious disease has, since many years, a robust approach towards integration between sectors and the One Health strategy. This is proved by the institution of the EIDSS network and the EIDSS reporting tool in 2009. It includes 190 sites (90 sites represent MoLHSA facilities, 97 represent MoA facilities, and 3 are shared by the two Ministries), that share data and information through an single national system used by over 350 public health facility employees. On MoA side, EIDSS is used by the NFA regional, district and central veterinarians, as well as the LMA and its subordinate regional branches. EIDSS is currently used as one of the means of information exchange between MoLHSA and MoA.

Sectors integration was enhanced by the establishment, in the 2012, of a multisectoral team to control Anthrax outbreaks. In 2013 this team was consolidated as a “One Health” team to control Brucellosis, Anthrax, Rabies and CCHF. All the sectors agree that the consolidation of the multisectoral team can help also with other relevant issues in need for integrated approach, like the Antimicrobial resistance (AMR). Moreover, governmental decrees may promote ad hoc collaborations between sectors in case of needs.

Specifically for CCHF, the mutisectoral approach (including the One Health Team) seems be operationally oriented more towards response than early warning. Presently, early warning based on veterinary or entomological surveillance is not available and the control and response measures are triggered by the first human case.

It is mainly for this reason that the NCDC is the leading institution in the CCHF surveillance and has a relevant role in the integration and within the One Health Team.

However, considering its potential in monitoring vectors (presence/absence and infection), the entomology department at the Lugar Centre can provide relevant support for early warning by identifying at risk areas ahead of human cases. Currently at risk areas for CCHF are identified on the basis of the presence of the vectors or human cases in the previous years.

EIDSS has been conceived also as an early warning tool, with “alert” messages sent automatically to and from all the sectors involved. The EIDSS Entomological section has been described as currently rudimental and in need of development in line with this early warning potential.

The working context is conducive to interaction, all the stakeholders are motivated and not many referents to be consulted.

Notwithstanding the above, some challenges have been reported and discussed:

- The collaboration with the veterinary sector is not always easy, due to the almost absent impact on the animals, the information is often missing or inaccurate;
Coordination and collaboration on vectors monitoring and control between NFA and the Entomology Department at the Lugar Center should be enhanced;

Lack of collaboration between public and private hospitals in Tbilisi, especially during outbreaks, could hamper the impact of public health actions.

From the analysis of the surveillance processes, and their inter and intra sectoral connections mapped using the BPMN methodology, emerged, as expected, that the Human sector is in charge of the majority of the activities and it has a central role. Focusing on the cross-sectorial communication flows (represented in the graph with the letter X) we notice that most of the exchanges happen between the Human sector and one of the other areas (Veterinarian or Entomological). This is coherent with the main purpose to preserve as much as possible human lives and thus to always reach a certain level of coordination with such units. Looking more in details, we can also notice that connection both inter and intra units have mainly two actors involved: NCDC Epidemiology and Lugar Center BLS3. These two units are acting de-facto as coordination brokers since most of the tests are performed in the Lugar Center BLS3 and a consistent part of time-sensitive actions and decisions are taken between the NCDC Epidemiology and the BLS3. The role of coordination brokers of these two units is also stressed by the consideration that there is a certain number of not formalized information exchange embedded in the processes, especially in case of a positive confirmation of infection. As emerged by the interviews, the Georgian experts expect that informal communication (mainly as direct phone calls) would happen in case of time-sensitive information.

Another interesting aspect emerging from the analysis is the consideration that the NFA in 2014, during the CCHF epidemic, was able to set and run a specific pattern of activities needed to respond to the contingent emergency, showing the ability to be flexible to unexpected needs. In 2017, the same processes are not performed because there is no need, but the members of the unit explicitly explain that they will be ready to resume the same processes even in a more efficient way in case of emergency, because now “they know how to do it”. This shows the importance to preserve those competencies and knowledge that may not be of immediate use in the short term, but that can save time and improve the results if and when an emergency will rise.

7. CONCLUSIONS

Georgia has been experimenting intersectorial surveillance integration for CCHF disease, both with intra-sectorial and inter-sectorial collaboration processes, for several years.

The analysis reported in the previous chapters are based on the information collected during the interviews, guided by the study’s check list (see in annex II of the Portfolio), with key stakeholders working at the Institutions involved in CCHF surveillance in Georgia.
The information, data, procedures, lessons learned etc. collected were preliminary elaborated during the site visit by the ISS/OrgLab team and presented and consolidated during the debriefing meeting, with all the relevant stakeholders, held in the last day of the mission (15 December) at the NCDC (see annex IV).

In order to assess and document the level of integration between sectors, we identified possible criteria [8], proposed on the basis of an existing operational protocol and procedures [17].

The current levels where inter sectorial integration of CCHF surveillance has been implemented in Georgia, in accordance with the identified criteria, is reported in Table 1.

Table 1. Levels of intersectorial CCHF surveillance integration, Georgia, 2016

<table>
<thead>
<tr>
<th>Level of integration</th>
<th>Sublevels of integration</th>
<th>The Georgian example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy and institutional level</td>
<td>Policy level</td>
<td>Legislation issued by the Government (2015) has created the One Health intersectorial committee at national level NCDC covers the Human Health and Entomology and refers to the Ministry of Health Presence of formal institutional collaboration mechanisms within other sectors (as during the 2014 outbreak)</td>
</tr>
<tr>
<td>Institutional level</td>
<td>Presence of informal collaboration mechanisms (across sectors and within the human health sector) Presence of a strategic plan developed after CCHF epidemic in 2014 which is presently being developed in a generic preparedness plan</td>
<td></td>
</tr>
<tr>
<td>Data collection and analysis level</td>
<td>Interoperability mechanisms at data collection level</td>
<td>EIDSS Electronic Integrated Disease Surveillance System across all sectors</td>
</tr>
<tr>
<td></td>
<td>Interoperability mechanisms at data analysis level</td>
<td>Potential with the EIDSS, but presently used across human epi and virology</td>
</tr>
<tr>
<td>Dissemination level</td>
<td>Information and reports are shared across sectors during the One Health Meetings every 3 months</td>
<td></td>
</tr>
</tbody>
</table>

The main criteria related to integration in place, seem to be fulfilled in the Georgian surveillance system.
Considering that, as anticipated in background, the One Health surveillance should lead to faster disease detection, more efficient disease control and tangible financial savings when formally compared against separated surveillance streams [5,6], further studies are needed to evaluate the impact of these surveillance plans to systematically quantify the costs and benefits of this integration.

8. REFERENCES

9. Maria Grazia DENTE, Flavia RICCARDO, Jean-Claude MANUGUERRA, Camille ESCADAFAL, Miguel Angel JIMENEZ-CLAVERO, Elisa PEREZ RAMIREZ, Vincent ROBERT, Marie PICARD, Lobna GAAYEB, Kathleen VICTOIR, Silvia DECLICH on behalf of the MediLabSecure Network Strengthening preparedness to arbovirus infections in Mediterranean and Back Sea Countries: towards common criteria to assess and report on One Health strategy. Abstract accepted at the MEdiPIET Annual Scientific Conference 2016


Annexes
Annex I
MediLabSecure

Situation analysis on integrated surveillance of arboviruses in the Mediterranean and Black Sea Region

MeSA Study Design
The MeSA Study was designed by Flavia Riccardo (ISS), Maria Grazia Dente (ISS) and Silvia Declich (ISS).

MediLabSecure is a continuation of the “EpiSouth plus” project (2010-2013). The project is funded by the European Union DEVCO/EuropeAid (Contract Number: IFS/2013/330 961). The Project is led by the Institut Pasteur and counselled by an Advisory Board composed by international experts.
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1. Introduction

1.1 THE MEDILABSECURE PROJECT

Countries of the Mediterranean and Black Sea regions have common sea borders and, as a result, share common public health issues and threats. MediLabSecure is a European project (2014-2017) that aims at consolidating a Public Health and Laboratory Network on emerging zoonotic vector borne viruses.

It represents a cluster for awareness, risk assessment, monitoring and control of these vector borne diseases. This cluster pursues the interaction of four sub-networks, one laboratory network for human health, one laboratory network for animal health, one laboratory network for entomology and one network for public health reinforcement. The MediLabSecure network includes partner countries around the Mediterranean and Black Sea Regions (19 non-EU countries).

