



National Center for Disease Control and Public Health of Georgia

ANNUAL REPORT 2016

(Short version)

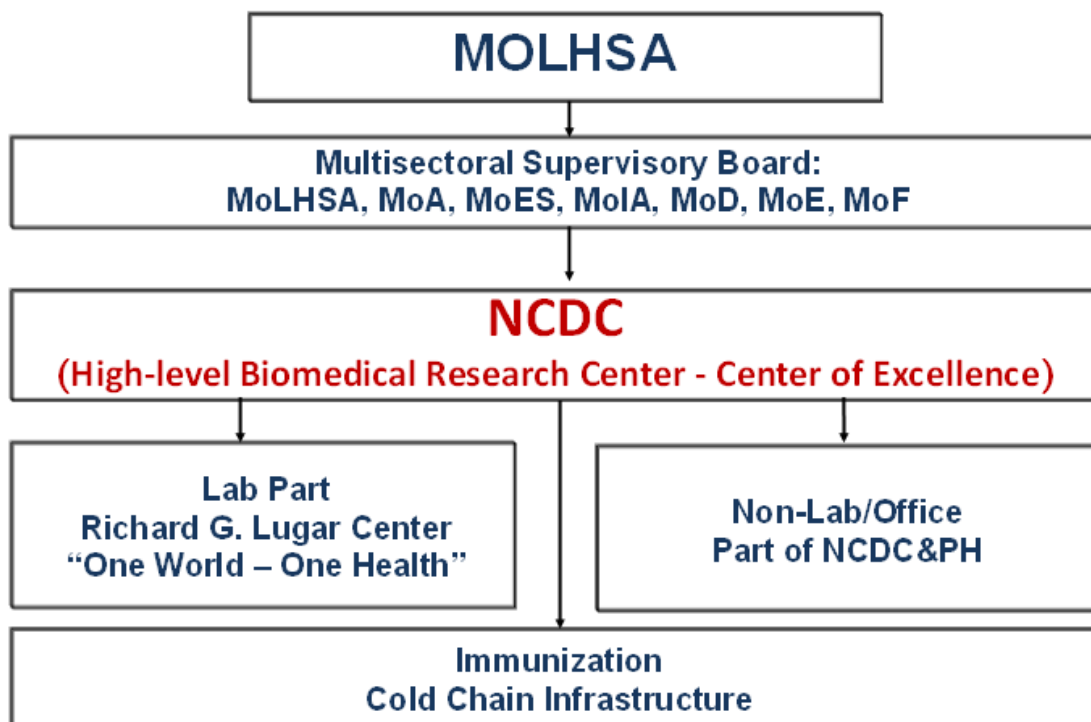
**Tbilisi
2017**

Preface

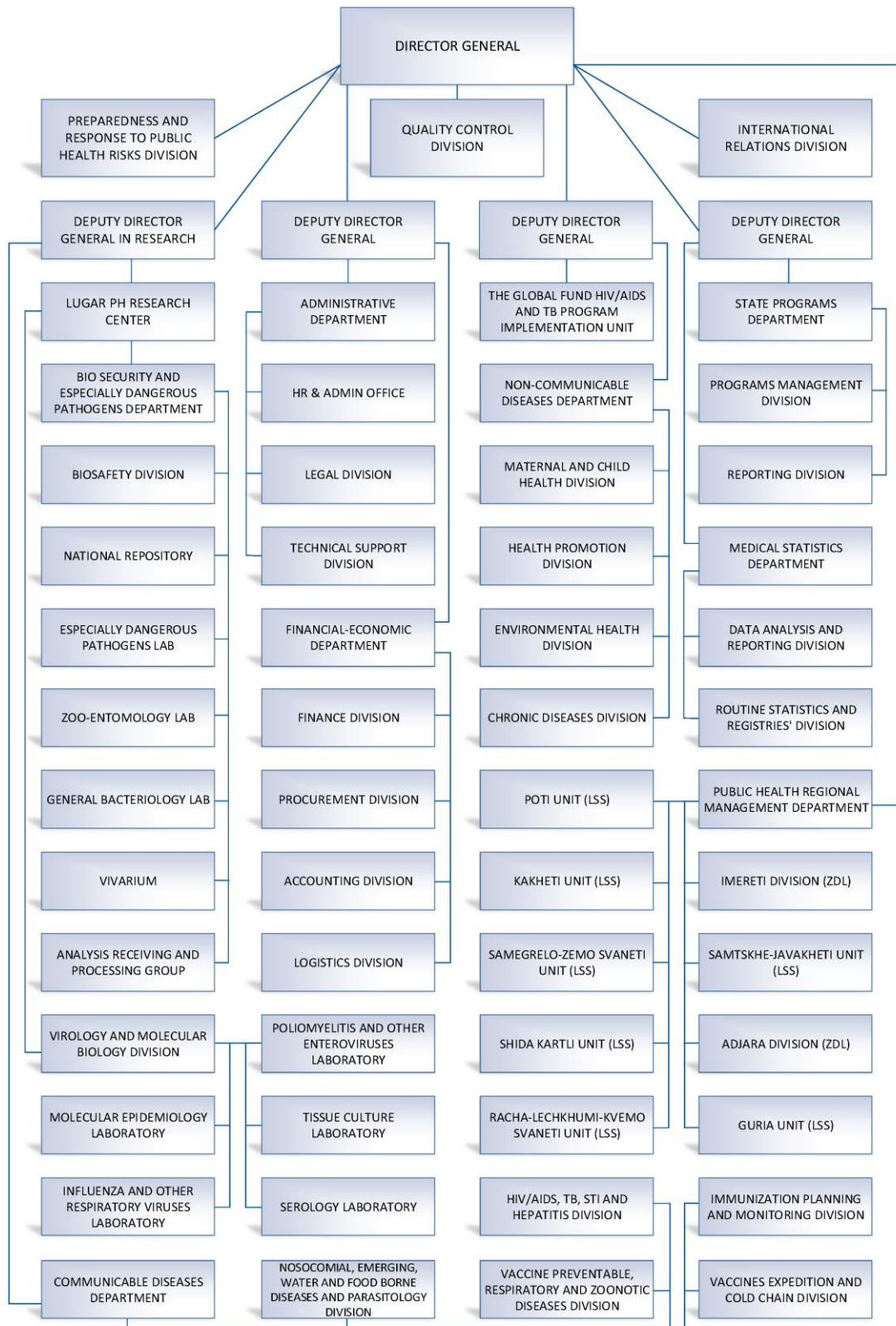
In 2016 National Center for Disease Control and Public Health (NCDC) in compliance with the priorities and commitments of Development Strategy and 5 Year Action Plan of the National Center for Disease Control and Public Health for 2013-2017, in partnership with the state and non-governmental organizations and other partners, continuously implemented monitoring, assessment and evaluation of population health status and risks; surveillance, control and prevention of communicable and non-communicable diseases; assessment of environmental and human health threats; support of Integrated Laboratory System and the collection of pathogens for proper functioning; as well as promotion of science and education in the areas of public health, epidemiology, microbiology, immunology, molecular biology and genetics.

In 2016 the events dedicated to the 20th anniversary of the National Center for Disease Control and Public Health were held under the slogan "Twenty Years at Public Health Service": International scientific conference "Public Health and Global Health Security: Vision for Tomorrow"; Expanded Session of the Country Coordination Council for prevention and control of non-communicable diseases; Press conference dedicated to the World Antibiotic Awareness Week; Meeting on National Antimicrobial Resistance Surveillance Network; Visit of Assistant Secretary for Global Affairs of US Department of Health and Human Services - Mr. Jimmy Kolker and liaison officer for Global Affairs office - Ms. Karen Matthews to the Lugar Center of Public Health Research; 12th International Yersinia Symposium and NCDC anniversary ceremony.

NCDC Management Hierarchy



NCDC Organogram



1. Decrease of morbidity, disability and mortality due to communicable diseases

National Center for Disease Control and Public Health, as the leader of the Real-Time Surveillance Action package within the Global Health Security Agenda is actively working on development of integrated disease surveillance system. The system is based on the One Health Approach (includes human and animal health) and integrates EIDSS (Electronic Integrated Disease Surveillance System), LIMS and already introduced public health system - e-Health. Cooperation in this direction is active on the regional level (Azerbaijan, Armenia, Ukraine, Kazakhstan).

1.1 Immunization

Immunization and achieving high coverage rates are among the highest priorities of the centre

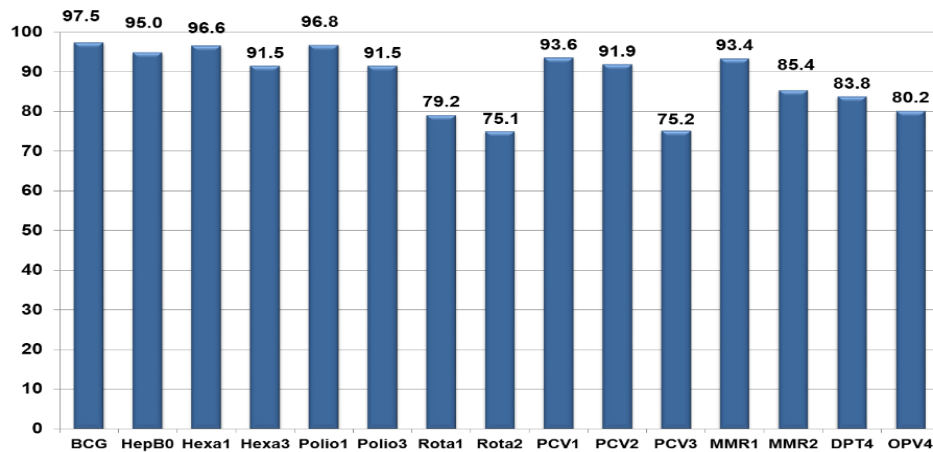
- Bivalent oral poliomyelitis vaccine was successfully introduced in the country since April 18, 2016;
- For the first time since 1990, 2015 was remarkable for zero reporting of rabies cases, which maintained through 2016;
- In frames of influenza preparedness for 2016-2017 season 20 000 doses of seasonal flu vaccine was procured, and selected target population was vaccinated timely;
- Large-scale communication activities were implemented during the European Immunization Week, dedicated to the achievements and challenges faced in the process of Measles and Rubella elimination in the country. The cycle of trainings on practical immunization topics and the “National immunization schedule and immunization management” (decree #-01-57/n 19.11.2015) were held in every district for epidemiologists, physicians and nurses (more than 2000 specialist were trained).

Key achievements of 2016

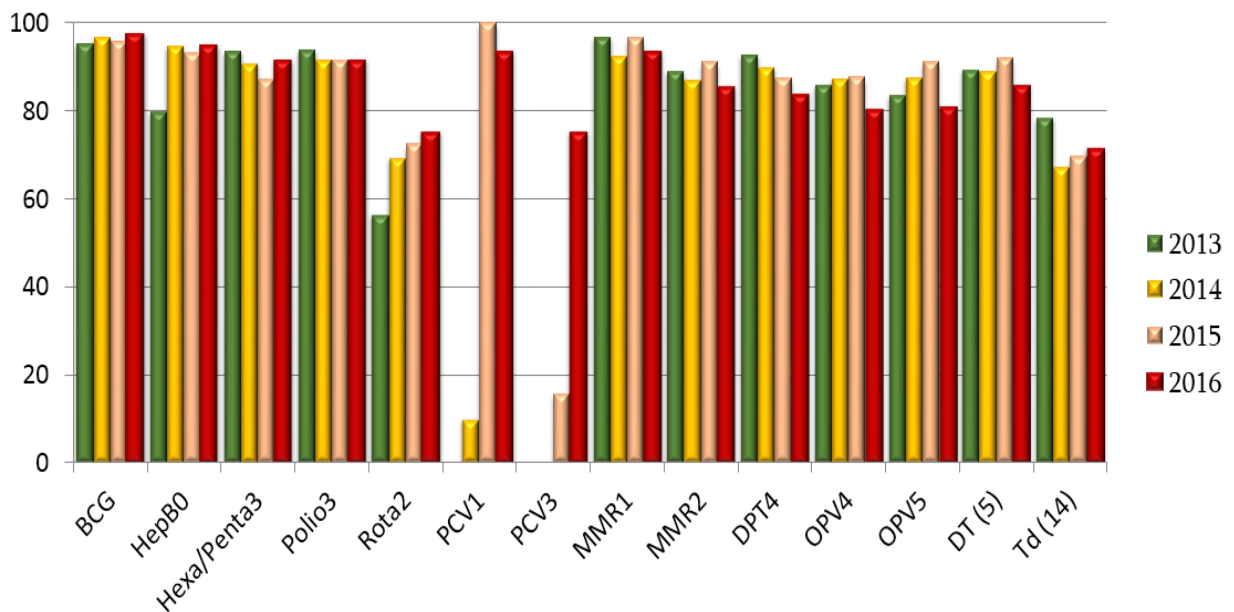
- 2017-2021 comprehensive Multi-Year Plan (cMYP) was developed
- The mobile and web application on vaccination for parents developed and was introduced
- The project of Demo introduction of HPV vaccine in 2017 for 9 year age group girls was approved
- Bivalent OPV was successfully introduced
- Countrywide immunization coverage survey was conducted
- The KAP survey was conducted
- Vaccine preventable, respiratory and zoonotic diseases:
 - ✓ 2 grant applications were prepared and funded by CDC Atlanta
 - ✓ Measles and Rubella surveillance guidelines were prepared
 - ✓ Update of influenza seasonal preparedness plan was implemented (twice)
 - ✓ Document describing the Measles and Rubella situation in the country was prepared and submitted to the WHO certification committee
 - ✓ Surveillance on the influenza like diseases was maintained

- In 2015-2016 the Immunization coverage survey was conducted in three major cities (Tbilisi, Kutaisi and Batumi) and the rest of Georgia in 31 districts selected, using cluster sampling method. The survey aimed at validation of the immunization coverage and assessment timeliness of vaccination.

Immunization, coverage (%), Georgia 2016



Immunization, coverage trend (%), Georgia, 2013-2016



- To meet the country needs in regard to the routine and specific immunization, more than 50 000 kg of vaccines, serums, immunoglobulins and syringes were safely delivered, stored and distributed by the centre during the year; management of 26 674 L cold chain equipment was in place; additional storage capacities have been set up (Rustavi, Kutaisi, Batumi) and uninterrupted logistics of required medicinal products was provided. The Cold Chain system was equipped with automatic alarm system. On average every 1.5 month vaccines and serums were expedited throughout the country, in total 1 450 000 doses of vaccines were distributed in 2016.

1.2 Surveillance of Communicable Diseases

In order to embody international demands and modern challenges, diseases of the elimination concern have been managed in accordance with relevant standards

Measles-Rubella:

- Guideline on surveillance of Measles and Rubella was developed. In 2016, surveillance was established upon 58 cases of measles, out of which 44 were declined. 14 cases of measles were recorded in 2016.
- In 2016, surveillance was established on 103 measles cases, out of which 91 were declined. 12 cases of rubella were registered in 2016.

Key achievements of 2016

- Hepatitis C Elimination, TB and HIV Strategies were developed and approved by the Government of Georgia;
- Preventive and treatment dehelminthization of 300 000 children of 5-9 age group was started off;
- National AMR Strategy was developed and approved;
- Amendments were made to the National Program for supporting the elimination of mother-to-child transmission (EMTCT) of HIV and syphilis;
- Global Aids Response Progress Report 2016 was developed;
- Specialists of Public Health Centers were trained in accordance with the new requirements of tuberculosis surveillance;
- Sentinel Surveillance was established upon antimicrobial resistance of *N. gonorrhoeae*.