1.1.1 General objectives

- Create a framework for collaboration to improve surveillance and monitoring of emerging vector borne viral diseases (arboviruses)
- Provide training in participating countries to increase the communicable disease control in the Mediterranean and Black Sea region.
- Promote knowledge development and transfer of biosafety best laboratory practices

1.1.2 Specific objectives

Prevent spread of viruses and concerned vectors (mosquitoes):

- Prevent outbreaks of zoonotic viruses with an existing identified or potential risk in the region (West Nile, Dengue, Chikungunya, Yellow Fever, Rift valley fever, ...)
- Improve integrated surveillance (animal, human, entomological)
- Provide risk assessment of the different emerging viruses (transmission, spread, human impact...)
- Recommend and implement public health measures for control where possible

For more information, visit http://www.medilabsecure.com/project.html

1.1.3 WP5- Public Health

Public health activities will reinforce the laboratories’ consortium by investigating and improving where possible the standard methods of surveillance towards integrated surveillance, risk assessment and early case detection. The harmonization of methods for epidemiological surveillance in the three areas of human and animal virology and medical entomology will facilitate data exchange and data management, which ultimately will improve prevention and control.

In particular, the WP5 aims at assessing the current national situations in terms of integrated surveillance: which kind of links/procedures exists in the countries involved between the animal virology, human virology and medical entomology entities and the central national surveillance system.
These links/procedures will be verified and described through a national situation analysis (MeSA Study) to be carried out in a pool of three countries. The identified gaps and needs will inform the other WPs and the identified relevant case studies and lessons learned will be shared with all the countries involved in order to enhance inter-sectoral integration of surveillance.

The design of this study is based also on the experiences gathered during the conduction of the EpiSouth Plus National Situation Analysis of coordination of surveillance between Points of Entry and National Health Systems [1].

1.2 OBJECTIVES OF THE MESA STUDY

The MediLabSecure Situation analysis on integrated surveillance of arboviruses in the Mediterranean and Black Sea Region (MeSA Study) is a qualitative situational analysis study involving human, animal and entomology sectors of vector borne disease surveillance in three countries of the Mediterranean and Black sea region participating to the MediLabSecure Project.

1.2.1 General Objective

The goal of The MeSA study is to:

Contribute to the integration of laboratory/clinical human, animal and entomological surveillance of arboviruses in the Mediterranean and Black Sea region and encourage inter-sectoral collaboration.

1.2.2 Specific objectives

1. Describe how the collection, analysis and dissemination/exchange of information is organized within and between human, animal and entomological surveillance of arboviruses in three countries of the MediLabSecure network,

2. Identify formal procedures, informal practices and legal constraints for integrated surveillance and inter-sectoral collaboration in these three countries,

3. Discuss main challenges and success stories in establishing a functional inter-sectoral collaboration and integration of surveillance between the human, animal and entomological sectors in these three countries.

1.3 MESA SITUATION ANALYSIS INVESTIGATORS

The national situation analysis will be guided and performed by a team of investigators (hereby Situation Analysis investigators) comprising MediLabSecure Focal Points of participating countries, the WP5 leaders and subject matter experts. The PH Focal Points of participating countries will participate in all the study phases.

1.4 PHASES OF THE MESA STUDY

The MeSA study is structured in four phases:

1. Selection: Selection of three countries to involve in the study (hereby called “participating countries”).
2. Country Portfolios: Development of study tools and collation for each country, in advance of the site visit, of available data/documents to build a country portfolio including specific scenarios/check lists.

3. Site Visits: Conduction of a site visit in each participating country to investigate processes, procedures and performance in the field of arbovirus surveillance integration between human, animal and entomological sectors in the framework of One Health.

4. Reporting: Preparation of a country report for each visited country and distillation of main findings in a strategic document on inter-sectoral integration in the field of arbovirus surveillance.

2. Relevant background information

2.1 SURVEY ON THE LEVEL OF INTEGRATION BETWEEN THE ANIMAL VIROLOGY, HUMAN VIROLOGY AND MEDICAL ENTOMOLOGY ENTITIES WITH THE CENTRAL NATIONAL SURVEILLANCE

In order to assess and document the level of integration between the animal virology, human virology and medical entomology entities with the central national surveillance system we identified criteria, reported in table 1., proposed on the basis of existing operational protocols and procedures [2, 3, 4] and assessed with a scoping literature review [5].

*Table 1 – Proposed criteria to describe existing levels of integration between human/animal/entomological surveillance for a specific exposure*

<table>
<thead>
<tr>
<th>Level of integration</th>
<th>Sublevels of integration at data collection level</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy and institutional level</td>
<td>Policy level</td>
<td>1. Existence of a National policy addressing integrated surveillance for this specific exposure</td>
</tr>
<tr>
<td></td>
<td>Institutional level</td>
<td>2. Existence of a policy addressing integrated surveillance for this specific exposure at subnational level</td>
</tr>
<tr>
<td></td>
<td>Interoperability mechanisms at data collection level</td>
<td>3. Existence of agreements among the institutions involved in human/animal/entomological surveillance for the specific exposure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Existence of a coordination mechanisms among the institutions involved,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Existence of identified focal points for each of human/animal/entomological surveillance for the specific exposure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Existence of integrated data collection tools</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Existence of activation mechanisms of human surveillance based on signals from animal/entomological surveillance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Other interoperability mechanisms at data collection level</td>
</tr>
</tbody>
</table>
On the basis of the three critical levels reported in the table, we designed a survey targeting all the contact points of the project that could explore:

1) the existence of a national policy addressing integrated surveillance;

2) the existence of coordination mechanisms among the institutions involved;

3) the existence of integrated data collection tools and

4) the existence of joint result dissemination mechanisms such as bulletins, reports, papers, media reports and/or websites.

We then assessed the level of surveillance integration in the 19 countries of the project splitting them in three regions (Table 2.).

Table 2 - Countries and regions involved

<table>
<thead>
<tr>
<th>Balkans</th>
<th>Black Sea</th>
<th>North Africa and Middle East</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>Armenia</td>
<td>Algeria</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>Georgia</td>
<td>Egypt</td>
</tr>
<tr>
<td>Kosovo</td>
<td>Moldova</td>
<td>Jordan</td>
</tr>
<tr>
<td>Montenegro</td>
<td>Ukraine</td>
<td>Lebanon</td>
</tr>
<tr>
<td>Serbia</td>
<td></td>
<td>Libya</td>
</tr>
<tr>
<td>The Former Yugoslav Republic of Macedonia</td>
<td></td>
<td>Morocco</td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
<td>Palestine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tunisia</td>
</tr>
</tbody>
</table>

We performed a frequency analysis for all categorical variables, and the proportions of responses were calculated on the basis of the number or respondents for each question.

Fifty-six contact points (CP) from laboratories (animal virology, human virology and medical entomology) and 19 contact points (CP) from Public Health Institutes (PHI)/Ministries of Health (MoH) (human epidemiology) from the 19 countries were invited to participate in the survey between December 2014 and July 2015.

We obtained responses from 51 laboratories (51/56; 91%) and 12 PHI/MoH (12/19; 63%), of whom: 14 were from the Black Sea, 26 from North Africa and the Middle East and 23 from the Balkans.
Human virology laboratories (19/63; 30%) were the most represented, followed by animal virology laboratories (18/63; 29%), medical entomology laboratories (14/63; 22%), and human epidemiology experts (12/63; 19%).

2.1.1 Main findings of interest for the MeSA Study:
Thirty-four responders (34/63; 54%), of 17 countries, reported the availability of a National policy addressing integrated surveillance in their countries. When considering the result by sub-regions we found national policies to be available for 57% (8/14) of the Black Sea respondents, 62% (16/26) of North Africa and Middle East respondents and 43% (10/23) of Balkan responders.

Positive replies were given by 50% (9/18) of all animal virology respondents, 42% (8/19) of human virology respondents, 50% (7/14) of medical entomology respondents and 83% (10/12) of human epidemiology respondents.

Thirty-one respondents (49%), of 16 countries, reported the existence of coordination mechanisms among the institutions involved, of whom 57% (8/14) of the Black Sea respondents, 54% (14/26) of North Africa and Middle East respondents and 39% (9/23) of Balkan respondents. Positive replies were given by 56% (10/18) of all animal virology respondents, 47% (9/19) of human virology respondents, 29% (4/14) of medical entomology respondents and 67% (8/12) of human epidemiology respondents.

Integration mechanisms in data collection were reported by 29% (18/63) of all respondents, of 11 countries. This response was positive among 29% (4/14) of all the Black Sea respondents, 27% (7/26) of North Africa and Middle East respondents and 30% (7/23) of Balkan respondents. Positive replies were given by 11% (2/18) of all animal virology respondents, 32% (6/19) of human virology respondents, 21% (3/14) of medical entomology respondents and 58% (7/12) of human epidemiology respondents.

Thirty-four respondents (34/63; 54%), of 16 out of 19 countries, reported the availability of joint results dissemination mechanisms in their countries. This response was positive among 43% (6/14) of all the Black Sea respondents, 69% (18/26) of North Africa and Middle East respondents and 43% (10/23) of Balkan respondents. Positive replies were given by 44% (8/18) of all animal virology respondents, 58% (11/19) of human virology respondents, 57% (8/14) of medical entomology respondents and 58% (7/12) of human epidemiology respondents.

Table 3 – Inter-sectoral integration reported by region

<table>
<thead>
<tr>
<th>N Respondents reporting integration</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of integration</td>
<td>Sublevels of integration</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Policy and institutional level</td>
<td>Policy level</td>
</tr>
<tr>
<td></td>
<td>Institutional level</td>
</tr>
<tr>
<td>Data collection and analysis level</td>
<td>-</td>
</tr>
<tr>
<td>Dissemination level</td>
<td>-</td>
</tr>
</tbody>
</table>

For further details on the study, see [6]

**2.2 EXERCISE ON WEST NILE VIRUS RISK ASSESSMENT DURING THE MEDILABSECURE MID-TERM MEETING**

During the mid-term Meeting of the MediLabSecure Project (15-17 December 2015), the Multisectorial Exercise on Risk Assessment was organised and conducted. This exercise was designed to foster small group discussion on surveillance integration in the framework of One Health, on the status of West Nile Virus surveillance in the region also in relation to what proposed in the ECDC tool and on the applicability of the ECDC tool in a non EU context (report available at http://www.medilabsecure.com/documents/site/report_midterm_meeting_web.pdf).

During this exercise, each country table (including participants from the same country and different professional sectors) conducted a SWOT analysis on the basis of a predefined template looking at:
- Strengths in the country in relation to surveillance in place and the risk level assessed.
- Weaknesses in the country in relation to surveillance in place and the risk level assessed.
- Opportunities in the use of the ECDC tool in their context.
- Challenges in using the tool in their context.

Findings were then discussed in the whole group and summarized in a single subregional SWOT output that was included in the last restitution slide.

Recurring strengths that were mentioned in relation to WNV surveillance included:
- The existence of consolidated surveillance systems for WNV infection including entomological surveillance, animal surveillance and human surveillance,
- Existing laboratory capacity and expertise, and
- In some countries, the existence of multisectorial collaboration mechanisms across disciplines was also mentioned.

The most recurring mentioned weaknesses were:
• The need to strengthen intersectorial collaboration,
• The need to strengthen laboratory capacity for differential diagnosis and confirmation of WNV, and
• The need to strengthen surveillance systems (e.g. through active surveillance).

Some countries reported that WNV is not considered a priority for public health. These participants highlighted a lack of awareness of WNV among authorities/physicians/general public and of political commitment in supporting targeted preparedness activities.

3. MeSA phase 1: Selection

The MeSA study aims to analyse success stories in integration of arboviral disease surveillance across the human, animal and entomological sectors. To this end, the selection builds on the findings of the survey conducted by the MediLabSecure project, as well as on country discussions held during the Midterm project Meeting (15-17 December 2015).

Coordination complexity among stakeholders involved in surveillance activities across the human, animal and entomological sectors both in laboratories and in the National Surveillance System could vary according to the size of the country and its type of health system.

What is seen in large countries and a more federal organization with many intermediate levels of competency, may not reflect the situation in smaller settings where functions are aggregated with fewer levels of competence and where the same professionals cumulate many functions and have more chances of interacting routinely. These considerations will also be taken into account in the selection phase.

For this reason enrolment criteria are designed to select three countries with reported experience in intersectoral integrated surveillance, that reflect the demographic, geographical and governmental diversity of the Mediterranean and Black Sea Region (Box 1).

The success of the MeSA study will depend also on the commitment of the MediLabSecure PH Focal Points of participating countries. In fact, these Focal Points will be charged of organizing the site visits in their Ministry of Health and in other relevant Ministries and Institutions, of planning all internal travel and of organizing meetings with the most appropriate actors and informants. For this reason, we drafted terms of reference (Annex1) that were discussed in a dedicated side meeting of Mid Term project meeting.

This allow countries through the PH Focal Points to be aware of the amount of work required before deciding whether or not to agree to participate in the study.

Candidate countries will be identified for each group based on their relevant national know-how. The selection process will be aimed at identifying a rose of candidate countries with experiences and lessons learned that, if shared, could be useful to network participants in strengthening integration of surveillance in the framework of One Health.
Based on the objectives of the MeSA study pre-selection criteria were identified (Box 1).

**BOX 1: NATIONAL SITUATION ANALYSIS PRE SELECTION CRITERIA FOR COUNTRY PARTICIPATION**

- The three countries should reflect the diversity Region (i.e. large/small countries, centralized/decentralized countries, countries of Balkans/Middle East & North Africa/Black Sea)
- The level of integration of surveillance in the selected country is known to be high (according to the survey)
- The PH Focal Point considers the sharing of lessons learned and experiences matured nationally to be useful for the network
- There is internal national capacity to meet the study’s terms of reference requirements

During the Mid Term MediLabSecure project meeting, the WP5 held a side meeting in which the MeSA study objectives, process and selection criteria were discussed with members of the PH network of the project.

On the basis of the background knowledge gathered through the survey, initial expressions of interest are being collected from candidate countries. Countries expressing interest were further contacted and invited to participate in the study.

With the objective of providing the investigators in advance of each site visit with a document containing key information on the country that would be visited and tools to guide discussions, a country specific portfolio will be assembled. This will include details on the visit duration, aims and agenda as well as a stakeholder table and checklist for each environment to be visited. The national SWOT analysis performed during the exercise on West Nile Virus risk assessment held during the MediLabSecure mid-term meeting will also be used to enrich the country portfolio (see 2.2).

All the investigators involved in the MeSA study will discuss and jointly develop the study tools. These will include:

1. a stakeholder table, and
2. a comprehensive checklist

4.1 IDENTIFICATION OF IN-COUNTRY PARTICIPANTS TO INVOLVE IN THE STUDY AND DEVELOPMENT OF STAKEHOLDER TABLES

Each Participating Country’s Public Health Focal Point will be in charge of identifying and involving concerned actors and informants that could provide information and insights on the processes, procedures and performance of integration of laboratory/clinical human, animal and entomological surveillance of arboviruses in his/her country.

To aid this process, stakeholder tables will be developed in agreement with all the investigators, one for each sector studied.

All participating countries will be asked to involve, among others, the following informants:

- At least one actor in charge of the chosen disease surveillance in each sector to be visited as appropriate (e.g. human virology laboratory, animal virology laboratory, human public health, veterinary public health, entomological surveillance),
- Relevant national, intermediate and/or local level operators of the surveillance system of the chosen disease.

4.2 THE SITUATION ANALYSIS CHECKLIST

A semi structured check list will be developed to guide interviews with actors and informants during the site visit.

This tool will be developed by the investigators in advance and circulated ahead of the site-visit to informants to enable them to understand better the scope of the study and the type of information that would be requested.

The aim of the checklist is to provide a guide to follow in analysing the procedures and processes in place for integration/coordination of laboratory/clinical human, animal and entomological surveillance of arboviruses.
The checklist will be developed in English. In countries where English is not a used language, Public Health Focal Points will be in charge of explaining and, if needed, translating the checklist in advance of the visit to facilitate the work of the investigators.

The checklist might be structured in two separate sections directed specifically either to national actors involved in surveillance or to intermediate/local administrative levels (if appropriate).

5. MeSA phase 3: Site visits

The MediLabSecure project foresees site visits of the MeSA study to take place between July and December 2016. Selected participating countries will be asked to define, at their earliest convenience, the week in which to plan the situation analysis.