Poliomyelitis:

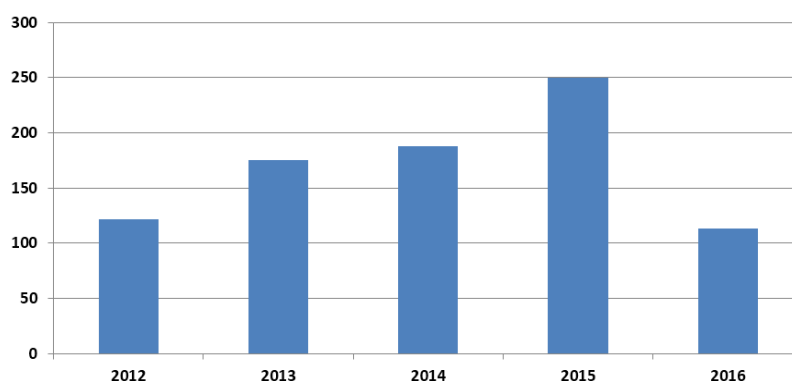
- IPV vaccination was introduced in the country.
- Surveillance on acute flaccid paralysis cases was actively implemented. 16 cases of AFP were investigated.

Malaria: No local case of malaria was recorded in 2016. Surveillance was established on 18 suspected cases, out of which 7 cases were confirmed (imported).

Hepatitis C: In accordance with the Hepatitis C elimination strategy, surveillance was established on Hepatitis C; screening protocol as well as standard case definitions were developed for viral hepatitis; specialists of Public Health Centers were trained on Hepatitis C issues; based on the Sanford Guide the application for hepatitis C treatment was developed.

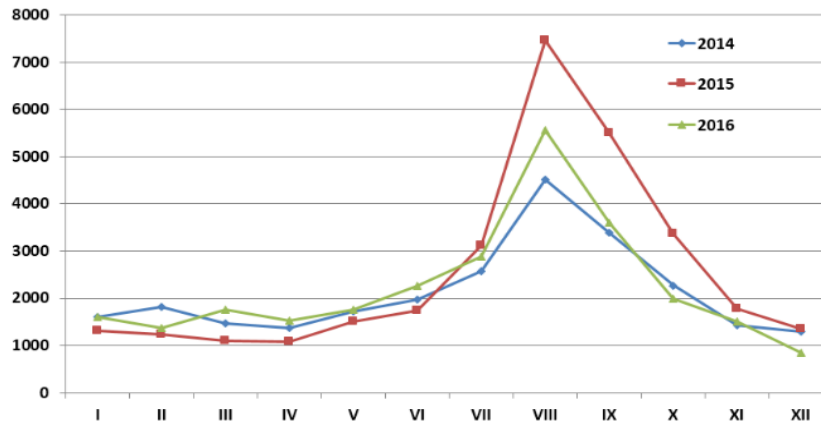
Nosocomial Infections: Throughout Tbilisi, 19 hospitals were evaluated by the effectiveness of the measures taken for infection control and prevention. Healthcare staff of 4 multiprofile clinics were trained on infection control and antimicrobial resistance. The cycle of trainings on infection control and prevention was regularly held with Georgian Dental Association and 200 dentists were trained. Within the World Antibiotic Awareness Week, the campaign of raising awareness of population on the usage of antibiotics was held. National AMR strategy was developed and approved in January, 2017.

Nosocomial Infections, Georgia, 2012-2016



Water and food borne infections: regular monitoring and surveillance have been conducted on diarrheal diseases and foodborne poisoning. 27 050 diarrheal cases of suspected viral etiology were registered in 2016 (incidence 720, 8). 24 diarrheal disease outbreaks related to drinking water and food were investigated, out of which, 11 outbreaks of bacterial or viral etiology were confirmed (Shigella, Escherichia, Norovirus and Rotavirus).

Monthly distribution of diarrheal cases of a probable viral etiology, Georgia



9 large outbreaks of probable food poisoning and 10 botulism cases were investigated, out of which 2 cases (with 5 sick persons) were group cases, household case and the rest sporadic cases.

A total of 34 380 probable foodborne poisoning cases were recorded by healthcare facilities throughout the country in 2016, which is 7% higher than the rate of previous year.

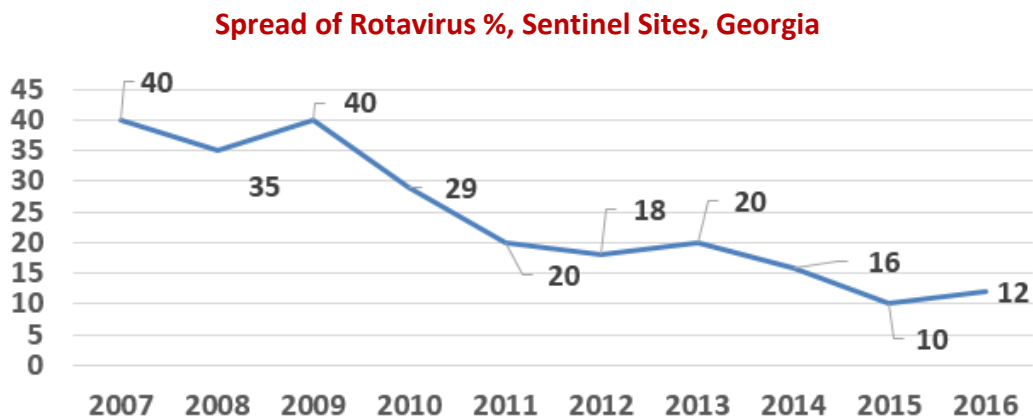
Parasitic and Foodborne diseases: in Georgia, 7 cases of Tropical Malaria were reported and investigated, all of them were imported cases. 2 of them were students from African countries and 5 of them were Georgian citizens, who worked in different African countries. 2 Dengue Fever cases were also reported. As a result, different events against vectors of vector borne diseases were planned and implemented across the Georgian Black Sea resort zone. With the help and support of WHO Regional Office for Europe about 102 000 children of 5-9 age group undergone curative and prophylactic dehelminthization.

HIV/AIDS: HIV/AIDS GARPR (Global AIDS response progress reporting) report for 2015 was developed. Data requested for questionnaire of Dublin declaration about partnership of Europe and Central Asia within the fight against HIV/AIDS has been collected for European Centre for Disease Prevention and Control.

For TB surveillance improvement: Public Health Center specialists were re-trained according to new requirements of the surveillance. Epidemiological investigation and informational streams were monitored in Public Health Centers, including epidemiological investigation of special cases. In relation to implementation of new diagnostic tools (GeneXpert), National TB Program was amended (expansion of patient contact study).

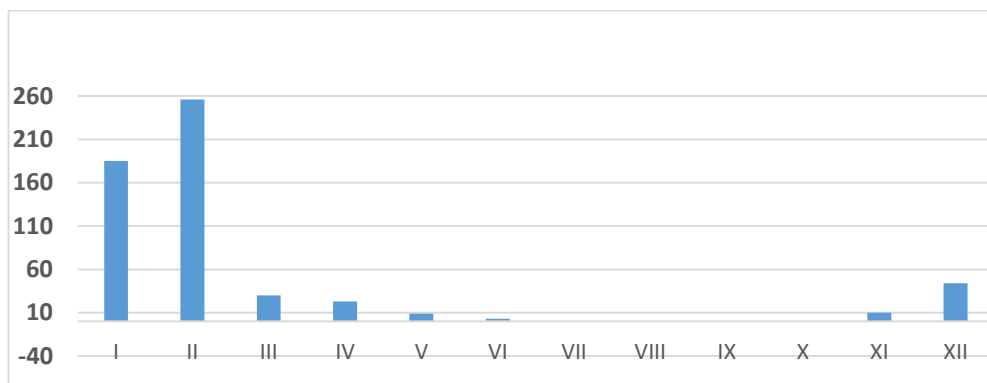
Sentinel surveillance of bacterial meningitis was implemented in children of 0-5 age group, especially focused on: *Haemophilus influenzae type B (Hib)*, *Streptococcus pneumoniae (Sp)* and *Neisseria meningitidis (Nm)*. In 2016 9 cases of *Streptococcus pneumoniae (Sp)* were reported, including 7 in sentinel surveillance and 1 of them vaccinated. In Georgia *Neisseria meningitidis* cases were 4 and 3 out of them were registered by sentinel surveillance. *Haemophilus influenzae type B* induced meningitis case was only 1 and was also registered by sentinel surveillance.

After nationwide implementation of **Rotavirus vaccination**, RV Diarrhea cases were declined, among investigated persons. In 2013, share of diarrheas caused by RV was 20%, in 2014 – 16%, 2015 – 10%, 2016 – 12%.



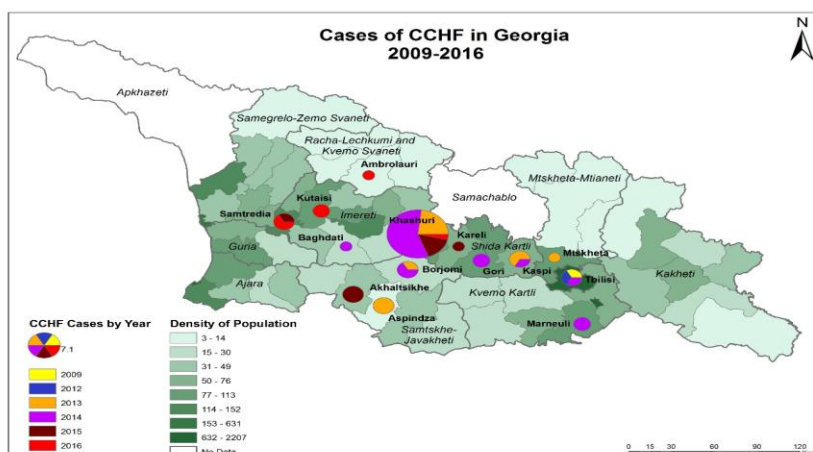
Since the end of 2016 **sentinel surveillance for influenza has been available with state financing**. Individual study of lethal cases was conducted and as a result risk groups for vaccination were expanded. As an exception, over one calendar year (2016), 2 sequential seasonal spread took place, that is quite rare.

Laboratory confirmed influenza cases in 2016 by months, Georgia



In 2016 Surveillance was established on: 27 cases of the Anthrax (Cutaneous anthrax). Compared to the same period of the previous year the number of cases have been reduced twice. 184 cases of brucellosis were registered.

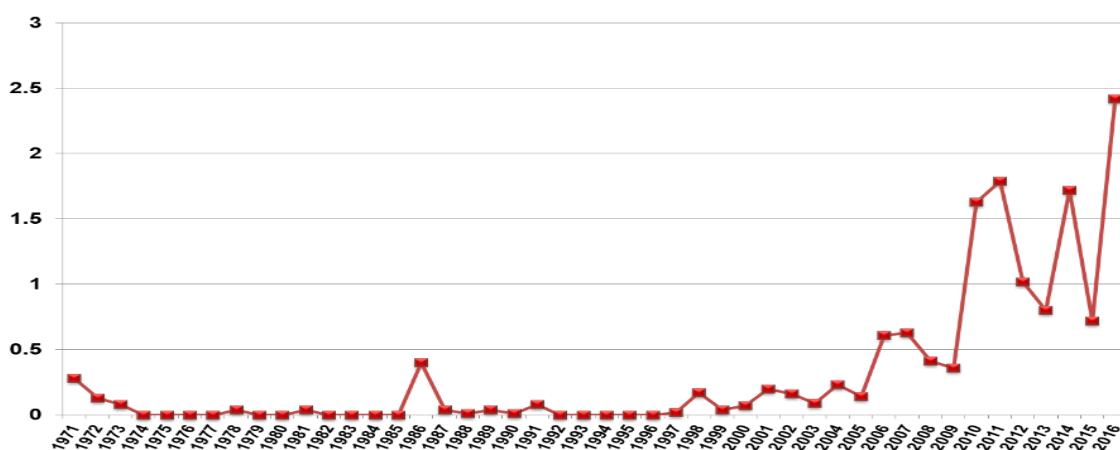
Surveillance was established on 41 suspected cases of Crimean-Congo hemorrhagic fever (CCHF), among which, 6 cases were confirmed and 2 were lethal (both new foci in – Ambrolauri and Terjola). Compared to the last year number of cases were decreased, however the area of spread is expanded. Cattle and cattle sheds were processed in every foci by National Food Agency on the basis of NCDC notification.



1 case of Orthopoxvirus and 27 Parapoxvirus cases were registered in Georgia in 2016.

2016 was distinguished by an unusual increase of morbidity caused by Leptospirosis, which is presumably related to the cyclic increase of the epizootic process, as well as to development of capacities in the surveillance and laboratory diagnostics.

Incidence of Leptospirosis, perennial dynamics, Georgia



1.3 Public Health Preparedness and Response

One of the major priority directions for NCDC is public health preparedness and response, which includes two directions: The Global Health Security Agenda (GHSA)/ International Health Regulations (IHR) and Emergency Operation Center (EOC).

National Center for Disease Control and Public health is designated as IHR National Focal Point, the responsibility of which is a rapid reporting to WHO on events that may constitute an unexpected or unusual public health event, risk for public health and international spread, as well as threats related to restriction of travel and trade.

Key achievements of 2016

- Taking part in GHSA ministerial, which also included chairmanship of bilateral meeting on real-time surveillance action package;
- Developing the Five-year action plan (Roadmap) with CDC;
- Taking part in GHSA Next Generation mentorship program;
- The meeting of Global Outbreak Alert and Response Network (GOARN);
- The revision of Epidemics, Pandemics and Biological Incidents response plan;
- Multisectoral risk communication training with experts from CDC;
- Developing Influenza response plan (short version).

The Global Health Security Agenda (GHSA) is an international collaboration with the aim to advance a world safe and secure from infectious disease threats. Georgia is actively supporting this initiative since its launch in 2014 and within GHSA.

On matters of Emergency Preparedness and Response in order to extend knowledge and gain experience, multisectoral risk communication training was held with experts from CDC.

IHR core capacity annual monitoring was held in 2016. Delegation of Georgia took part in GHSA ministerial, which also included chairmanship of bilateral meeting on real-time surveillance action package. Within the Global Health Security Agenda (GHSA) Five-year Action Plan (Roadmap) was developed with Centers of Disease Control and Prevention of the United States of America (CDC). The specialist of NCDC takes part in GHSA Next Generation mentorship program.

1.4 Utilizing of the Lugar Center Capacity

Biosafety

Activities carried out in the Center related to biological safety:

- In order to protect biosafety in the Lugar center, assessing biological risks of specialists working in high risk zones and control of security procedures carried out by laboratory workers were systematically performed in the reporting period.
- The following control procedures were performed in the Lugar center related to: The work of equipment such as biosafety cabinets, incubators, etc.; Biological waste management (autoclaving and their further incineration processes); The general procedural chain of clinical and environmental samples; Safe handling of microorganisms including EDPs in the National repository of bacteria and viruses; The processes like visitors entry, registration, notification, etc.

Key achievements of 2016

- The institutional biosafety committee was established;
- 15189 ISO Accreditation preparation process started;
- Documentation is being prepared for the accreditation of the biosafety training center;
- The Center received International Certificate of Biosafety Professional in the risk assessment and biosecurity;
- 38 Standard Operational Procedures (SOP) of biosafety were revised and reformatted in a new version;
- Biosafety issues were corrected in more than 100 diagnostic SOPs;
- The center was involved in the WHO Global Sewage Surveillance AMR Project and ECDC EPIS FWD networks;
- The center participated in the BARN network for detailed typing of bacterial strains identified in Georgia;
- Anthrax soil foci have been determined for prevalence activity;
- New focus of *F. tularensis* was revealed and studied in Kvemo Kartli region;
- First time in Georgia the causative agent of Tularemia was isolated and confirmed from human clinical sample (bubonic aspirate) on the seventh day of investigation;
- *Bartonella* species pathogenic for human was revealed in AIDS patients;
- Use of garlic as a bactericidal tool to anthrax spores decontamination (Turkey-Georgia experiment);
- Study of brucellosis and tularemia seroprevalence in farmers and veterinarians first time in Georgia;
- Formation of Animal Bioethics Committee.

The following inspections and trainings were carried out in accordance with biosafety rules during the year in the Lugar Center:

- ✓ 10 inspections of laboratories;
- ✓ 2 (2 day training) trainings for "Aversi" staff related to Biosafety issues;
- ✓ 11 (5 day training) trainings for interns in Biosafety issues;
- ✓ 2 (1day training) trainings for visitors.

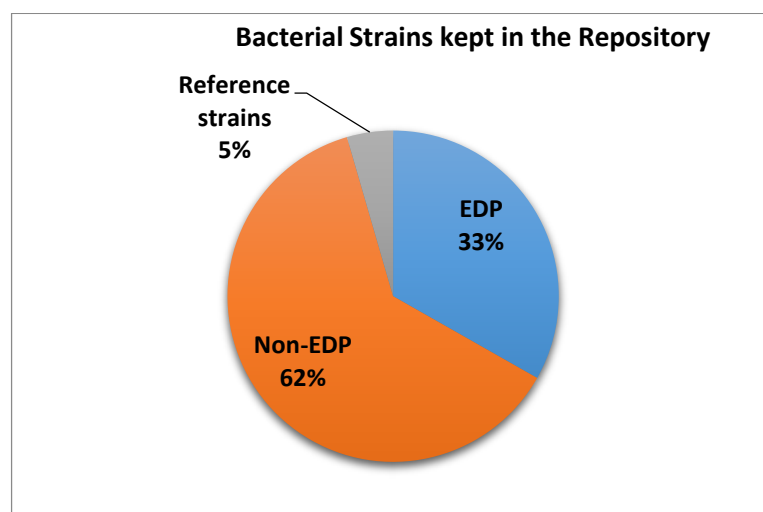
For Lugar Center staff the following trainings were conducted:

- ✓ 3 (2day training) trainings - BSL-3 laboratory work specifications;
- ✓ 2 (1day training) trainings - Risk assessment;
- ✓ 7 (1 day training) trainings - General Biosafety;
- ✓ 1 (5 day training) trainings - for zoentomology lab. specialists.

National Repository of Bacteria and Viruses

In 2016 the following activities were performed in the National Repository of Bacteria and Viruses:

- In the Pathogen Asset Control System (PACS) 152 microbial strains isolated in the territory of Georgia were registered, including 134 Especially Dangerous Pathogens (EDPs); 88 - reference strains received from CDC Atlanta and 8 ATCC strains (delivered by Ch2Mhill);
- For research purposes the following strains were prepared and delivered to the laboratories:
 - *Shigella* - 33 strains, *Salmonella* - 2, *E. coli* - 16, *Leptospira* - 17 serotypes, CDC reference strains - 88; ATCC strains - 34 (total 190 strains); *F. tularensis* - 138 strains (for protein synthesis and DNA sequencing), *B. anthracis* – 30, *Brucella* -19 strains (total 187 strains); 50 ATCC and vaccine strains (*B.anthraxis*, *F.tularensis*, *Y.pestis* and *Brucella*);
- For External Quality Control (EQC) 39 microbial strains were prepared and delivered to medical centers and clinics (Veterinary laboratory in Qakh, Azerbaijan; "Cito", "Aversi", "Microbiologist", etc.)
- According to IATA international regulations hazardous category of imported and exported biological goods (24) were assessed and documentation sent to the Customs Department;
- 45 disinfectants (delivered by 23 companies) were studied for bactericidal effect;



- *Francisella tularensis* strains kept in the repository were studied for invasion and virulence ability (in vitro) in macrophage cells;
- Antimicrobial susceptibility (in vitro) of *Yersinia pestis* strains were studied to 10 antibiotics;

- Biofilm formation ability of *Yersinia pestis* strains were studied (*First time in Georgia*);
- Passport data of EDP strains (*Y. pestis*, *Brucella*, *B. anthracis*) kept in the repository were mapped by isolation foci using Geographical Information System(GIS).

Laboratory of Especially Dangerous Pathogens

The following studies were performed in the laboratory on EDPs:

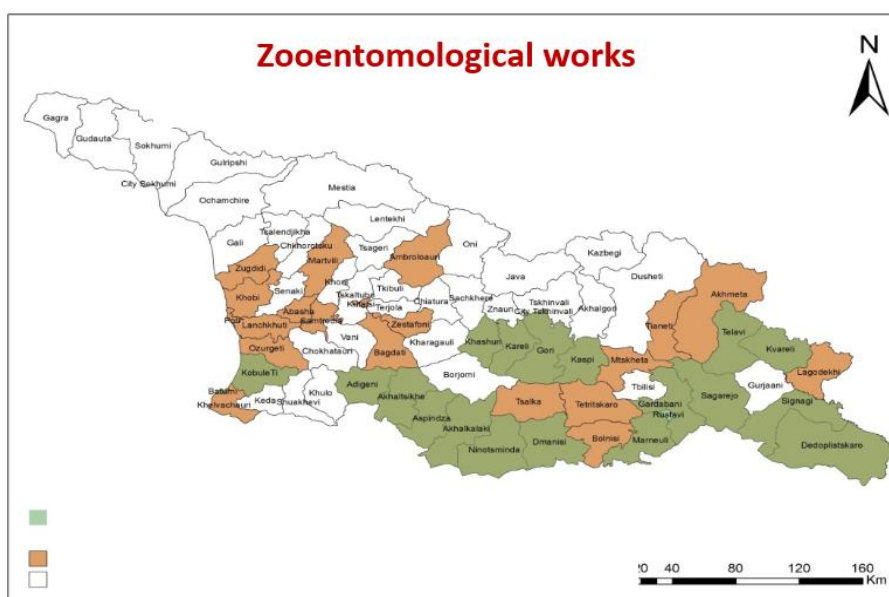
- Clinical materials – 600 samples,
- Environmental samples:
 - Rodents – 500
 - Ectoparasites - 6100
 - Soil samples – 1700
 - Water Samples – 120

74 - *B. anthracis*, 1 - *F. tularensis* (isolated from clinical sample first in Georgia) and 3 – *Brucella* strains were identified and confirmed.

Zoentomological works

In 2016 the following zoentomological works were performed in Lugar Center:

- Epidemiological monitoring of infectious diseases, including natural outbreaks of especially dangerous infections was performed. Monitoring was held in 7 regions of Georgia - on the territories of 18 administrative districts;
- 317 631 hectares of open workstations (25% funded by center, 75% - funded by GG-19, GG-27, GDD and other projects) and 9 020 m² closed workstations (65% center office funds, 25 % by GG-19, GG-27, GDD and others projects) were investigated;
- Number of reservoirs obtained in open and closed workstation of naturally occurred outbreaks of hazardous infections amounts to 755 live and synaptic rodents (21% funded by center); Number of rodents is increased in natural foci compared to previous years (12-15 per 1 ha);
- Number of obtained vectors (ticks) - 21 590 (13.8% - funded by center);
- In 2016 year *Ae. aegypti* - 14 units. *Ae. albopictus* - 34 units. *Gx. pipiens* - 415 units. etc. were collected;
- 9 129 ticks on the cattle were tested;



- The laboratory has been assigned 1 397 samples of soil (2.9% funded by center);
- For the first time the existence of the Crimean-Kongo Diseases (CCHF) - *H. marginatum* in Ambrolauri and Oni municipalities (460 m above sea level) and 1 169 m above sea level in the Tianeti municipality was confirmed;
- In order to study spread of invasive mosquito *Ae. albopictus*, open warehouses of second hand tires and adjacent territories (total 82 points) were examined;
- In Tskaltubo in 10 houses of Internally Displaced Persons zoentomological studies were conducted for the first time.

General bacteriology

- Pilot research has been carried out to strengthen the bacterial research of *Streptococcus pneumoniae* and introduce serotypes for pneumococcus detection;
- AMR Investigation was successfully conducted;
- For the first time the collection / processing of information on the AMR was conducted and data was published in the CAESAR annual report;
- 135 Standard Operation Procedures (Technical Standards for General Bacteriology and Soil Preparation) were created;
- 85 working schemes/flowcharts for the ISO 15189 accreditation were created.

The following investigations of the sporadic cases were carried out:

- 256 Samples (404 tests) were investigated, with 124 positive results;
- Under the State Surveillance Program nosocomial infections component 247 samples (1 588 tests) were investigated – with 118 positive results;
- Under the State Surveillance Program malaria component 92 samples (184 tests) were analyzed - 7 positive results;
- Commercial services - 156 samples (764 test), 44 - positive results (the income of the center's budget amounts to 5 260 GEL);
- AST was performed on 687 isolates;
- Investigation of 1 170 samples (4 216 tests) was conducted under PoP study - 166 positive results;
- CDC / GDD Surveillance Project of Sexually Transmitted Diseases - 275 samples (1 284 tests), 46 positive results;
- CDC / GDD Diarrheal diseases surveillance project - 94 isolates out of which 52 isolates were typed as *Sh. Zonnei*; 27 - *Salmonella spp*; 14 - *Sh. Flexneri*;
- Under CBR/GG-21 Fever Diseases Research Project 245 samples investigation (4 165 tests) was conducted.

Outbreak investigations were conducted:

- 29 clinical samples from Akhaltsikhe region (non-bacterial etiology);
- From Zugdidi region - 14 clinical samples (was detected *Shigella sonnei*);
- From Marneuli region - 12 clinical samples (non-bacterial etiology);
- From Rustavi - 23 clinical samples (was detected *Shigella sonnei*);
- In Tbilisi, out of Olympic Games participants - 11 clinical samples (was detected *Shigella Sonnei*).

Vivarium

The main achievements:

- Training (2 – month training) of Georgian specialists by the Walter Reed Army experts in the international standards for the care and use of laboratory animals in research;
- Formation of Animal Bioethics Committee

Analysis receiving and processing Group

The following activities were conducted in 2016:

- Working on ISO accreditation standards;
- 18 854 clinical and environmental samples were registered;
- 18 854 samples were registered within the projects;
- Pre- and post analytical SOPs were created;
- Working flow charts were developed according to ISO standards.

Investigation of poliomyelitis and other enteroviruses

- National Polio Laboratory performs investigations on samples of Acute Flaccid Paralysis (AFP) cases throughout the country, as well as in Armenia. In addition, polio laboratory conducted environmental surveillance by sewage water sampling in various regions of Georgia (Tbilisi, Batumi, Kobuleti, Borjomi, Telavi, Gori, Ozurgeti, Marneuli, Gardabani);
- Virological investigations with the aim of isolation Polio and other enteroviruses were performed in three types of cell lines;
- In total 280 samples were investigated and 29 strains isolated in 2016;
- Isolates were sent to Finland, Helsinki RRL WHO, for future investigation;
- Within the WHO external control Polio Laboratory successfully performed proficiency testing of two types of panels: isolation of polioviruses in cell cultures and poliovirus intratypic differentiation using real-time RT-PCR.

Influenza and other respiratory viruses testing

1871 combined nasal and pharyngeal swabs were received at influenza laboratory for testing on influenza and other respiratory viruses.

- All specimens were screened for influenza viruses by real time RT-PCR and 433 were positive for A/H1p, 51- A/H3 and 24 –B;
- 725 samples were tested for other respiratory viruses using Multiplex PCR and 502 specimens found positive on one or more respiratory pathogens;
- Influenza laboratory participated in External Quality Assessment programs organized by WHO for three times. 30 blind specimens were tested using real time RT-PCR and obtained results uploaded in relevant databases.

Preparation/Use of cell culture

- The work on 13 different cell lines was performed during 2016: RD, L20B, ND7/23, J774, Neuro 2a, Hep-2, MDCK, six lines of Hybridoma HS108;
- Within the GG19 project study of invasion and virulence of *F. tularensis* strains using J774 macrophages was conducted;
- Within the GG23 project work on six lines of Hybridoma HS108 cultures was conducted.

Serological and molecular investigations carried out under different programs and projects

Within various programs and projects, in total 40 021 serological tests were conducted at the Lugar Center.

- Hepatitis, measles and rotavirus serology proficiency panel tests, sent within the scope of ISO accreditation, were performed successfully by the Serology Group;
- Laboratory participated in the proficiency testing within WHO external quality control program. Samples were sent to the Luxembourg Measles/Rubella referral laboratory for repeat testing. In both cases, testing and retesting cases concordance between laboratories was 100%.
- Within the WHO program „Hospital-based sentinel surveillance of rotavirus gastroenteritis and evaluation of disease burden in Georgia“ laboratory participated in the proficiency testing and was estimated - 100%.

Under Hepatitis C management state program:

- 15206 serological tests were conducted using Abbott Architect, i2000: HCVcore Ag – 4712; HCV Ab – 2829; anti-HBc Ab – 2378; HBs Ag – 2533; HIV Ab/Ag – 2754.
- 984 samples from Harm Reduction Network were tested on presence HCV RNA using Abbott m200sp and m2000rt molecular analyzers.

Project - "Hepatitis C recombinant strain RF1_2k/1b: establishing laboratory diagnostic standards and its implications for national hepatitis C elimination program:

- Three HCV positive samples were sequenced at Lugar Center on Illumina MiSeq platform.

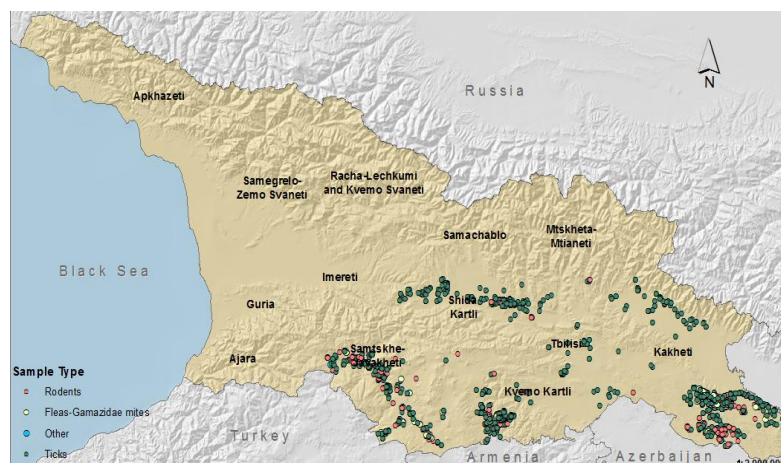
Project - CDC-GDD- Laboratory Capacity Building of Molecular Genotyping Technology for Surveillance Improvement of Vaccine Preventable Infections: Measles, Rubella and Rotavirus

- Measles case was genotyped and identified genotype D8. In the future it will be possible to establish (identify) circulating genotypes in the country without sending specimens for testing to the referral laboratory

Under the project GG-21 “Human Disease Epidemiology and Surveillance of Especially Dangerous Pathogens in Georgia” 6889 serological tests were performed.

Project GG19 - Epidemiology and Ecology of tularemia in Georgia:

- Overall 900 voluntaries have been involved in this project, the same number of the blood samples were collected and questionnaires filled for each participant. Samples were tested on presence of antibodies against tularemia by microagglutination (MAT) assay. The MAT positive samples were checked for other pathogens as well. In total 553 serological tests were performed in 2016;
- Under the active surveillance of tularemia in the environment the field works were performed in Shida-Kartli, Kakheti and Samtskhe-Javakheti regions;
- The collected vector and rodent samples were merged as 6,129 pooled specimens;
- Molecular testing with PCR was performed on 2 103 samples; Two *F. tularensis* strains were isolated, from which one was obtained from human sample;



- For all samples including clinical and environmental samples the databases were created. The epidemiological analysis is being launched and currently is under the processing;
- One of the new methods for study of virulence factor of tularemia was established. The mentioned approach is based on using of macrophage cell cultures. In addition the resistance testing of *F. tularensis* strains was done.