During each visit, the members of the MeSA study investigation team will be asked to:

- Visit the office in charge of national human surveillance of the selected arbovirus (MoH, central level) meeting with key informants and conduct a briefing,
- Visit the office in charge of national human laboratory, veterinary Public Health and lab, and entomological surveillance, as appropriate, of the arbovirus (central level) meeting with key informants,
- Visit, if possible, key informants across sectors in charge of the surveillance of the selected arbovirus at intermediate/local administrative levels,
- Discuss a real life events with key informants in each sector to explore the procedures, processes and performance of two way communication between laboratory/veterinary/entomological sectors and the NHS on aspects related to the surveillance of the selected arbovirus,
- Conduct a debriefing meeting with all the stakeholders involved to discuss and consolidate the information, data, procedures, lessons learned etc., collected through the documentation provided and through the interviews conducted during the visit.

The country portfolio and the checklist will be used to guide discussions.

The Public Health Focal Point of each participating country will be in charge of organizing the site visits in the Ministry of Health and in all relevant Sectors, of planning all internal travel and of organizing meetings with the most appropriate actors and informants.
6. Reporting

After each site visit a country report will be developed in collaboration with all the investigators involved.

The surveillance processes and their inter and intra sectoral connections will be mapped with the support of OrgLab (University of Cassino), using the Business Process Modelling Notation (BPMN) methodology, and customized colour coding for each sector.

Business Process Modeling (BPM) is a representational framework designed to visually “describe how businesses conduct their operations” and typically involve “graphical depictions of at least the activities, events/states, and control flow logic that constitute a business process” (Curtis et al., 1992). A process is defined as a set of activities executed in a predefined, sequential or parallel, order by a pre-determined number of organizational actors or entities sharing the collective goal of reaching organizational objectives (Chinosi and Trombetta, 2012). The term “business process modeling” and its related representation methodologies are not necessarily limited to the business environment but can be used in any scenario in which organizations are structured in a complex net of tasks and their interactions. In fact, BPM was developed for those processes that are so complex and distributed (as in the case of infectious diseases identification, early warning and response), that require a standardized and refined representation system to be effectively transmitted and clearly understood by a broad variety of individuals and units. BPM methods have been increasingly in vogue among analysts and organizational specialists, used both to create AS-IS representations of current practices, aiming at knowledge transfer, as well as to serve as an analytical tool to improve the efficiency or effectiveness of the analysed processes (TO-BE).

After a revision phase, the report will be shared with the MediLabSecure Coordination Team and cleared for publication in the MediLabSecure Website.

All the activities performed by WP5, including the results of the MeSA Study, will be the knowledge basis upon which this team will elaborate a “Strategic Document” that will analyse findings from a Mediterranean and Black Sea regional perspective.

7. References


5. Maria Grazia DENTE, Flavia RICCARDO, Jean-Claude MANUGUERRA, Camille ESCADAFA, Miguel Angel JIMENEZ-CLAVERO, Elisa PEREZ RAMIREZ, Vincent ROBERT, Marie PICARD, Lobna GAAYEB, Kathleen VICTOIR, Silvia DECLICH on behalf of the MediLabSecure Network Strengthening preparedness to arbovirus infections in Mediterranean and Back Sea Countries: towards common criteria to assess and report on One Health strategy. Abstract accepted at the MEdiPIET Annual Scientific Conference 2016

http://www.simetweb.eu/Page/WebObjects/PageSimet.woa/wa/displayPage?name=Pubblicazioni
Annex II
MediLabSecure Situation Analysis on integrated surveillance (MeSA) Study

SITE VISIT TO

GEORGIA

(12-16 December 2016)
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Confirmed Co-Investigators participating in the site visit

- **Istituto Superiore di Sanità**: Maria Grazia Dente and Flavia Riccardo
- **NCDC**: Khatuna Zakhashvili, Irine Kalandadze, Giorgi Chakhunashvili, Giorgi Babuadze, Nana Mamuchishvili
- **NFA**: Lasha Avaliani, Lena Ninidze, Natia Kartskhia
- **LMA**: Ana Gulbani, Maka Kochreidze
- **Università di Cassino**: Francesco Bolici

**Programme**

12 December: Arrival of ISS team in Georgia

13 December: Meeting at the NCDC, public health and disease surveillance in humans

14 December: NCDC’s laboratory at the R. Lugar Center and animal laboratory at the LMA, human virology and vector control-related issues;

15 December: Meeting with NFA, animal surveillance. Final debriefing meeting.

16 December: Departure of ISS team from Georgia

**Background Information**

**The Georgian Health System and CCHF Surveillance**

Is the health system in Georgia centralized or de-centralized?
What are the main administrative levels of the health care system? Could you please include an organigram of the relevant actors?

1. **HUMAN CCHF SURVEILLANCE**

- **When CCHF was first detected in Georgia?**
  
  In 2009

- **Is CCHF disease a notifiable disease in Georgia? (please mention relevant legal references and currently used case definitions)**
  
  Yes, we use national case definition.

- **How and where is laboratory confirmation of human cases of CCHF conducted?**
  
  By PCR and ELISA in Lugar Centre at NCDC

- **Who has responsibility for human CCHF surveillance and who for response in case of outbreaks?**
  
  NCDC, Communicable Disease Division

- **Could you please describe the CCHF surveillance system?**
• How many staff are involved in collecting and transmitting CCHF surveillance data?
  At central level (from NCDC) – 5 person, one epidemiologist from each PHC (62 PHC in Georgia)
• What are the data sources?
  Electronic Integrated Disease Surveillance System (EIDSS)
• How are the data collected (forms, number of variables, individual and/or aggregated, paper and/or electronic)? Individual Electronic forms.
• How is data analysis conducted? By EIDSS
• How are data transmitted out. To whom, in what format? Electronic, by EIDSS.
• Was the CCHF surveillance system evaluated? No
  o If so, Is it possible to share a copy of this evaluation with the investigator team?
• Is data shared with other sectors (animal health entomology)? For what purpose (early warning, surveillance ...). Yes, in One Health framework.
• Is feedback received from other sectors? In what format: Informal communication, regular official reports, Other (specify). Informal communication
• Can official documents pertaining human CCHF surveillance procedures be made available to the team during the site visit? Yes.

2. ANIMAL VIROLOGY AND VETERINARY PUBLIC HEALTH

What institution is in charge for animal virology and veterinary public health?

NFA (National Food Agency) is responsible for veterinary public health and LMA (Laboratory of the Ministry of Agriculture) – for animal virology.

• Is a veterinary surveillance system in place for CCHFV?
  There is no veterinary surveillance for CCHF in Georgia.
• Could you please describe the veterinary CCHFV surveillance system? (target species, active/passive surveillance etc.)
• How many staff are involved in collecting and transmitting CCHFV surveillance data?
• What are the data sources?
• How are the data collected (forms, number of variables, individual and/or aggregated, paper and/or electronic ...)?
• How is data analysis conducted?

• How are data transmitted out. To whom, in what format?

• Was the veterinary CCHFV surveillance system evaluated?
  o YES or NO
  o If so, is it possible to share a copy of this evaluation with the investigator team?

• Is data shared with other sectors (human health/entomology)? For what purpose (early warning, surveillance ...)

• Is feedback received from other sectors? In what format: Informal communication, regular official reports, Other (specify)

• Can official documents pertaining veterinary CCHFV surveillance procedures be made available to the team during the site visit?

3. MEDICAL ENTOMOLOGY

What institution is in charge for medical entomology? NCDC

• Could you please describe the entomological CCHFV surveillance system? (target species, active/passive surveillance etc.)

  Active

• How many staff is involved in collecting, identifying tick pools?

  4 person

• Do you have maps of distribution of potential CCHFV vectors in your country?

  Yes

• Do you monitor PCR CCHFV positivity in tick pools?

  Yes

• How are the data collected? By paper record

• How are data transmitted out? To whom, in what format?

  Collected data are kept in common data base as Excel format.

• Is data shared with other sectors (human health/animal health)? For what purpose (early warning, surveillance ...)

  Data are shared with NCDC laboratory and epidemiologists
• Is feedback received from other sectors? In what format: informal communication, regular official reports, Other (specify) N/A

Please go to our webpage: www.ncdc.ge and see the structure of our institution.

• Can official documents pertaining entomological CCHFV surveillance procedures be made available to the team during the site visit?
  Yes

4. POLICY/INSTITUTIONAL LEVEL INTERSECTORAL AGREEMENTS

Are there formal collaboration mechanisms between the animal virology and veterinary public health and the human sector (ministerial decree, legislation or other formal documents) that impact CCHFV surveillance?

Decree of the government of Georgia "Infectious diseases, including the especially dangerous pathogens diseases, integrated national surveillance system for approval of the rules of operation".