To support surveillance activities in the country various molecular tests were performed for detection especially dangerous and other pathogens during 2016.

DTRA/BAA Project - Enhancing capacity for case detection and diagnosis of febrile zoonotic-related cutaneous lesions in Georgia. The primary aims of this effort are to build capacity for technical skills related to the detection and diagnosis of poxviruses and establish a surveillance system for febrile rash illnesses in Georgia.

- Clinical specimens were tested on orthopoxvirus and parapoxvirus infections; new orthopoxvirus infection has been identified;
- First time in Georgia, cowpoxvirus infection in human has been confirmed with genome sequencing.

Establishment of *Salmonella* and *Shigella* spp database based on pulsed-field gel electrophoresis (PFGE) typing:

- The national database for enteropathogens was established;
- 52 culture of *Shigella* spp isolated from different regions of Georgia (Adjara, Kartli, Imereti, Tbilisi) were studied. Genotyping was performed by PFGE method using XbaI restriction endonuclease; among these, 41 cultures were uploaded to the PulseNet national database and analyzed by the BioNumerix 6.6 program purchased within ISTC Project G-2099. 9 different but genetically very close groups were identified;
- 8 isolates of *Salmonella* were examined and uploaded to the PulseNet national database, among which were allocated four genetically different groups.

With the assistance and funding of MediLabSecure and Pasteur Institute External Quality Panel for molecular diagnostic of Arboviruses (Chikungunia, West Nile Fiver, Zika viruses) were sent from the Institute of Virology of Berlin. Testing was completed successfully.

Tuberculosis

- Study of “**Molecular Epidemiology of Tuberculosis**” (TB) was carried out within **ISTC** funded project. Study was conducted using 24 locus MIRU-VNTR typing and Spoligotyping on 254 resistant cultures of *M. tuberculosis* (250 MDR and 24 XDR strains);
- 85 strains of *M. tuberculosis* were typed using 24 locus MIRU-VNTR methodology, each strain

showed an unique profile;

- **Project "Evaluation studies of Multidrug-resistant and extensively drug-resistant *Mycobacterium tuberculosis* novel assay using new pyrosequencing platform"** was carried out in collaboration with Singapore Genome Center
- In total 110 sputum specimens from TB patients were investigated. Presence of *M. tuberculosis* in each specimen was confirmed by GeneXpert MTB/RIF test, it means that all samples which were taken in molecular investigations, contained *M. tuberculosis*;
- 69 sputum samples contained sensitive strains of *M. tuberculosis*. From these specimens 54 were involved for assessment of the method. Results from different methods coincided in 51 cases (94%);
- 41 sputum samples contained resistant strains of *M. tuberculosis* as it was previously shown by GeneXpert MTB/RIF test. 24 samples were involved for assessment of the method. Results from different methods coincided in 14 cases.

Project TAP-12 - Analysis of previously identified Rickettsia positive Georgian Ticks by Multi-locus Sequence Typing

- 85 pooled tick samples which were determined to be *Rickettsia* positive were assessed by MLST and species-specific qPCR to identify the *Rickettsia* species present;
- Four protein coding gene fragments of the *Rickettsia* genus were characterized by MLST: *ompA*, *ompB*, *gltA* and *sca4*. 9 species of *Rickettsia* were found among 12 different tick species from five different genera, including: *Ixodes*, *Hyalomma*, *Haemaphysalis*, *Dermacentor*, and *Ripicephalus*;
- Distribution of the tick-borne rickettsiae detected were mapped and newly identified endemic area(s) were discovered for Georgia;
- For the first time in Georgia, the SFG species *R. massiliae*, *R. monacensis*, *R. conorii*, *R. helvetica*, *R. hoogstraalii*, and *Candidatus R. barbariae* were detected in tick samples from the country;

Within the **German-Georgian joint project "Establishment of a Network for Biosecurity and Diagnostic of Dangerous Infectious Disease"** together with the Bundeswehr Institute of Microbiology (IMB) number of activities were conducted:

- NCDC representatives participated in the 15th Medical Biodefense Conference in Munich, April 26-29, 2016. Hosts of the conference were IMB and German society of military medicine and pharmacy;
- The field study for vector (Ticks) collection in the village Iormuganlo, Kakheti was conducted. Approximately 500 ticks were collected, which were identified morphologically and tested on presence of tick born encephalitis virus (TBEV) using RT-PCR method. Approximately 500 milk samples were tested using ELISA method on presence of TBEV antibodies;
- 1800 human sera were tested on presence of TBEV antibodies using ELISA and IFT methods.

Project - Seroprevalence of Zoonotic Pathogens Among Veterinarians, Farmers and Animals - Comparative Analysis in Georgia and Jordan - 1 674 serological tests were conducted. New tularemia foci were discovered;

Project - Distribution and Diversity of Bartonella Pathogens among People and Animals in Georgia and Evaluation of Factors Associated with the Emergence of Bartonellosis - 105 serological tests were conducted;

DTRA / BAA project - Molecular Virology Studies in Georgia - with collaboration of institutions such as USAMRIID, WRAIR and PHE England:

- Within the project validation of Hanta virus (*Hanta dobrova*, *Hanta puumala*) molecular diagnostic kit was successfully performed;
- Sequencing assay based on new MinION technology was performed at PHE England on 12 CCHF

positive samples from Georgia;

- In addition CCHF Next Gen whole genome sequencing was performed on MySeq platform at NCDC. Significant data was obtained.

Project - Whole Genome sequencing of quarantine plant bacterial pathogen *Ralstonia Solanacearum* Isolated in Georgia

- During the project main characteristics of chromosomes and plasmids of the specimens were analyzed;
- SNP (Single Nucleotide Polymorphism) analysis revealed regions with synonymous and nonsynonymous mutations.
- Following genes were analyzed: 16S and 23S ribosomal RNA, Cold shock protein, DNA polymerase III alpha subunit, DNA polymerase III beta subunit, DNA polymerase III gamma subunit, endogluconase.

Project - Phage mediated antibiotic resistance gene transfer in marine, freshwater and extreme environments:

- The ultimate goal of the project is to study viruses as a reservoir of antibiotic resistance genes and horizontal gene transfer mechanisms in marine, freshwater water environments as well as in geothermal springs.

GRDF Project Characterization of mechanisms of adaptive phage-host co-evolution using next generation sequencing and phenotypic profiling:

- During the project whole genome sequencing of - *B. melitensis*, *B. anthracis* and their related bacteriophages was performed;
- The specific loci in the genome related to the phenotypic changes were selected and analyzed;
- Six specimens were selected and whole genome sequenced.

DTRA/BAA project - Characterization of NCDC Strain Repository by Next Generation Sequencing

- 10 *F. tularensis* and 10 *Brucella* spp strains were sequenced with Next Generation sequencing technology using Illumina Miseq Platform; first raw data analysis was performed using different bioinformatics tools;
- Poster presentation “Comparison of 12 *Francisella tularensis* Whole Genomes from the Country of Georgia” was prepared for an international conference.

ISTC Project G-2101:

- Under the project G-2101 activities 250 bats were tested for presence of Lyssavirus, Coronavirus, Yersinia, Leptospira and Brucella pathogens; None of the samples were positive for Lyssa virus and Yersinia;
- 30% fecal samples and anal swabs were positive for coronaviruses by PCR, with preliminary research we identified 5 different phylogenetic groups;
- 13% of bats were positive for Leptospira by PCR and 51 % bat bloods culture positive for Bartonella Pathogen.

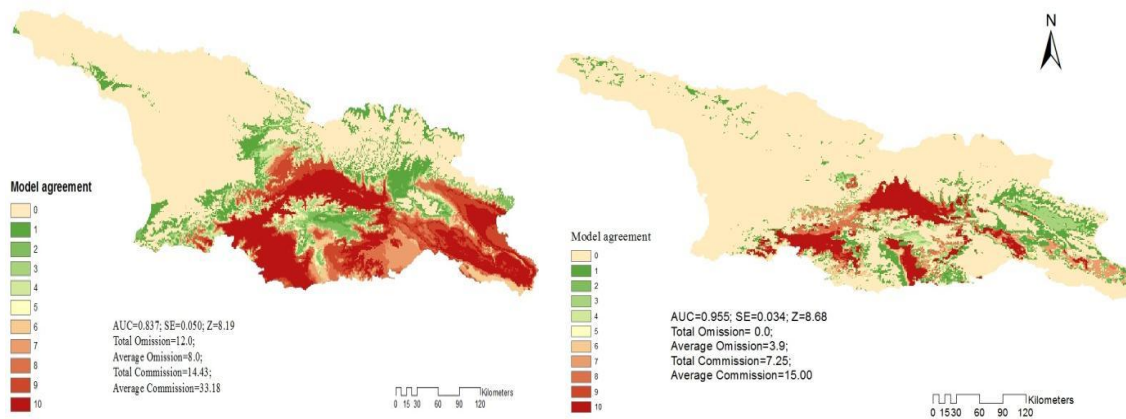
First time in the world brucella in bat spleen samples was found by PCR, further investigations at reference laboratory have led to culture isolation. Poster presented on the Brucella international conference won the First Prize;

- Based on the research results two manuscripts in PLOS neglected tropical Disease and Plos one journals were published.

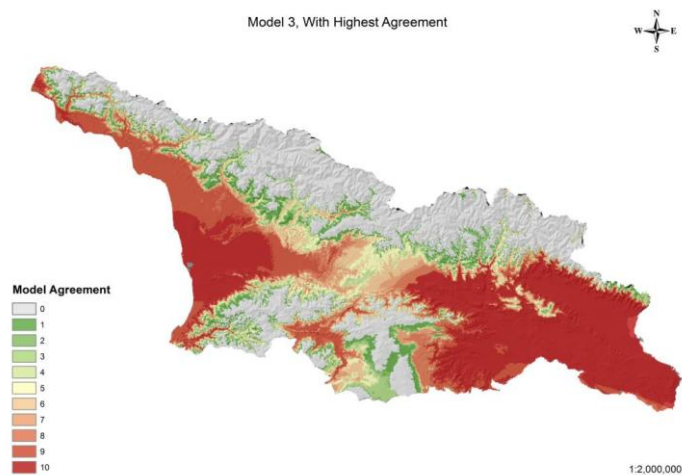
Geographical Information Systems (GIS) at Lugar Center:

- With the help of ESRI and Arc GIS programs maps for distribution of different pathogens by type, decades, ecology parameters (elevation, soil content) as well as maps for relationships of isolated strains were created and analyzed;
- GARP (Genetic Algorithm for Rule-set Production) program made possible to create ecological niche models for prediction of distribution of different diseases and vectors.

GARP model for distribution of tick *D. marginatus* (left) and *F. tularensis* distribution in *D. marginatus* (right)



GARP prediction model for *Bacillus anthracis* distribution in Georgia



2.1. Surveillance of Non-communicable Diseases

Despite the definite progress in the public health interventions and medical service accessibility improvement, the non-communicable diseases (NCDs) still remain serious challenge for the health system of Georgia. According to the 2014 annual report of the World Health Organization (WHO), 97% of mortality in Georgia is caused by NCDs and traumas. Among them, 69% of total mortality is attributed to cardiovascular diseases (CVDs), 14% - cancer, 1% - diabetes, 4% - chronic respiratory diseases, 6% - other NCDs, and 3% - traumas.

In 2016, the tendencies of morbidity of the most widespread NCDs – Cardiovascular diseases (CVD), cancer, chronic respiratory diseases (CRD), diabetes and traumatism – were analyzed. The analysis was based on the 2015 medical statistics.

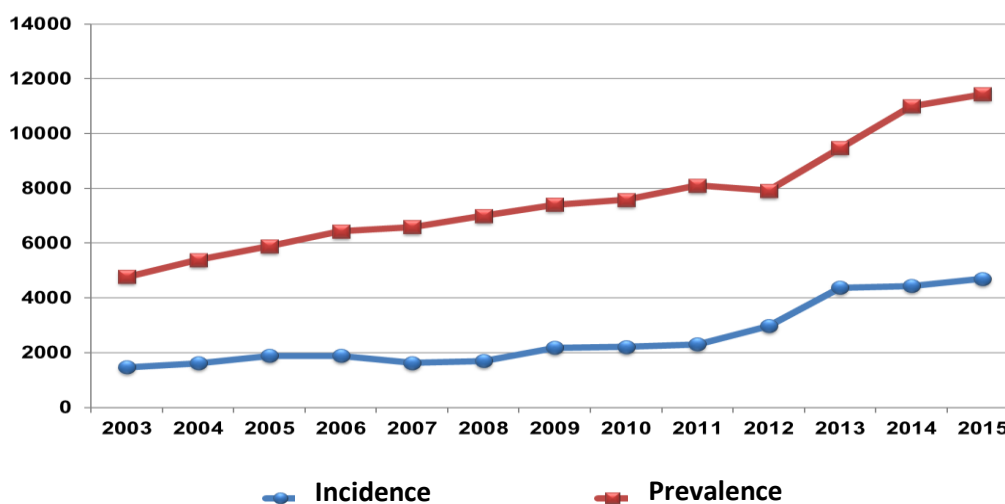
The CVDs: cardiovascular morbidity and mortality are still the serious problem to be coped with in Georgia. Moreover, the prevalence and incidence of the circulation system disorders in the country are characterized by growth.

Cerebrovascular diseases, most of which are considered as so-called endpoint of arterial hypertension, should become a subject of in-depth study because of the reduction of its prevalence and incidence rates in 2015.

Key Achievements of 2016

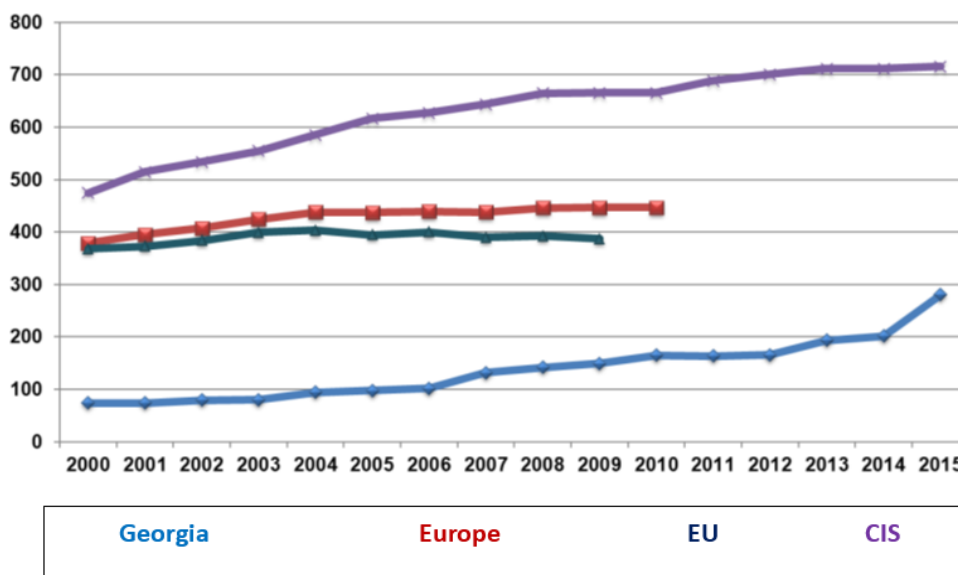
- According to the Decree #2 of January 11 2017 of the Government of Georgia, the NCDs Strategy and 2017-2020 Action Plan were adopted;
- Repeated STEPS Survey on prevalence of NCDs and their risk-factors, both behavioral and biological was conducted with the technical and financial support of the WHO;
- The work in accordance with the enforcement of major directions of the State Action Plan on Tobacco Control is underway;
- The third project of the Bloomberg Philanthropy “Supporting endorsement and enforcement of strengthened legislation on tobacco demand reduction in Georgia in order to meet WHO FCTC requirements” has started with the technical assistance of the World Lung Foundation and the International Union against Tuberculosis and Lung Disease;
- In the framework of the State Health Promotion Program, KAP (Knowledge, Attitudes and Practices) survey of the behavioral risk factors was carried out;
- Together with the MoLHSA, the First Report on Perinatal Health was developed;
- With the financial and technical support of the US Centers for Disease Control and Prevention a project “Strengthening on Micronutrient Deficiency Surveillance” is underway.

Morbidity of Circulatory System Diseases, Georgia 2003-2015



Among the possible reasons, in the first turn, the registration shortcomings should be considered. Described dynamics does not match with an increase in the rate of cerebrovascular diseases hospitalization.

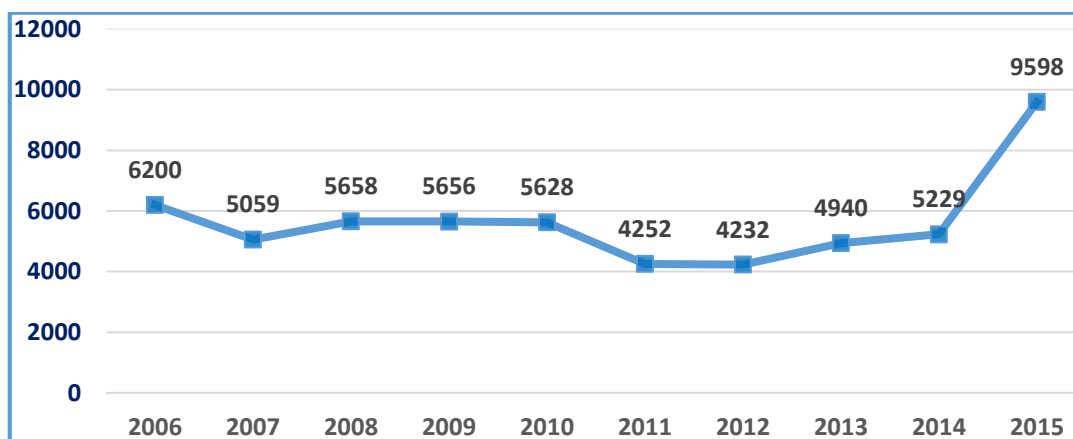
Hospitalization rate of cerebrovascular diseases per 100 000 population, 2000-2015



The Population Based Cancer Registry was established in 2015 in Georgia. Data collected within this registry significantly changed perspective regarding cancer morbidity. 9 598 new cancer cases were registered in 2015, which is about two-times higher than that of registered cases during the previous years.

The following cancer stage distribution for all localization of cancers was found: the first stage – 20%, second – 20%, third - 23%, fourth - 28%, unknown - 9%.

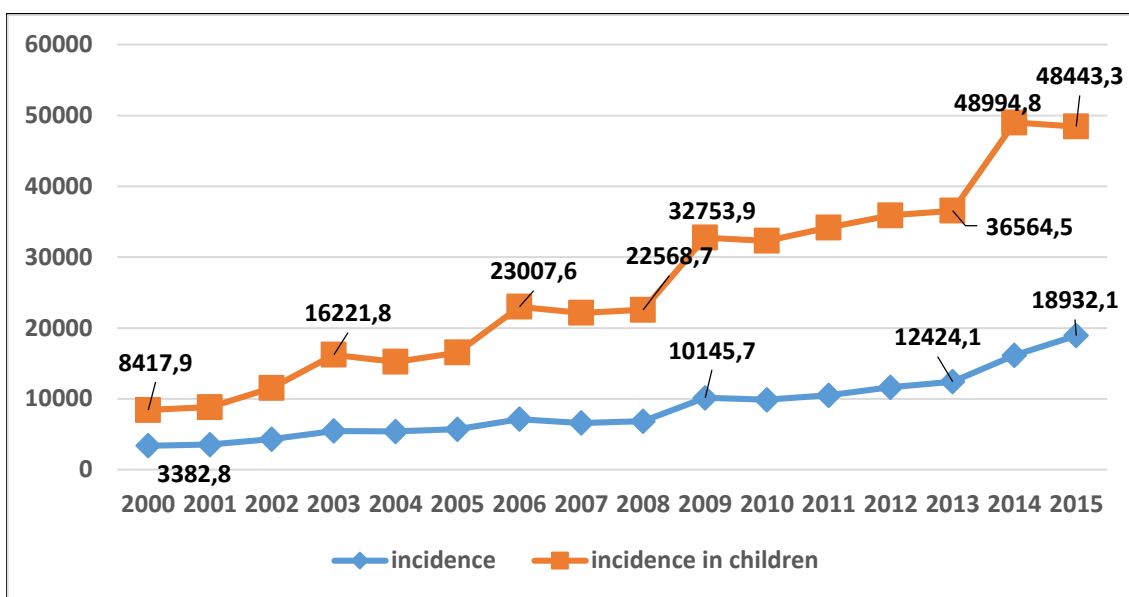
New cases of all localization of cancers, Georgia, 2006-2015



Chronic Respiratory Diseases: The incidence of respiratory system diseases in Georgia, as in many countries of the world, has an increasing tendency, caused by growing tendencies of air pollution and tobacco use.

The incidence of asthma and status asthmaticus is increasing as well as the trend of respiratory system diseases. Chronic and unspecified bronchitis accounts for most of the structure of chronic obstructive pulmonary diseases.

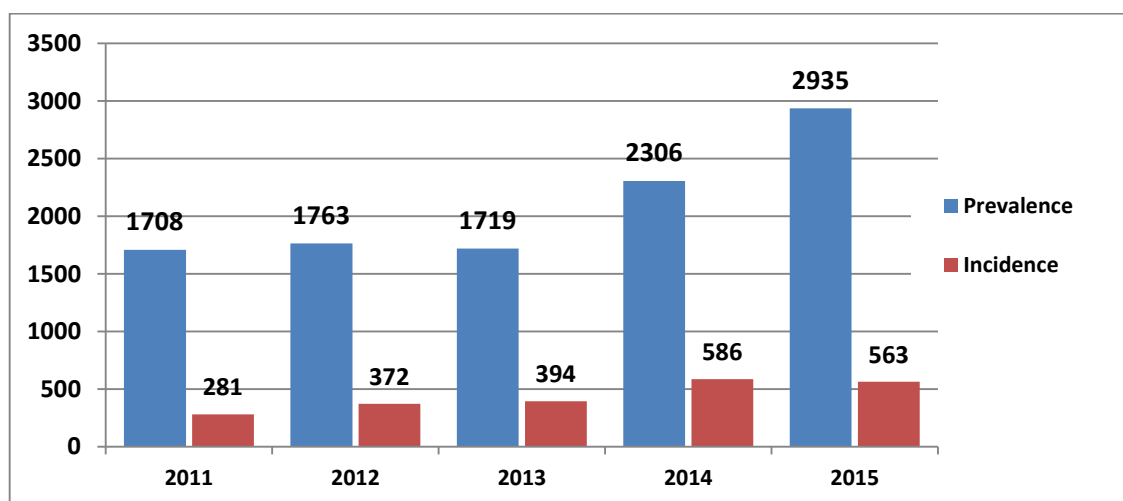
Incidence rates in total population and in children per 100000 population, 2000 – 2015



Morbidity of Diabetes Mellitus is one of the important healthcare problems in Georgia. Prevalence of DM is significantly high and gradually growing. According to the International Diabetes Federation data, published in the 7th edition of the Atlas of Diabetes, the prevalence of Diabetes mellitus among 20-79 years old population, was 7.5 per 100 000; Age-standardized comparative prevalence for diabetes was 6.4.

109 120 diabetic patients have been registered in 2015 in Georgia, out of which 20 955 were new cases (Prevalence - 2 935.6 and Incidence - 563.7 per 100000 population).

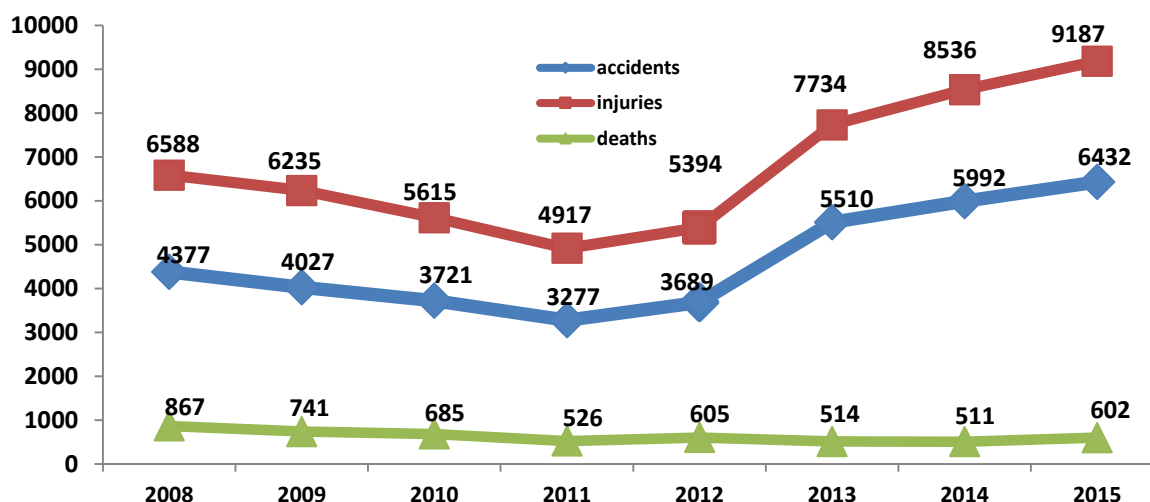
Prevalence and incidence of Diabetes Mellitus per 100 000 population, 2011-2015



Injuries are a major and growing public health challenge for Georgia and the fourth main cause of death. Injuries due to road traffic accidents have one of the leading roles in the structure of general injuries “Injuries, intoxications and other results of external exposition”.

In 2008-2014 the road traffic death rate per 100 000 population was characterized by declining tendency, but in 2015 it has been increased by 41.2% versus 2014.

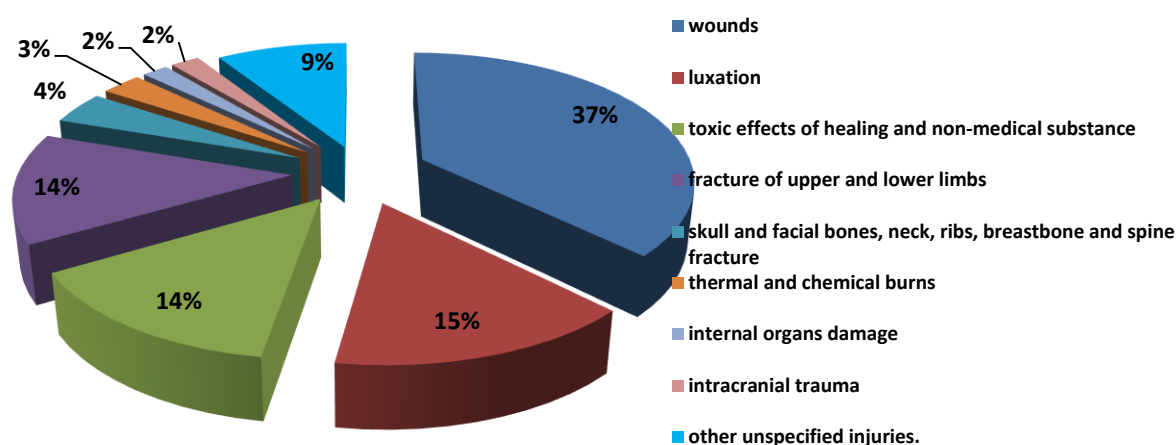
Reported trends in road traffic accidents, injuries and deaths in Georgia, 2008-2015



In the internal structure of the “Injuries, intoxications and other results of external exposition” among adult patients receiving outpatient services, the leading place hold wounds - 37%, luxation -15%, 14% - toxic effects of medical and non-medical substances, 13.5% - fracture of upper and lower limbs, 4% - skull and facial bones, neck, ribs, sternum and spine fractures, 2.8% - thermal and chemical burns, 2.5 % - internal organs damage, 1.8% - intracranial trauma, and 9% - other unspecified injuries.

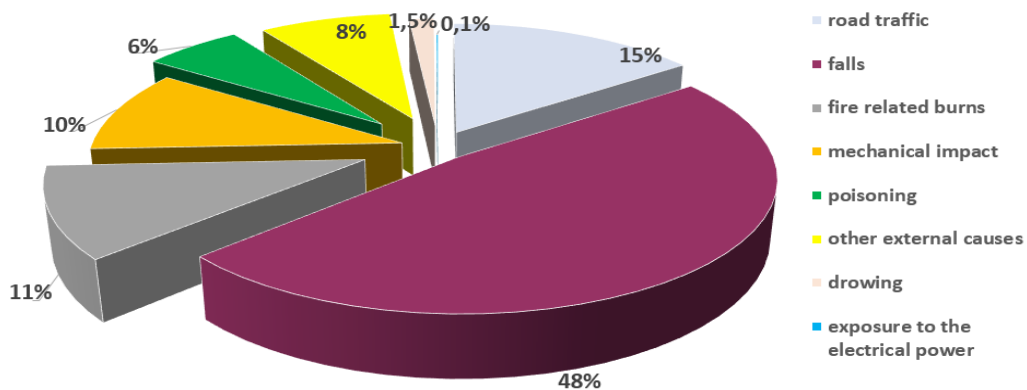
Structural analysis of the external causes of the injuries of hospitalized patients caused by the unintentional accidents revealed that 15% of the incidences (3 566 cases) are caused by the road traffic, 48% (11 314) - to falls, 10.5% (2 451) - fire related burns, 10% (2 354) - mechanical impact, 6% (1 433) - poisoning, 1.5% (341) - drowning, 0.1% (32) - exposure to the electrical power, and 8.2% (1 930) - to other external causes.

The internal structure of the injuries, intoxications and other results of external exposition among adult patients receiving outpatient services, 2015



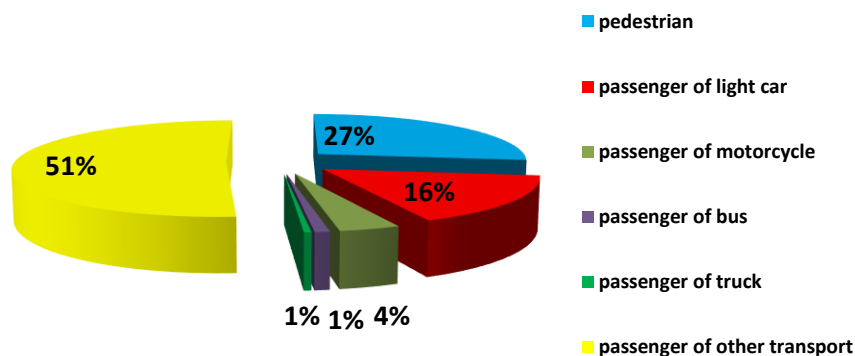
In hospitalized patients among the external causes fall is a leading in all age groups, followed by the road traffic accidents. The number of traffic accidents is highest in the age group of 16-45 years. 63% of patients hospitalized per accidents are men.

Percentage of distribution of hospitalized patients due to unintentional accidents by the external causes, 2015



As a result of differentiation of the causes of road traffic incidences, it is revealed that 27% of hospital patients are pedestrians, 16% - passengers of car, 4% - motor bikers, 1% - bus passengers, 1% - passengers of trucks, and 51% - other means of transport. The mortality rate among the hospitalized patients per unintentional accident is 1.7%.