Are there formal collaboration mechanisms between the medical entomology sector and the human sector (ministerial decree, legislation or other formal documents) that impact CCHFV surveillance?

Medical entomology sector is a part of NCDC.

Are there Memorandum of understandings or other formal agreements between the institutions involved in CCHFV surveillance from the human, animal and entomological sectors?

Decree of the government.

Are there informal agreements of collaboration between the mentioned institutions?

No.

5. INTERSECTORAL COLLABORATION AT DATA COLLECTION/ANALYSIS LEVEL

Is there interoperability between data collection mechanisms of human surveillance, animal surveillance and medical entomology monitoring for CCHFV?

Electronic Integrated Disease Surveillance System (EIDSS) database and reporting system was launched in Georgia, that supports monitoring and prevention of diseases within One Health concept by integrating veterinary, human and vector surveillance.

Is there interoperability between data analysis mechanisms of human surveillance, animal surveillance and medical entomology monitoring for CCHFV?

EIDSS supports data analysis.

Is regular exchange of information occurring across sectors involved in CCHFV surveillance regardless of full interoperability of the data collection and analysis systems?

Yes.
6. INTERSECTORAL COLLABORATION AT DATA DISSEMINATION LEVEL

Are CCHFV joint surveillance reports issued that include data on human surveillance, animal surveillance and medical entomology monitoring?

There are joint on human surveillance and medical entomology monitoring

Is there a two way communication in place between public health and other sectors involved in CCHFV surveillance?

Yes.

7. CONCRETE EXAMPLES

When were CCHFV outbreaks described in Georgia?

Could these real life experiences be used to describe the intersectoral collaboration mechanisms in place during the site visit?

If so, we would kindly ask you to describe the outbreaks and provide any publication you deem relevant in allowing the investigators to prepare in advance of the visit on the topic.

NCDC and local PHC epidemiologists conduct a case study to establish the risk factors, contacts, infection ways. Then entomologists collect ticks and rodents from the place of exposure. NCDC send the official request to NFA for control measures and NFA uses acaricides against ticks in domestic animals and farmhouses.

DEBRIEFING MEETING WITH ALL THE STAKEHOLDERS INVOLVED

The site visit will involve all sectors responsible for CCHFV surveillance.

The information, data, procedures, lessons learned etc., collected through the documentation provided and through the interviews conducted during the visit with all the stakeholders involved, will be discussed and consolidated during a meeting to be organized in the last day with all the stakeholders.

Stakeholders table (as per Institution to be visited) – add please rows as needed

| National Center for Disease Control and Public Health of Georgia (NCDC) - http://www.ncdc.ge/ |
| Laboratory of Lugar Center of NCDC (virology and entomology department)- http://www.ncdc.ge/en-US/LaboratoryNetworksAndBS |
CHECKLIST

It will be drafted by ISS with the aim of facilitating the interviews and the meetings to note, share and discuss relevant aspects of the surveillance system in place in the Country.
MedilabSecure

WP5 - Public Health

The MediLabSecure Situation analysis on integrated surveillance of arboviruses in the Mediterranean and Black Sea Region (MeSA Study)

Check List for the site visit

6 December 2016
Figure 2 Health care system structure in Georgia by 2009. Adapted from Chanturidze et al. [2] and Kordzaia [21].
Checklist’s Rationale:

- Consistency with the objectives of the Study (see study design)
- Consistency with the approaches and criteria adopted during the implementation of WP5 (including the Lit Review and Survey)
- Present Focus: Crimean Congo Hemorrhagic Fever (CCHF) and Crimean Congo Hemorrhagic Fever Virus (CCHFV)
- The same checklist for all the sectors (human virology, animal virology, entomology, human public health) involved

- Filled in during the meeting with: ____________________________________________
- Medilabsecure contact point: YES       NO
- Sector: ________________________________________________________________
- Institution: ___________________________________________________________
- Country: _____________________________________________________________
- ________________________________________________________________

1. Level of integration: Policy and Institutional

i. **Is the Aim of CCHF/V integrated** surveillance in your Country stated somewhere? :

   YES       NO

   a. If **YES**: stated where?

ii. **Is a National multisectoral steering committee** in place for the surveillance of arboviruses and/or for CCHF in particular?

   YES       NO

   a. If **YES**
      i. **Role:** ____________________________________________________________
ii. Members: ________________________________

iii. Frequency of ordinary meetings: ______________________

iv. Reasons for extraordinary meetings: ______________________

v. Ways of communication between members: ______________________

vi. ………………………………………………………………..

iii. Is a *National coordinating multisectoral unit* in place for the surveillance of arboviruses and/or for CCHF in particular?

YES        NO

a. If YES
i. Role: ________________________________

ii. Members: ________________________________

iii. Frequency of ordinary meetings: ______________________

iv. Reasons for extraordinary meetings: ______________________

v. Ways of communication between members: ______________________

vi. ………………………………………………………………..

iv. Is there a *coordinated plan for distribution of human resources* dedicated to surveillance among the different sectors? YES        NO

v. Is a plan for CCHF Integrated/multisectoral surveillance available?

YES        NO

If YES, is it prepared on annual basis? YES        NO

If YES, is the 2016 plan available? (to be provided if available) YES        NO

vi. Are *types and targets* of surveillance identified in the plan? YES        NO

vii. Are Endemic and not-endemic areas identified? YES        NO
2. Level of integration: Data collection and analysis

Human surveillance

Starting of the CCHF surveillance in the Country: 2009

If YES:

- Seasonal
- Permanent

- Is the surveillance in accordance with Endemic and not-endemic areas?
  YES
  NO

- If YES, specify

Who is in charge for the surveillance (institution, Dept. etc): ________________________________

Who does the analysis (institution, Dept. etc): ________________________________

to whom are the confirmed cases reported (institution/s, Dept/s. etc): ___________________________

timing: ____________________________________________________________________________

way/s: ______________________________________________________________________________

- Studies? YES NO

If YES,

Type of studies and references

_______________________________________________________________________________________

_______________________________________________________________________________________
Animal surveillance

CCHF surveillance in animals  YES  NO

If YES:

  ○ Seasonal
  ○ Permanent

- Is the surveillance in accordance with Endemic and not-endemic areas?
  YES  NO

- If YES, specify

Who is in charge for the surveillance (institution, Dept. etc): ________________________________

who does the analysis (institution, Dept. etc): ________________________________

to whom are the confirmed cases reported (institution/s, Dept/s. etc): _______________________

timing: __________________________________________________________

way/s: ______________________________________________________________

- Studies?  YES  NO

If YES,

Type of studies and references

__________________________________________________________________________________

__________________________________________________________________________________
Entomological Surveillance

CCHFV in ticks  

YES  NO

If YES:
  ○ Seasonal
  ○ Permanent

- Is the surveillance in accordance with Endemic and not-endemic areas?
  YES  NO

- If YES, specify

Who is in charge for the surveillance (institution, Dept. etc): _________________________________

who does the analysis (institution, Dept. etc): _____________________________________________

to whom are the confirmed cases reported (institution/s, Dept/s. etc): ____________________

timing: ________________________________________________________________________________

way/s: _________________________________________________________________________________

- Studies?  YES  NO

If YES,

Type of studies and references

_____________________________________________________________________________________

_____________________________________________________________________________________
- Early Warning – Risk Assessment-Response-Communication

Is there any early warning system, which activates human health measures based on animal and/or entomological surveillance?  