Percentage of distribution of hospitalized patients due to road traffic crashes by the external causes, 2015



2.2 Health Promotion

National Health Promotion program “Public Movement for Healthy Georgia” was approved initially in 2015 and successfully continued the implementation in 2006. The State Program of Health Promotion 2016 included following five main directions (components):

Activities implemented under the component Support Strengthening of Tobacco Control

- Trainings for PHC personnel on the methodologies of short consultations for smoking cessation;
- Targeting trainings for executive structures responsible to identify and respond to violations of tobacco control legislation;
- Training of the hot-line operators according to WHO approved guideline for quit-line counselors; The guideline has been translated into Georgian as a useful instrument for hotline consultants.
- Monitoring visits to the selected facilities where smoking is prohibited to observe implementation of smoke-free policy in the facilities. A total of 529 randomly selected facilities (medical, educational,

hospitality, state, and public institutions) and 628 trade facilities were observed during the year (30% of the facilities located in Tbilisi, 70% - in other big cities).

- Educational / social media campaign focused on the advocacy activities, including TV, radio, internet-TV and online-radio reportings and programs, etc.
- Production of 3 social ads on tobacco control legislation issues such as the rights protection from second-hand smoke, tobacco free spaces and 4 personal video stories on tobacco issues.
- Informational and awareness raising banners on tobacco control legislation printed and placed in 2 subway stations during one month;
- on-line petition to amend tobacco control legislation was post (on www.manifest.ge) – and 3 000 sings were gathered.
- Social Media campaign provided: series of educational posts, info graphics developed on a Facebook page;
- Informational and promotional materials (brochures, leaflets, anti-smoking signs etc.) was developed and printed in Georgian, Azerbaijan and Armenian languages.
- Two trainings conducted in Tbilisi and Kutaisi for media representatives in educational campaign methodologies on Tobacco Control.
- First Knowledge, Attitude and Practice Survey regarding Tobacco and other behavioral risk-factors conducted - 2,481 people throughout Georgia were interviewed.
- Monitoring of “Packaging and Labeling of Tobacco Products”: monitoring of rotation of health warnings on local and imported tobacco products (the Revenue Service of the Ministry of Finance is responsible to update NCDC with this information
- Regulation of tobacco product content and information transparency: According to the Order of the Minister of Health, Labour and Social Affairs (MoLHSA) N122/N; of March 27, 2009, manufacturer or importer should submit to the (MoLHSA)) upon the request of the latter, but not more than once a year, conclusion on relevant tobacco products composition, verified in accordance to the ISO standard and issued by the accredited laboratory.
- Monitoring and Evaluation of implementation of National Tobacco Control Strategy - draft Tobacco Control legislative amendments have been developed by the working group under the State Committee of Strengthening Tobacco Control Activities and submitted to the Ministry of Labour, Health and Social Affairs. The NCDC, in its mandate as a secretariat of the committee, is in close collaboration with different stakeholders including civil sector working in the field. The alternative package of legislative amendments to strengthen tobacco control activities have been submitted to the Parliament of Georgia for Parliamentary Hearing.

Activities implemented under the Component - Healthy Eating and Awareness Raising on Excessive Alcohol Use:

- Educational media campaign was conducted: TV reporting, broadcasting, invited guests program, internet TV or radio channels; Articles in printed or internet media channel.
- Fb page “healthy nutrition” was developed. 100 evidence based educational and information posts were developed and video stories and video clips developed and disseminated within 2015-year campaign
- 4 media seminars were convened in two biggest cities of Georgia (2-2 in Tbilisi and Batumi)
- 3 personal video stories and 3 video commercials were developed;
- 4 different kind of banners were developed and placed in metro stations;
- Public education materials in the form of booklets and coloring materials were developed. Booklets were translated into Armenian and Azeri languages.

Activities implemented under the Component- Promotion of Physical Activity

- For promotion of physical activity, education and awareness raising campaigns were developed in the framework of the 2016 State Program
- Educational social Media campaign have been conducted on Facebook page “physical activity”: evidence based education and information posts were developed and disseminated; Physical activity promotion video stories were prepared and disseminated within the 2015 year state program; 3 online quizzes were provided. By the end of the reporting year “physical activity “ Facebook page had gathered around 17 344 likes.
- Sports-entertainment events were organized in educational institutions (Tbilisi, Rustavi, Kutaisi).
- Media advocacy of physical activity was conducted, including invited guests program, reporting and broadcasting in TV, internet TV or radio channels; articles in printed or internet media channel
- Public educational materials in the form of booklets and posters were developed. Booklets and posters were translated into Armenian and Azeri languages. In total 40 000 posters, 5 000 booklets – were developed (90% in Georgian, 5% in Armenian and 5% in Azeri languages)
- In order to promote physical activity 3 personal video stories were developed
- Media seminar was convened for 20 journalists affiliated with high-ranked TV
- "Klasobana" game was painted in residential yards (Tbilisi, Rustavi and Kutaisi).

Activities implemented under the Component - Prevention of Hepatitis C and Public Awareness Raising

- Specially for the campaign, Fb page “Hepatitis C 2016” was developed. Evidence based educational and informational posts (in total 40), 6 blogposts, 3 online quizzes, 100 professional photos on hepatitis C were developed and disseminated
- Qualitative study – focus groups and in depth interviews was conducted (In total 7 focus group discussions and 8 in-depth interviews)
- Public educational materials in the form of booklets (in total 15 000) and posters (in total 5 0000) were developed (90% in Georgian, 5% in Armenian and 5% in Azeri)
- Media advocacy of hepatitis prevention topic was conducted, including invited guests program, TV reporting, broadcasting, internet TV or radio channels; articles in printed or internet media channels.
- Short video (20 seconds) was broadcasted during 2 month at least 6 times per day on both central and regional TV channels, covering 7 regions of Georgia
- Informational video (44 seconds and 20 seconds) was broadcasted through TV and internet media.
- Social digital advertisements in form of electronic banners placed on high ranked web portals
- Trainings were conducted for media representatives.

Activities implemented under the Component - Health Promotion Strengthening and Popularization, Including Mental Health Promotion

- Interactive web site and mobile application on health promotion have been prepared, with the aim to raise public awareness on health issues and behavioral risk factors, health promotion and healthy lifestyle. The interactive website also contains different logarithms, educational videos, educational materials, etc.
- was prepared mobile application of antenatal surveillance have been prepared
- Web and mobile applications were launched in test mode.

Within the framework of sub-component of Mental Health" a qualitative research was conducted in 13 focus groups in Tbilisi focusing on 3 main directions:"

- Maternal and children Mental Health (1 focus group with mothers of 1-6 years old children with

- confirmed mental problems) 1 focus group with mothers of 1-6 years old healthy children
- Overcoming the stereotypes, stigma and discrimination related to Mental Health (2 focus group participants with mental disorders and psycho-social disabilities; 2 focus groups with 18-30 year old people; 2 focus groups with 30-60 years old people)
- Prevention, early detection and management of mental health problems by specialists and primary healthcare specialists (2 focus groups with primary health care specialists; 2 focus groups with field specialists; 1 focus group with participation of experts / advocacy groups); The final report of qualitative research have been prepared with recommendations.

2.3 Maternal and Child Health

In spite of reduction in maternal and newborn mortality, the issue still remains as a critical public health concern in Georgia. In 2015, there were 589 cases of stillbirth in Georgia. Stillbirth rate has declined by 12% during the past decade and achieved 9.8 per 1000 births in 2015.

A significant decline of neonatal mortality was observed during the last period of time. Comparing 2012 to 2015 neonatal mortality rate has decreased by 36% and reached 6.1 per 1000 live birth. Early and late neonatal mortality rates were 3.6 and 2.5, respectively. The share of neonatal mortality in under-5 mortality has declined and was 60% in 2015. And share of neonatal mortality in 0-1 mortality has declined and comprised 70% in 2015.

During the last years, the rate of under-5 as well as the rate of under-1 mortality have reduced. Comparing 2003 to 2015 neonatal mortality rate has decreased from 18.3 to 8.6 per 1000 live births. As a result, Georgia has reached its target for Millennium Development Goal 4.

In 2015, 59 249 children were born in Georgia, from which, 6.1% of newborns were below 2500 gr, 86.2% were within 2500 - 3999 gr and 7.7% were more than 4000 gr. In comparison with previous years, there was a decline in newborn morbidity rate and reached 98.7 per 1000 live births.

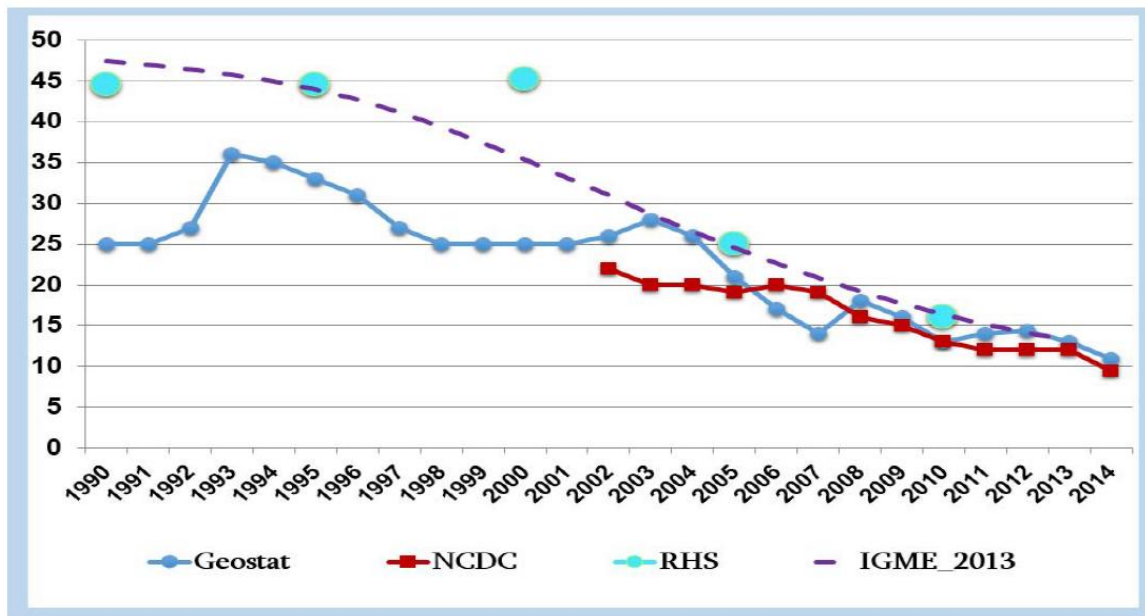
Among the various conditions, developed in perinatal period, the highest share comes to the respiratory system diseases that are typical for the perinatal period (42.6%). Conditions concerning the duration of pregnancy and congenital conditions accounts for 28% of perinatal morbidity. Respiratory system disease contributed the leading cause of disease in children under 1 (incidence-768.2). Respiratory system disease was the most common also in children under 5 (incidence-616.0) followed by infectious and parasitic diseases (incidence-114.7).

According to the United Nations Inter-agency Group for Child Mortality Estimation (IGME), in 2015 the mortality rate of children under - 5 was 11.9 per 1000 live births. Thereby the estimates of the official statistics of the county were very close to the estimates of IGME. Based on the official statistics, in 2015 the mortality rate of children under - 5 was 10.2 per 1000 live births.

In Georgia, the number of caesarean sections has been increasing during the last decade. Also increased tendency of contraception use was observed during the last years.

In 2015, 24 pregnant women died while pregnant or within one year from the end of pregnancy. Amongst 21 (87.5 %) were classified as maternal, directly or indirectly caused by pregnancy and 3 (12.5%) as deaths from co-incidental causes.

Under 5 mortality rate, Georgia, 1990-2015



Amongst 21 maternal deaths, 19 (90%) were early (maternal death during pregnancy or 0-42 days after pregnancy termination) and 2 (10%) late maternal deaths (maternal death during 43-365 days). Among early maternal deaths, direct obstetric causes accounted for 68% (13 cases) and indirect 16% (3 cases). Cause of 16% (3 cases) of all early maternal deaths was unknown.

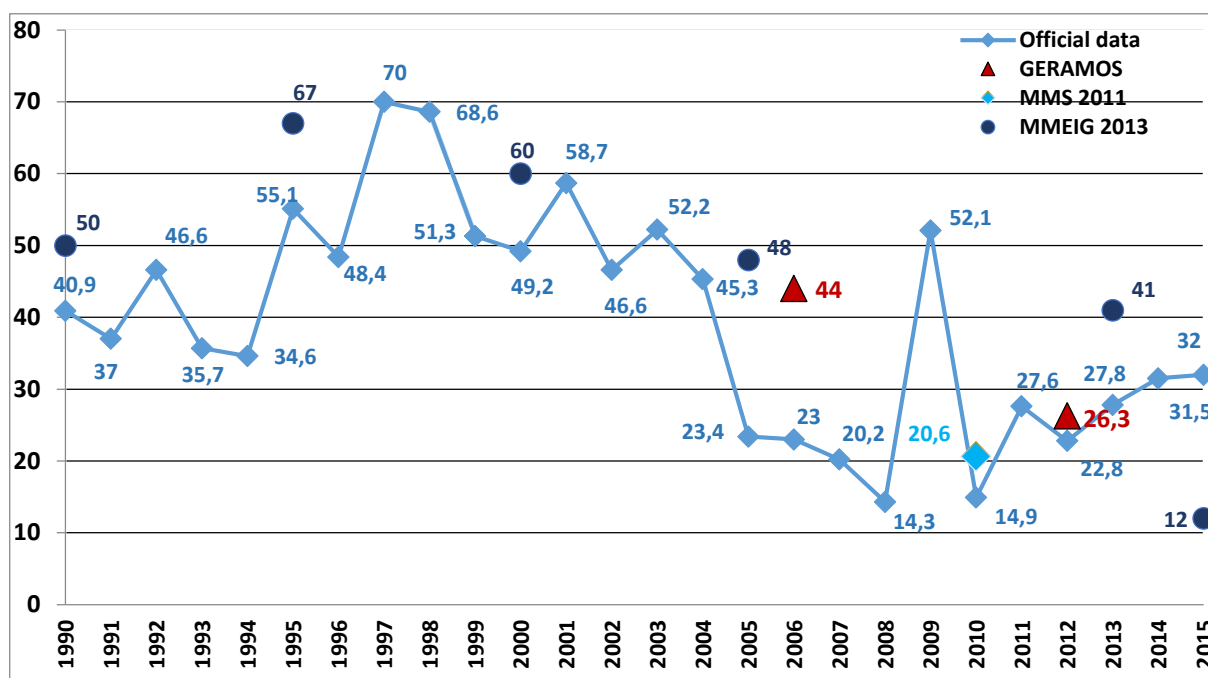
According to the national data The Maternal Mortality Ratio (early maternal deaths) for 2015 was 32/100 000 live births.

Out of a total 19 early maternal deaths, 57.9% were resulted from direct obstetric causes (11 cases) and 26.3% (5 cases) from indirect causes. 15.8 % of causes death reasons were unspecified. Hemorrhage (21% - 4 cases), infections (10.5% - 2 cases), preeclampsia (5,3% - 1 case) and obstetric embolism ((5,3% - 1 case) are the leading causes of maternal deaths. Notably, among direct causes: complications related with anesthesia and uterine rupture was 15.8%.

With target to improve maternal and child health information system, there were several steps implemented: In 2012, the NCDC implemented the active surveillance of death of reproductive age women (15 – 49 ages). Since 2015 the system also covers under 5 children mortality. The notifications are recorded by local public health offices that are responsible to collect information from local health facilities through Electronic Integrated Disease Surveillance System (EIDSS).

In January 2016, MoLHSA with NCDC launched an electronic registry “Mother’s and neonate’s health surveillance system”, so called “Georgian Birth Registry” (GBR). The system contains information on all cases of pregnancy-, delivery-, postpartum-, abortion, including maternal deaths, stillbirths and early neonatal deaths.