YES      NO

If YES, can you describe your role (organizer, participant, etc.) in the process as per the table below? Is the procedure formally developed and available?  YES      NO

<table>
<thead>
<tr>
<th>Steps of the Process</th>
<th>EW</th>
<th>Risk assessment</th>
<th>Response/Public Health Actions</th>
<th>Risk Communication</th>
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</thead>
<tbody>
<tr>
<td>How does the process start? or What event triggers the process to start?</td>
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<tr>
<td>You provide info to (Institution/s; Dept/s)</td>
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<td>Type of info</td>
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<td>how soon/periodicity</td>
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<td>Info are provided to you by (Institution/s; Dept/s)</td>
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<td>how soon/periodicity</td>
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<tr>
<td>Multisectorial meetings (periodicity)</td>
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<tr>
<td>report exchange (periodicity)</td>
<td></td>
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</tr>
</tbody>
</table>

- Please describe the most recent early warning case and provide available documents
**USE of data for PUBLIC HEALTH ACTIONS**

Is a national database available for surveillance data?  
YES    NO

If YES, is this database including all the surveillance data (animal, entomological, human)?  
YES    NO

If NO, which kind of database are available?  
YES    NO

Are they accessible to other sectors involved in the surveillance?  
YES    NO

If YES,

- specify the sector/s: ____________________________________________

- type of access: □ consultation □ data management □ __________________

**3. Level of integration: Dissemination**

Is a communication dept. /officer available?  
YES    NO

If YES, is this connected/coordinated with the other relevant sectors?  
YES    NO

Is a National bulletin/newsletter jointly prepared by all the relevant sectors available?  
YES    NO

If YES:

  Frequency: ____________________________________________

  Target/s: ____________________________________________

Is a dedicated website jointly managed by all the relevant sectors available?  
YES    NO

Is the Evaluation of the integrated WNV plan performed?  
YES    NO

If YES, is this available?  
YES    NO
Consulted Documents:

- WHO Georgia country profile
- Tamari Rukhadze An overview of the health care system in Georgia: expert recommendations in the context of predictive, preventive and personalised medicine The EPMA Journal 2013, 4:8
- http://www.epmajournal.com/content/4/1/8
- Ashley L. Greiner, MD1,2, Nana Mamuchishvili3, Stephanie J. Salyer2, DVM, Kendra Stauffer4, DVM, Marika Geleishvili, MD4, Khatuna Zakhashvili, MD3, Juliette Morgan, MD4 Increase in Reported Crimean-Congo Hemorrhagic Fever Cases — Country of Georgia, 2014 MMWR / March 6, 2015 / Vol. 64 / No. 8 http://www.cdc.gov/mmwr/pdf/wk/mm6408.pdf
Annex III
<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Institution</th>
<th>Position</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Paata Imnadze</td>
<td>NCDC</td>
<td>Research Director</td>
<td><a href="mailto:pimnadze@ncdc.ge">pimnadze@ncdc.ge</a></td>
</tr>
<tr>
<td>2.</td>
<td>Irine Kalandadze</td>
<td>NCDC</td>
<td>Communicable Disease Division, Epidemiologist</td>
<td><a href="mailto:Irinekal7@yahoo.com">Irinekal7@yahoo.com</a></td>
</tr>
<tr>
<td>3.</td>
<td>Khatuna Zakhashvili</td>
<td>NCDC</td>
<td>Head of Communicable Disease Division</td>
<td><a href="mailto:episurv@ncdc.ge">episurv@ncdc.ge</a></td>
</tr>
<tr>
<td>4.</td>
<td>Nana Mamuchishvili</td>
<td>NCDC</td>
<td>Communicable Disease Division, Epidemiologist</td>
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</tr>
<tr>
<td>5.</td>
<td>Giorgi Chakhunashvili</td>
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<td><a href="mailto:gio.ncdc@gmail.com">gio.ncdc@gmail.com</a></td>
</tr>
<tr>
<td>6.</td>
<td>Archil Navdarashvili</td>
<td>NCDC</td>
<td>Communicable Disease Division, Epidemiologist</td>
<td><a href="mailto:a.navdarashvili@gmail.com">a.navdarashvili@gmail.com</a></td>
</tr>
<tr>
<td>7.</td>
<td>Ekaterine Adeishvili</td>
<td>NCDC</td>
<td>Head of Lugar center for Public Health Research</td>
<td><a href="mailto:e.adeishvili@ncdc.ge">e.adeishvili@ncdc.ge</a></td>
</tr>
<tr>
<td>8.</td>
<td>Gvanca Chanturia</td>
<td>NCDC</td>
<td>Lugar center for Public Health Research, head of Virology and Molecular Biology Division</td>
<td><a href="mailto:romail28@gmail.com">romail28@gmail.com</a></td>
</tr>
<tr>
<td>9.</td>
<td>Giorgi Babuadze</td>
<td>NCDC</td>
<td>Lugar center for Public Health Research, Virology and Molecular Biology Division</td>
<td><a href="mailto:gbabuadze@ncdc.ge">gbabuadze@ncdc.ge</a></td>
</tr>
<tr>
<td>10.</td>
<td>Nikoloz Tsertsvadze</td>
<td>NCDC</td>
<td>Lugar center for Public Health Research, Medical Zoo- Entomology Division</td>
<td><a href="mailto:nikoncdc@mail.ru">nikoncdc@mail.ru</a></td>
</tr>
<tr>
<td>11.</td>
<td>Marina Donduashvili</td>
<td>LMA</td>
<td>Head of laboratory</td>
<td><a href="mailto:marina.donduashvili@lma.gov.ge">marina.donduashvili@lma.gov.ge</a></td>
</tr>
<tr>
<td>12.</td>
<td>Maka Kokhreidze</td>
<td>LMA</td>
<td>Laboratory staff</td>
<td><a href="mailto:maka.kokhreidze@lma.gov.ge">maka.kokhreidze@lma.gov.ge</a></td>
</tr>
<tr>
<td></td>
<td>Name</td>
<td>Agency</td>
<td>Position</td>
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</tr>
<tr>
<td>13.</td>
<td>Anna Kekelidze</td>
<td>LMA</td>
<td>Biosafety officer</td>
<td><a href="mailto:Ana.kekelidze@lma.gov.ge">Ana.kekelidze@lma.gov.ge</a></td>
</tr>
<tr>
<td>14.</td>
<td>Lasha Avaliani</td>
<td>NFA</td>
<td>Head of Veterinary Department</td>
<td><a href="mailto:lasha.avaliani@nfa.gov.ge">lasha.avaliani@nfa.gov.ge</a></td>
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<tr>
<td>15.</td>
<td>Lena Ninidze</td>
<td>NFA</td>
<td>Veterinary Department, Epidemiologist</td>
<td><a href="mailto:lena.nindze@nfa.gov.ge">lena.nindze@nfa.gov.ge</a></td>
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<tr>
<td>16.</td>
<td>Natia Kartskhia</td>
<td>NFA</td>
<td>Veterinary Department, Epidemiologist</td>
<td><a href="mailto:Natia.kartskhia@nfa.gov.ge">Natia.kartskhia@nfa.gov.ge</a></td>
</tr>
</tbody>
</table>
Epidemiology of Crimean-Congo Hemorrhagic Fever in Georgia

Nana Mamuchishvili MD., PhD.

Genus - Nairovirus
Family - Bunyaviridae
## Cases and mortality rate of CCHF by age group

2009-1; 2012-1; 2013-13; total 54 cases.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2016 1-11 month</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Cases</td>
<td>Cases</td>
</tr>
<tr>
<td></td>
<td>Mortality rate (%)</td>
<td>Mortality rate %</td>
<td>Mortality rate %</td>
</tr>
<tr>
<td>1-4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>15-19</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>20-29</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>30-39</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>40-49</td>
<td>1</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>50-59</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>60-69</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>70&lt;</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>6</strong></td>
<td><strong>9</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>

National Center for Disease Control & Public Health

www.ncdc.ge
Incidence CCHF in Georgia by Region
2012-2015

Incidence Rate per 100 000, NCDC of Georgia
Incidence of Crimean-Congo hemorrhagic fever in Georgia by Region

Source: NCDC of Georgia 2014 (GIS)
Seasonality of CCHF
2012–2015

National Center for Disease Control & Public Health

www.ncdc.ge
Insidence of CCHF by age group

2012–2015
CCHF by Gender
2012–2015

40%

60%

male
female
CCHF - Risk factors
2009 – 2015

- Tick bite
- Exposure of tick
- Contact biological fluids of animal

43%
9%
48%
Incidence of CCHF by years
01.01.2012-01.10.2016

National Center for Disease Control & Public Health
www.ncdc.ge
Surveillance of CCHF with contact persons

- The total number of contact persons – 395
  - family member – 244
  - Neighbor – 33
  - Medical workers – 118

- For the first time in Georgia, a case of nosocomial transmission of CCHF at a hospital was described in July 2016.
  - 2 people were positive from a contact person
  - Recorded 2 outbreak by 2 cases in Oshora (Aspindza) and in Dviri (Borjomi)
Laboratory diagnostic of CCHF

- **virus isolation**
  - 2-5 day
  - The test has a low sensitivity (high viremia only fixes)

- **Viral RNA sequence real time polymerase chain reaction (RT-PCR)**
  - Specific, sensitive, fast, 1-7 day

- **Viral antigen detection**

- **Detection of antibody (IgG and IgM) by ELISA**
  
  *From 5th to 7th day of Onset of symptoms of the disease
  
  **IgM (7 days to 4 months) and IgG (7 days to 5 years)**

- **Immunohistochemical staining**

- **serum neutralization**;
CCHF - Georgia
Crimean-Congo haemorrhagic fever Clinical signs *(EIDSS)*

<table>
<thead>
<tr>
<th>Symptoms (WHO)</th>
<th>%</th>
<th>Symptoms Georgia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>43-85</td>
<td>Fever</td>
<td>86</td>
</tr>
<tr>
<td>Bleeding</td>
<td>29-48</td>
<td>Bleeding</td>
<td>50</td>
</tr>
<tr>
<td>Hepatomegaly</td>
<td>30-43</td>
<td>Haemorrhages</td>
<td>43</td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td>13-40</td>
<td>Petechiae and ecchymosis</td>
<td>36</td>
</tr>
<tr>
<td>Macula-papular rash</td>
<td>29-57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petechiae and ecchymosis</td>
<td>30-46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lung damage</td>
<td>4-28</td>
<td>Petechiae and ecchymosis</td>
<td></td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>14-23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peritoneal irritation</td>
<td>11-50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>1-11</td>
<td>Thrombocytopenia</td>
<td>93</td>
</tr>
<tr>
<td>Heart damage</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck stiffness</td>
<td>1-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaundice</td>
<td>99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Monitoring of CCHF

- Contact with the biological fluids, monitoring for 14 days of last contact, by measuring the temperature twice a day

- If a person develops a temperature of $38^\circ C$ or more, headache and muscle pain, be considered possible cases

$\rightarrow$ Hospitalization and Ribavirin
Thank you for your attention!
National Center for Disease Control and Public Health

Amiran Gamkrelidze
NCDC

is a central public health and research institution under the authority of MoLHSA

Established in 1995 on the basis of CDC / Atlanta

Structure

1937 Establishment of the Anti-Plague Station in Georgia

1992 Research Center of Especially Dangerous Pathogens (EDPs)

1995 National Center for Disease Control

2004-2007 As a result of large-scale reorganization: Integration of Medical Statistics Center and Public Health Department into the NCDC

2013 Integration of R. Lugar Center for Public Health Research (CPHR) into the NCDC
Multisectoral Supervisory Board: MoLHSA, MoA, MoES, MIA, MoD, MoE, MoF

NCDC
(High-level Biomedical Research Center - Center of Excellence)

Lab Part
Richard G. Lugar Center
“One World – One Health”

Non-Lab/Office
Part of NCDC&PH

Immunization
Cold Chain Infrastructure
Vision: Our Knowledge – for Public Health

Mission: Protection and improvement of the health of Georgia’s population through scientific evidence-based prevention of diseases, preparing for and timely responding to threats of public health
Strategic Priorities

- Decrease of Morbidity, Disability and Mortality caused by Communicable Diseases
- Decrease of Morbidity, Disability and Mortality caused by Non-Communicable Diseases
- Assessment and correction of environmental hazards and behavioral risk-factors for improvement of health in population
- Development of applied and fundamental bio-medical and bio-technological scientific research potential
Laboratory Part of NCDC - Lugar Center

- Genomic Center
- Repository of EDP
- Bacteriology
- Serology
- Molecular Biology
- Virology
- Parasitology
- Cell Cultures
- Entomology
- Vivarium
- CDC/GDD Lab
- WRAIR Lab
- BSL3 designated area for LMA & MES

3 Zonal Diagnostic Laboratories - ZDLs
7 Local Surveillance Stations - LSSs
NCDC / Lugar Center is in a process of applying for the status of WHO Collaborating Center for Emerging Infections
Lab surveillance system based on “One World – One Health” approach
Non-Laboratory Part of NCDC

State Public Health Programs:
- Immunization
- Blood Safety
- TB
- HIV/AIDS
- Screening
- Surveillance
- MCH
- Occupational diseases

Epid-surveillance of Infectious Diseases:
- VPD
- Diarrheal
- Vector born
- Air born
- EDP - Zoonoses
- STI/HIV/TB

Surveillance of NCD:
- CVD
- Cancer
- Diabetes
- COPD
- Risk factors
- Health promotion
- Behavioral Health

Training Center

Environmental Health

Medical Statistics

National Center for Disease Control & Public Health
www.ncdc.ge
Universities & Research Centers:
University of Florida, University of Maryland, Emory University, Johns Hopkins University, Arizona University, Bundeswehr Institute of Microbiology, University of Oslo, etc.
Research Projects of Public Health Importance at NCDC

NCDC within USD 23 000 000 implemented more than 160 international projects and research grants in the field of public health, including:

- Malaria Prevention and Control;
- Surveillance and Response to Avian and Pandemic Influenza;
- Tularemia Epidemiology and Ecology in Georgia;
- Prevention of Amebiasis in Georgia;
- Enforcement of 100% Smoke-free Policy in Health Care Institution and Secondary Schools of Georgia;
- Reproductive Health Survey (2000, 2005, 2010);
- Non-communicable Diseases Risk - factors Survey (STEPS);
- US CDC / GDD:
  - a. South Caucasus Field Epidemiology and Laboratory Training Program (FELTP);
  - b. Acute Febrile Disease Surveillance;
  - c. Epidemiology and Control of Nosocomial Infections, etc.
Ongoing Research Projects at NCDC

- Project “Biological threat reduction integrating program”, DTRA
- Project GG-19 "Epidemiology and Ecology of Tularemia in Georgia", DTRA
- Project “Sustaining Influenza Surveillance Networks and Response to Seasonal and Pandemic Influenza by National Health Authorities outside the United States, CDC/Atlanta
- Project “Global Disease Detection – GDD”, CDC/Atlanta
- Project "A-multi-task investigation on the human immune response to anthrax aimed at developing more effect vaccines", NATOSFPP 984208
- Project "Field Epidemiology and Laboratory Training program (FELTP)", CDC/ATLANTA
- Project "Establishment of Regional Training and Resource Centre in Biosafety, Biosecurity and Laboratory Management in the South Caucasus“, B1&C4, EU/UNICRI
Ongoing Research Projects at NCDC

- Project "Enforcement of 100% smoke-free policy in healthcare institutions and secondary schools of Georgia", International Union of Tuberculosis and Lung Diseases, The Union-North America

- Project "Development of Surveillance System and Control Strategy for Leishmaniasis in Georgia by means of Epidemiological and Strengthening of Laboratory capacities“, ISTC/BTEP NIH / NIAID

- Project "Biology and control of vector-borne infections in Europe", FP7-HEALTH-2010-single-stage EDENext

- Project "Transmission of zoonotic influenza between humans, pigs and poultry", Florida State University, USA; University of Guelph, Canada; STCU

- Project "Epidemiology of Clostridium difficile-associated disease in Georgia", ISTC/BTEP

- Project "Tobacco Survey in Georgia", Emory University Rollins School of Public Health etc.
Upcoming Research Projects (already negotiated)

• Project GG-21  “Human Disease Epidemiology and Surveillance of Especially Dangerous Pathogens in Georgia“, DTRA CBEP

• Project GG-23  “Creation of Sustainable Immunodiagnostics“, DTRA

• Project  “Reducing the burden of tuberculosis in Georgia by sustaining universal access to quality diagnosis and treatment of all forms of tuberculosis including M/XDR-TB“, Global Fund

• Project  “Sustaining and scaling up the existing national responses for implementation of effective HIV/AIDS prevention activities, improving survival rates of people with advanced HIV infection by strengthening treatment and care interventions in Georgia“, Global Fund
Upcoming Research Projects (already negotiated)

- Project  “Reproductive-age Mortality Survey", John Snow Institute, USAID
- Project  “New and Under-Used Vaccine Introduction Grant - Pneumococcal (PCV10) vaccine”, GAVI
- Project  “Tobacco Survey in Georgia”, Emory University Rollins School of Public Health
- Project  “Establishment of a Southwest-Asian network for biosecurity and diagnosis of dangerous infectious diseases", Bundeswehr Institute of Microbiology, Munich, Germany
- Project  “Population-based Survey for Prevalence Hepatitis C Virus Infection in the Country of Georgia”
Thank you for your attention!
One-health concept Implementation and zoonosis control in Georgia