Maternal mortality rate, Georgia 1990-2015



2.4 Tobacco Control Strengthening

The Tobacco Control Group established in 2015 has been leading tobacco control strengthening measures and following activities has been performed:

- Training of PHC doctors in providing brief tobacco cessation interventions according to the WHO methodologies;
- Tobacco Taxation Policy document has been prepared;
- The third project of the Bloomberg Philanthropy “Supporting endorsement and enforcement of strengthened legislation on tobacco demand reduction in Georgia in order to meet WHO FCTC requirements” has started to be implemented with the technical assistance of the World Lung Foundation and the International Union against Tuberculosis and Lung Disease;
- Under the Tobacco Control Media Campaign Personal Story Advertisements (PSAs) and posters were produced;
- “Elaboration and Implementation the tobacco cessation smart phone application in Georgia” – the design and content for the smoking cessation mobile app was translated/adapted/elaborated; mobile app “I’m quitting” („თავს ვანებებ“) is operational
- “Smoking Prevention in Georgian Schools” - the training materials for teachers has been elaborated; the guideline was printed; pilot ToT 2 days trainings with selected 50 teachers was conducted;
- Tobacco “QuitLine” is operational in 5 days a week.

2.5 NCD Surveys

1. Non-communicable Diseases Survey - WHO STEPwise approach to Surveillance (STEPS), 2016
Main findings

A cross-sectional survey will be conducted using a multi-stage cluster sampling of the general population aged 18-69; 5554 households were selected, 4204 completed interviews have been collected.

Results for adults aged 18-69 years (incl. 95% CI) (adjust if necessary)	Both Sexes	Males	Females
Step 1 Tobacco Use			
Percentage who currently smoke tobacco	31.0% (28.9 – 33.0)	57.0% (53.6 – 60.3)	7.0% (5.8 – 8.2)
Percentage who currently smoke tobacco daily	28.0% (26.0 – 30.0)	51.5% (48.1 – 55.0)	6.2% (5.1 – 7.4)
<i>For those who smoke tobacco daily</i>			
Average age started smoking (years)	18.3 -	17.8 -	22.4 -
Percentage of daily smokers smoking manufactured cigarettes	98.6% (97.7 - 99.5)	98.4% (97.5 - 99.4)	100.0% -
Mean number of manufactured cigarettes smoked per day (by smokers of manufactured cigarettes)	21.3 -	22.2 -	14.4 -
Step 1 Alcohol Consumption			
Percentage who are lifetime abstainers	10.4% (8.9 - 12.0)	3.9% (2.6 - 5.3)	16.4% (14.1 - 18.8)
Percentage who are past 12 month abstainers	20.1% (18.5 - 21.7)	11.4% (9.5 - 13.3)	28.1% (25.8 - 30.4)
Percentage who currently drink (drank alcohol in the past 30 days)	39.1% (36.6 - 41.5)	58.9% (55.2 - 62.5)	20.8% (18.6 - 22.9)
Percentage who engage in heavy episodic drinking (6 or more drinks on any occasion in the past 30 days)	18.3% (16.1 - 20.6)	35.3% (31.2 - 39.4)	2.6% (1.7 - 3.5)
Step 1 Diet			
Mean number of days fruit consumed in a typical week	5.3 (5.2 - 5.4)	5.1 (4.9 - 5.3)	5.4 (5.3 - 5.6)
Mean number of servings of fruit consumed on average per day	2.0 (1.9 - 2.1)	2.0 (1.8 - 2.1)	2.1 (1.9 - 2.2)
Mean number of days vegetables consumed in a typical week	6.0 (5.9 - 6.1)	5.9 (5.8 - 6.0)	6.1 (5.9 - 6.2)
Mean number of servings of vegetables consumed on average per day	2.4 (2.3 - 2.5)	2.4 (2.3 - 2.6)	2.4 (2.3 - 2.5)
Percentage who ate less than 5 servings of fruit and/or vegetables on average per day	63.0% (60.1 - 66.0)	63.8% (59.6 - 67.9)	62.4% (59.5 - 65.3)
Percentage who always or often add salt or salty sauce to their food before eating or as they are eating	26.7% (24.7 - 28.8)	33.4% (29.4 - 37.3)	20.6% (18.6 - 22.7)
Percentage who always or often eat processed foods high in salt	14.3% (12.4 - 16.2)	18.9% (15.3 - 22.5)	10.1% (8.7 - 11.5)
Step 1 Physical Activity			
Percentage with insufficient physical activity (defined as < 150 minutes of moderate-intensity activity per week, or equivalent)*	17.4% (15.6 - 19.2)	16.2% (13.6 - 18.9)	18.4% (16.3 - 20.4)
Median time spent in physical activity on average per day (minutes) (presented with inter-quartile range)	137.1 (40.0 - 300.0)	158.6 (55.7 - 342.9)	173.8 (30.0 - 270.0)
Percentage not engaging in vigorous activity	82.4% (80.3 - 84.6)	72.2% (68.5 - 75.9)	91.8% (90.1 - 93.4)
Results for adults aged 18-69 years (incl. 95% CI) (adjust if necessary)	Both Sexes	Males	Females
Step 1 Cervical Cancer Screening			

Percentage of women aged 30-49 years who have ever had a screening test for cervical cancer			23.9% (20.6 - 27.3)
Step 2 Physical Measurements			
Mean body mass index - BMI (kg/m ²)	28.1 (27.8 - 28.4)	27.9 (27.5 - 28.3)	28.3 (28.0 - 28.6)
Percentage who are overweight (BMI ≥ 25 kg/m ²)	64.6% (62.3 - 67.0)	65.5% (61.4 - 69.7)	63.8% (61.4 - 66.3)
Percentage who are obese (BMI ≥ 30 kg/m ²)	33.2% (31.3 - 35.2)	30.2% (26.9 - 33.6)	36.0% (33.7 - 38.2)
Average waist circumference (cm)		95.7 (94.3 - 97.2)	89.6 (88.7 - 90.5)
Mean systolic blood pressure - SBP (mmHg), including those currently on medication for raised BP	129.4 (128.4 - 130.4)	132.6 (131.3 - 134.0)	126.5 (125.4 - 127.6)
Mean diastolic blood pressure - DBP (mmHg), including those currently on medication for raised BP	82.2 (81.6 - 82.8)	83.0 (82.1 - 84.0)	81.4 (80.7 - 82.1)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP)	37.7% (35.5 - 40.0)	38.6% (35.1 - 42.2)	36.9% (34.7 - 39.1)
Percentage with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg) who are not currently on medication for raised BP	55.4% (52.1 - 58.8)	64.2% (59.3 - 69.0)	47.2% (43.4 - 50.9)
Step 3 Biochemical Measurement			
Mean fasting blood glucose, including those currently on medication for raised blood glucose [choose accordingly: mmol/L or mg/dl]	4.4% (4.3 - 4.5)	4.4% (4.3 - 4.5)	4.4% (4.3 - 4.5)
Percentage with impaired fasting glycaemia as defined below • plasma venous value ≥6.1 mmol/L and <7.0 mmol/L	2.0% (1.4 - 2.5)	2.0% (1.0 - 3.0)	1.9% (1.4 - 2.4)
Percentage with raised fasting blood glucose as defined below or currently on medication for raised blood glucose • plasma venous value ≥ 7.0 mmol/L	4.5% (3.7 - 5.3)	4.7% (3.5 - 6.0)	4.3% (3.4 - 5.2)
Mean total blood cholesterol, including those currently on medication for raised cholesterol [mmol/L]	4.3 (4.3 - 4.4)	4.1 (4.0 - 4.3)	4.5 (4.4 - 4.6)
Percentage with raised total cholesterol (≥ 5.0 mmol/L or currently on medication for raised cholesterol)	27.7% (25.5 - 29.9)	21.9% (18.6 - 25.2)	33.0% (30.4 - 35.6)
Mean intake of salt per day (in grams)	8.5 (8.3 - 8.6)	9.7 (9.4 - 9.9)	7.4 -
Cardiovascular disease (CVD) risk			
Percentage aged 40-69 years with a 10-year CVD risk ≥ 30%, or with existing CVD**	29.0% (26.1 - 31.8)	31.1% (26.2 - 36.0)	27.2% (24.4 - 30.0)
Summary of combined risk factors			
<ul style="list-style-type: none"> • current daily smokers • less than 5 servings of fruits & vegetables per day • insufficient physical activity • overweight (BMI ≥ 25 kg/m²) • raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg or currently on medication for raised BP) 			
Percentage with none of the above risk factors	7.6% (6.0 - 9.2)	5.7% (3.4 - 8.0)	9.3% (7.7 - 11.0)
Percentage with three or more of the above risk factors, aged 18 to 44 years	25.2% (22.1 - 28.3)	37.9% (32.5 - 43.3)	12.5% (10.2 - 14.8)
Percentage with three or more of the above risk factors, aged 45 to 69 years	48.6% (45.7 - 51.5)	55.1% (50.4 - 59.8)	43.4% (40.2 - 46.5)
Percentage with three or more of the above risk factors, aged 18 to 69 years	36.1% (33.8 - 38.4)	45.4% (41.7 - 49.2)	27.6% (25.5 - 29.8)

2. In the framework of the State Health Promotion Program, a KAP (Knowledge, Attitudes and Practices) survey of the behavioral risk factors was carried out – for the first time in Georgia behavioral determinants of knowledge and attitudes was assessed.
3. The report of the European School Survey Project on Alcohol and Other Drugs (ESPAD) was prepared and launched.
4. The report of the Survey “Alcohol and Substance Use Among the General Population in Georgia” was prepared and launched.
5. Lead Poisoning in 2-5 years old children – 254 ambulatory and hospital patients of Iashvili Children’s Hospital were studied. Lead concentration more than 10 mg/dl was observed in 10%.
6. Strengthening of Pedestrian Trauma Surveillance for Prevention of Pedestrian’s Injuries – the following conclusions have been obtained:
 - a. This study results revealed that the data from reporting organizations are incomplete.
 - b. Most cases are linked with risky behaviors of pedestrians and drivers
 - c. 5-9 years old children are at the highest risk
7. Assessment of the Nutrition and Physical Activity Skills and Weight in School Age Children – the survey was conducted in 9-11 grade adolescents in Tbilisi and Batumi using the NYPANS methodology; recommendations have been developed.
8. “Strengthening of micronutrients deficiency surveillance systems” collaborative (CDC-NCDC) Project (GNMSS) in 8 sentinel sites (health facilities) in 4 Regions of Georgia (Ajara, Samegrelo, Tbilisi, and Kakheti). 3 nutritional indicators are under investigation in three target groups: iron, iodine and folate in 1st trimester pregnant women; iron in 12-23 months babies; and iodine in school age children.

Two types of laboratory tests were used in this study project: 1. Laboratory analysis of blood samples on iron and folate, 2. Laboratory analysis of urine samples on iodine/well-accepted, cost-efficient and easily obtainable indicator for iodine status for population based survey. The iodine deficiency was not detected in Georgian population – on the contrary, there is a slight elevation of iodine levels in the school age children, which may be a result of iodized salt consumption.
9. Iodine National Survey – the survey protocol is under elaboration.
10. Child Marriage Qualitative Survey - the survey protocol is under elaboration.

3. Environmental Impact and Behavior Risk-factors Assessment and Correction for Improving Georgian Population’s Health

- A. In accordance with the implementation plan of the EU-Georgia Association Agreement**
- Works have been carried out on National Environmental Health Action Plan (NEHAP); with EU technical and financial support works have been initiated on the twinning project “Strengthening of Environmental Health System in Georgia”.
 - Passports of Environmentally Associated Disease Indicators SEIS have been developed and adapted to the local conditions.

Key achievements of 2016

- With EU technical and financial support works have been initiated on twinning project “Strengthening of Environmental Health System in Georgia”
- Works have been carried out on National Environmental Health Action Plan (NEHAP) and creation of Environmental Health indicators;
- With the support of the European Technical Assistance and Information Exchange Mechanism (TAIEX), the EU Experts Mission visited Georgia for the "Improvement of Medical Waste Management System in Georgia"
- 3 publications were published in collaboration with WHO

B. In the process of implementing practical measures in order to assess, control and prevent the impact of environmental risk factors on human health

1. In January 18-22, 2016, EU Experts Mission visited Georgia for the "Improvement of Medical Waste Management System in Georgia"
2. The Advocacy Strategy Document on Global Climate Change was reviewed and comments and suggestions presented to the Red Cross Society of Georgia and the Austrian Development Agency within the second phase of the joint project "Climate Forum East".
3. Conclusions were prepared on the projects: "Sanitary Protection Zones of Lugela Mineral Water Ore", "Sanitary Protection Zones of Mukhrani Valley District Water Basin" and "Natakhtari Pipelines (Siphon, Coastal) Underground Freshwater Water Supply Sanitary Protection Zones"
4. Within the project "Legislative and Action Framework for Collecting and Sharing Information on Hazardous Chemical Substances in Georgia" a dialogue between different interested agencies on chemical safety was initiated; Situational analysis was conducted; Demo version of the Hazardous Chemical Substances Registry was prepared, Design of the web-page was developed, Draft of proposals for Legislative Amendments and First Georgian Chemical Safety Terms Dictionary were developed.
5. To ensure high quality of medical services in university clinics and the prevention of hepatitis C - for maintaining adequate sanitary-epidemiological regime, a questionnaire was prepared, regulatory documents were reviewed;
6. Various materials were prepared on the mortality burden related to air pollution;
7. In 2016, 237 applications were submitted to register 322 disinfectants, out of which 124 were registered and 136 - denied.

C. To increase public awareness and knowledge on impact of environmental risk factors on human health

1. Material was prepared on mass screening of children on lead on the basis of US, European and Asian countries experience;
2. In October 23-29, 2016 the International Lead Poisoning Prevention Week was marked with the slogan "Say No to Lead Paints";

Following publications were issued in collaboration with the WHO:

- **"Prioritizing pupils' education, health and well-being. Water, sanitation and hygiene in schools in the pan-European region (2016)** Peter van Maanen, Enkhtsetseg Shinee, Valentina Grossi, Márta Vargha, Nana Gabriadze and Oliver Schmoll
http://www.euro.who.int/__data/assets/pdf_file/0007/321838/Prioritizing-pupils-education-health-well-being-en.pdf?ua=1
- **"Повышение приоритетности образования, здоровья и благополучия школьников"** Peter van Maanen, Enkhtsetseg Shinee, Valentina Grossi, Márta Vargha, Nana Gabriadze and Oliver Schmoll
http://www.euro.who.int/__data/assets/pdf_file/0008/321839/Prioritizing-pupils-education-health-well-being-ru.pdf?ua=1
- **"The situation of water, sanitation and hygiene in schools in the pan-European region (2016)**
http://www.euro.who.int/__data/assets/pdf_file/0020/322454/Situation-water-sanitation-hygiene-schools.pdf?ua=1

4. Applied and Fundamental Biomedical and Biotechnological Research Capacity

Research studies are mainly carried out at the Richard Lugar Center for Public Health Research (Lugar Center), which unites the BSL2 and BSL3 laboratories, equipped with modern standards, and is the only in the Caucasus and Central Asia region facility possessing BSL3 capacity.

All clinical-laboratory diagnostic and scientific research, requiring the BSL-3 lab capacity, is carried out in the Lugar Center. The center has a "new generation sequencer" equipment giving unique opportunity for genomic research.