Irine Kalandadze,
K.Zakhashvili, A.Navdarashvili
NCDC

Tbilisi, Georgia, 2016
One Health is the collaborative effort of multiple disciplines – working locally, nationally and globally – to attain optimal health of humans, animals and our environment.
Zoonotic diseases control difficulties

- lack of intersectoral collaboration
- Gaps in control measures
- Increase of number of zoonosis cases and outbreaks
NCDC Initiative

Implementation of One Health concept

- Legislation
- One-health team set up
- Work jointly
- Process expanding and different services involving
One Health concept

Legislation:

- In 2010, the Ministry of Labor, Health and Social Affairs of Georgia (MoLHSA) and Ministry of Agriculture signed a joint order about the regulation of the information exchange between the detection of the disease.
- 2014 - A decree of the government of Georgia „On measurements to be implemented for prevention of rabies in 2014-2018“
- 2015 - A decree of the government "Infectious diseases, including the especially dangerous pathogens diseases, integrated national surveillance system for approval of the rules of operation"
One Health concept

Electronic Integrated Disease Surveillance System (EIDSS)

- Share information between MoA and MoH
- Provides veterinary, human and vector surveillance for each new case
One Health concept

In 2013 - One Health Team - National Animal Health Program Steering Group

- NFA
- LMA
- NCDC
- International agencies
One Health - Activities

➢ Since 2013 - **Anthrax** vaccination have been conducting by the NFA
  ✓ In 2014-2015, incidence of human and animal cases were reduced by 40%.

➢ 2014-2015 - Massive anti **Rabies** vaccination was conducted in domestic animals by the NFA
  ✓ After vaccination in dogs laboratory confirmed cases were reduced by 43.5%.
  ✓ For the first time since 1990, there were no human rabies cases in 2015-2016.
One Health- Activities

2013 - In Georgia was first identified a new genotype Orthopoxviruses - Akhmeta virus.

NCDC and the MoA will partner with CDC Poxvirus Team (U.S.) and CDC-Georgia in the development of a long term research project based on One Health concepts, to enhance capacity for case detection and diagnosis of febrile zoonotic-related cutaneous lesions in and to further characterize the new OPXV found in Georgia.
One Health- Activities

2014 – Brucellosis

- Active surveillance program was conducted by the NFA. The study revealed high prevalence of brucellosis in animals.

- NCDC carried out work in the most affected areas.
  - Blood was taken from patients with suspected Brucellosis,
  - Training was conducted for the primary healthcare doctors
  - Awareness raised in general population
One Health- Activities

The highest rate of CCHF was reported in 2014 in Georgia.

- In the same area where human cases were reported, NFA used acaricides against ticks in domestic animals and farmhouses.
- This action lead us to positive result and in 2015-2016 cases of CCHF were reduced.
2013-2015, an educational campaign was conducted, during which educational materials on zoonosis diseases were distributed among the population in Georgian, Armenian and Azerbaijani languages.
One Health- Activities

In 2014 – 2015, two one-health master classes were conducted for re-emerging diseases surveillance and response

- GIPA
- GRDD
- CDC Atlanta

- MoH
- NCDC
- MoA
- Ministry of Environment and Natural Resources Protection of Georgia
- LEPL Emergency Management Agency of MIA of Georgia
Recommendations/Problems

- Minimize the negative impacts from human-animal-environment interactions
- Address gaps in the capacities of countries to comply with tenets of good governance
- Strengthen work to implement OH concept at district and regional levels
- Strengthening Interco operation between the human-environment:
  - Zoonotic infections detection, including water and food transmitted.
  - Detection and reduction of pollution impact
Working with an OH approach is effective, provides results, saves time and is cost-effective.

One Health

Brings Us All Together

National Center for Disease Control & Public Health

www.ncdc.ge
Thank You for your attention

National Center for Disease Control & Public Health

www.ncdc.ge
Experiences in intersectorial surveillance integration

Flavia Riccardo and Maria Grazia Dente
Istituto Superiore di Sanità, Rome, Italy
Francesco Bolici
Cassino University, Italy

MeSA Study
Georgia
13-15 December 2016

Debriefing meeting, 15 December 2016
Outline

• Mesa Study in Georgia focussing on CCHF surveillance
  • timeline and process

• Main Preliminary Findings for discussion
  • Comments, suggestions, integrations and corrections

• Structure of the study report

• Next steps
Timeline

• First feedback on the experience of Georgia in intersectorial surveillance (MedilabSecure Survey 2014)
• Consultations during the MediLabSecure Mid Term Meeting (December 2015)
• Agreement to participate in the MediLabSecure MeSA Study (June 2016)
• Site Visit to Georgia (December 2016)
• Follow up activities (2017)
During three days we asked different actors involved in CCHF surveillance across the human, veterinary and entomological sectors:

**To Describe** how the collection, analysis and dissemination/exchange of information is organized within and between human, animal and entomological surveillance of arboviruses in three countries of the MediLabSecure network,

**To Highlight** the formal procedures, informal practices and legal constraints for integrated surveillance and inter-sectoral collaboration,

**To Discuss** main challenges and success stories in establishing a functional inter-sectoral collaboration and integration of surveillance between the human, animal and entomological sectors.
Agenda

- on 13th of December: meeting at the NCDC, public health and disease surveillance in humans;

- on 14th of December: NCDC's laboratory at the R. Lugar Center and animal laboratory at the LMA, human virology and vector control-related issues;

- on 15th of December: meeting with NFA, animal surveillance;

- on 15th of December: final debriefing meeting.
Methodology of provisional findings presentation and discussion

How will we proceed?

• Presentation of the general picture we have captured using **Business Process Modelling** methodology

• Collection of your comments, corrections and integrations in general and for each sector diagram as appropriate
### Intersectorial integration in the Georgian CCHF surveillance system

<table>
<thead>
<tr>
<th>Level of integration</th>
<th>Sublevels of integration</th>
<th>The Georgian example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy and institutional level</td>
<td>Policy level</td>
<td>Legislation issued by the Government (2015) has created the One Health intersectorial committee at national level (regional/local level?)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NCDC covers the Human Health and Entomology and refers to the Ministry of Health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Presence of formal institutional collaboration mechanisms within other sectors (as during the 2014 outbreak)</td>
</tr>
<tr>
<td>Institutional level</td>
<td>Presence of informal collaboration mechanisms (across sectors and within the human health sector)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Presence of a strategic plan developed after CCHF epidemic in 2014 which is presently being developed in a generic preparedness plan</td>
<td></td>
</tr>
<tr>
<td>Data collection and analysis level</td>
<td>Interoperability mechanisms at data collection level</td>
<td>EIDSS Electronic Integrated Disease Surveillance System across all sectors</td>
</tr>
<tr>
<td></td>
<td>Interoperability mechanisms at data analysis level</td>
<td>Potential with the EIDSS, but presently used across human epi and virology</td>
</tr>
<tr>
<td>Dissemination level</td>
<td></td>
<td>Information and reports are shared across sectors during the One Health Meetings every 3 months</td>
</tr>
</tbody>
</table>
Lessons learned

• One Health Committee operatively discuss priorities (Anthrax, Brucellosis, CCHF and Rabies) and emerging priorities (e.g. Antimicrobial resistance)

• CCHF Strategic Plan helps the development of Generic Preparedness Plan

• The Georgian context is conducive for intersectoral collaboration (small country, all the stakeholders can be informally in contact, high motivation)

• As CCHF is a human problem, the human health sector is the main driver for the actions

• EIDSS is a tremendous tool that is being used across sectors (repository of data, data analysis, source of updated information accessible across sectors)

• Additional potentialities of the EIDSS could be developed:
  • Early Warning function could be strengthened
  • Entomological sector described as rudimental
  • Integrated analysis of the data collected with the system across sectors
  • Use of the system to encourage integrated dissemination?
Presumptive structure of the study report

• introduction on the organization of the Georgian surveillance system
• Introduction on the history of CCHF transmission in Georgia and evolution of the surveillance systems and their integration
• Analysis of surveillance and response processes (intra/inter sectorial) possibly using Business process modelling
• Conclusions
• Annexes: portfolio, checklists, list of interviewed actors.
Next Steps

• Draft study report (to be tentatively sent for your feedback first months of 2017)

• Finalization of the report

• Use of the findings (survey, scoping review, 3 MeSA Studies) to formulate a Strategic Document (2017)
Thank you for your warm welcome to your beautiful country, for the knowledge you shared with us and for all the patience you had with all of our questions!