40 PhD and 36 Master's Degree specialists are employed at the Center.

Key achievements of 2016

- New Tularemia focus was discovered in Kvemo Kartli Region
- Sero-prevalence study of zoonotic diseases was first time conducted in professional group (veterinarians and farmers) and domestic animals (dog, sheep, cow)
- HIV-Bartonella coinfection has been studied for the first time in Georgia
- For the first-time existence of the New-Delhi metallo- beta-lactamase producing NDM Klebsiella pneumonia and Acinetobacter baumannii strains were established in Achara; it was established that NDM-5 like, ST-395 type strains exist in Georgia
- For the first time in the world Bartonella taylorii has been revealed as a human pathogen
- From PCR positive 4 samples the culture was received in bats of 2 different species. Phenotype of abovementioned bat Brucella species did not match to any previously described Brucella species

Following applied and fundamental biomedical and biotechnological scientific activities were carried out at the NCDC In 2016:

- 88 different programs/projects/grants with 11 components were carried out at the NCDC;
- Joint researches/studies were conducted during the business trips abroad;
- 14 dissertations were conducting by the NCDC staff for obtaining PhD degree. NCDC facilitated in development of 6 academic theses performed by employees of other institutions;
- PhD paper - "Comparative characterization by using of molecular-biological method the drug-resistant and non-resistant (sensitive) strains of Leishmaniosis in Georgia" – is defended to acquire academic degree;
- 53 different types of publications where published by NCDC staff, among them 106 abstracts, 22 research articles, and 12 epidemiological bulletin;
- 3 articles with co-authoring by NCDC staff were published in high-ranked impact-factor medical journal - The Lancet"
- Data used in 6 articles published in journal "The Lancet" was expertised by NCDC Staff.
- In 2016, Center Staff participated and were elected: 1. As experts of the Scientific Committee at the 15th World Congress for Public Health (April 3-7, Melbourne, Australia); 2. As experts/abstracts reviewers and members of conference scientific board at the 2016 scientific conference organized under the Mediterranean Programme for Intervention Epidemiology Training (MediPIET) program;
- 3. As Reviewers of Master's Papers prepared at Tbilisi State Medical University;
- 197 NCDC staff participated in 35 various international conferences / symposiums / congresses.
- 79 NCDC Staff were trained in 48 different trainings abroad in 2016;
- Total 102 interns passed professional trainings at the basis of the center, out of which 14 specialists skilled in practice.

5. Management and Coordination of Public Health Regional Centers

In order to increase the efficiency of Public Health measures, the following activities were implemented in 2016:

- Information was collected on working conditions, human resource capacity at the local/municipality public health centers, status of the implementation of state and municipal programs. The country's "Profile" according to 10 Essential Public Health Operations (EPHOs) under the WHO Regional office for Europe was developed.
- Draft concept for future development of public health system was developed and provided to the WHO Regional Office for Europe.
- For elimination of C hepatitis and prevention of other communicable diseases throughout the country, study/evaluation of existing situation at the facilities of public importance (beauty -, tattoo -, pricing-, acupuncture salons/cabinets) was started with the help of public health municipal services.
- Monitoring of performance of the state program activities by the municipality public health centers was conducted routinely by regional divisions and units.
- Regional laboratory network was playing a significant role in implementing laboratory component of state programs and laboratory surveillance of especially dangerous diseases.
- In the view of commercial laboratory services, total of 452 510 GEL services were performed by the regional laboratories.
- Regional laboratory network was providing active epid-surveillance for fulfillment of "cold chain" Provisions.
- The service together with its structures was actively engaged in educational and communication activities.

Key achievements of 2016

- Active supervision over implementation of the State Public Health programs on local level
- Epid-surveillance of communicable diseases and facilitating active participation of regional and municipal services in determining the causes of the epidemic explosions
- Draft documents for typical models of municipal centers, funding models and schemes of municipal centers for improvement were prepared as well as draft governmental act on public health system development concept
- Evaluation, updating, creation, monitoring, adaptation of standard forms of sampling of existing Standard Operational Procedures (SOP) according to the programs

6. Production of medical statistics

Production of routine medical statistics, analysis and presentation of statistical information: Statistical reports were conducting according to 14 annual, 2 quarterly, 4 monthly reporting paper-based forms and 3 electronic modules. Consolidated sectoral reports were prepared. The data for the WHO databases "Health for All" and "Human Resources" were updated.

New electronic system of supervision of maternal and child health and antenatal and obstetrical services has been implemented throughout the country – **"Pregnant women and newborn health surveillance electronic module"** (so called "Birth registry"), which is one of the key tools for improving the quality of regionalization (contains 11 indicators).

According to the preliminary data of "Birth registry", 2016, 53 732 deliveries (including 23 431 caesarean sections); 24 326 abortions; 53 284 livebirths; 513 stillbirths were registered.

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Key achievements of 2016

- Pregnant women and newborn health surveillance electronic module ("Birth registry") was implemented all over the country
- Transfer of birth / death registration system from the Ministry of Justice
- New case-based electronic reporting system for primary health care facilities was implemented all over the country
- Population based Cancer Register first year data analysis has been performed
- The statistical yearbooks "Health Care in Georgia, 2015" in Georgian and English languages were published
- "Highlights" – short statistical reviews in Georgian and English languages were published
- Publications "Profile of health and well-being" and "Highlights on health and well-being" were prepared under the WHO requirements
- 3 articles were published in „The Lancet“ by NCDC co-authorship

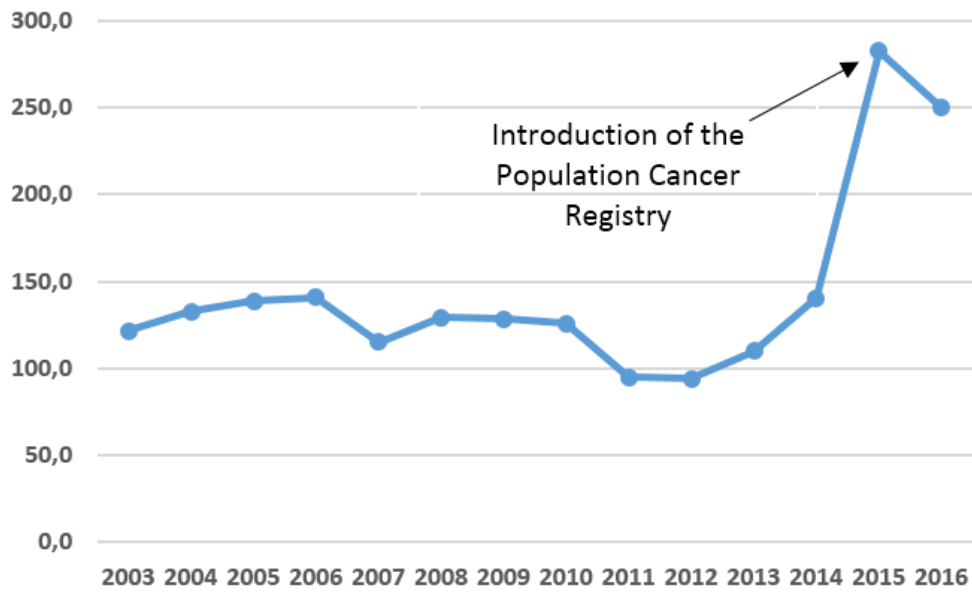
Birth / death registration system management: The Joint Order of the Ministry of Labour, Health and Social Affairs and the Ministry of Justice #01-37/N-137 "On Approval of the Rules for Birth and Death Medical certificates, their Filling and Sending Data from the Electronic Data Base of the State Services Development Agency" was prepared and approved on August, 24, 2016. The old system of the State Services Development Agency was replaced with the birth / death new electronic registration module. Re-trainings of providers were ongoing.

Implementation of the Case-based electronic reporting system for primary health care facilities all over the country: Electronic reporting system for outpatient facilities was elaborated, trainings for statisticians were conducted for all outpatient facilities.

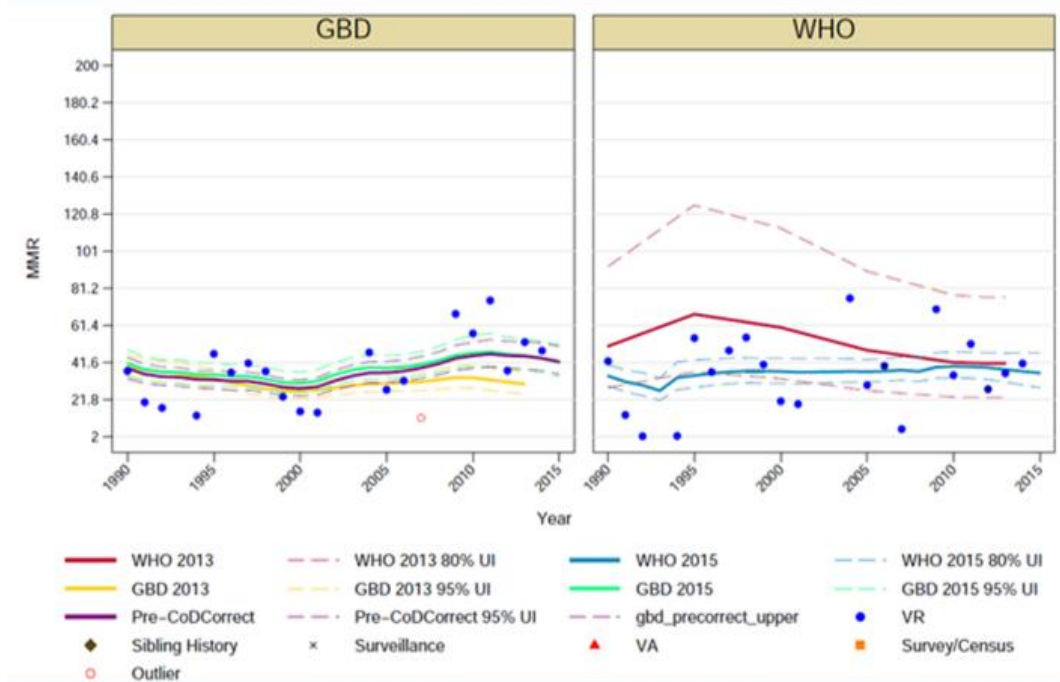
Population-based Cancer Registry: 210 medical facilities, including 36 labs, were involved in reporting system, 19061 forms were received during one year reporting period. Consultations of the personnel, involved in the cancer registration, correction of the reporting forms, and software support was conducted permanently. Cancer Registry 2015 data analysis was prepared and published.

Maternal and child morbidity and mortality: comparison of MoLHSA and Routine Statistical data of Maternal mortality, Neonatal mortality and Still birth has been permanently performed. Activities with UN Inter-agency Group for Child Mortality Estimation and Maternal Mortality Estimation Inter-agency Group (UN-IGME, UN-MMEIG) were carried out.

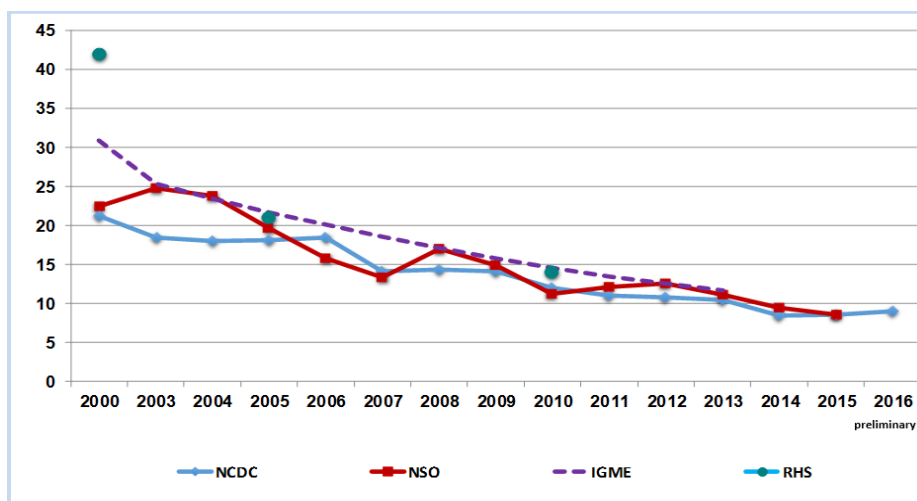
Incidence of cancer per 100 000



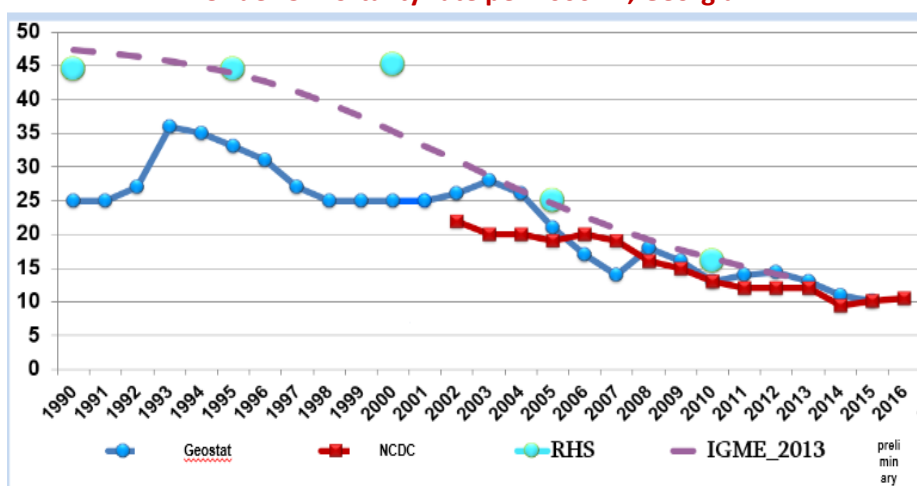
Maternal mortality ratio per 100000 LB, Georgia



Infant mortality rate per 1000 LB, Georgia



Under-5 mortality rate per 1000 LB, Georgia



Collaboration with the Institute for Health Metrics and Evaluation at the University of Washington (IHME):

The Center has provided transfer of Hospitalization and Cancer Registry existing databases. Peer review of 6 scientific publications was conducted. 3 articles were published in „The Lancet“ by NCDC co-authorship.

Participation in the European Healthcare Information Initiative (EHII): The Report and the Operational Framework of the fourth meeting of the organizational group were discussed, participation in 2 webinars took place.

Activities on medical statistical classifications: The updating of medical classifications and its replacement on the informational portal were performed; consultations on medical statistics classifications were ongoing.

Publications: The statistical yearbook “Health Care in Georgia, 2016” as well, as “Highlights” – short statistical review in Georgian and English languages were prepared and published. According to the WHO new initiative, publications “Profile of health and well-being” and “Highlights on health and well-being” were prepared (preliminary versions).

7. Main activities of Health Care State Programs

An important function of NCDC is presented by managing and administering of public health programs. In 2016, 10 state programs directed to health promotion, healthy lifestyle formation and disease prevention were implemented by the Center, these programs promote communicable and oncological diseases prevention. On the one hand providing increase public safety, and on the other hand having important influence on optimization of state expenditures.

- The following programs/components were implemented by the Center: **Early Detection and Screening of Diseases** (breast, cervical, colorectal and prostate cancer screening; Cervical Cancer Screening in Gurjaani; **Early Detection and Screening of Childhood Mental Developmental Disorders from 1 till 6**; **Early Diagnosis and Surveillance of Epilepsy**).

Key achievements of 2016

- Purchase obligations of first-line ART for TB and HIV/AIDS are totally carried over from Global Fund to the Government.
 - Obligation to provide TB bacterioscopy laboratories with consumables are totally carried over from Global Fund to the Government.
 - A new scheme for transportation of sputum/research material has been fully implemented in the country through the "Georgian Post" Ltd
 - Involvement of Beneficiaries of hepatitis C treatment services in to HIV/AIDS screening
 - The coverage area of hepatitis C Screening increased
 - Rural doctors were handed over the equipment to take the Pap test for screening and received opportunity to take the Pap test themselves and refer it to service provider clinic.
 - The donor's unified electronic database was renewed and all the existing blood bank staff were trained in the renewed database operation.
 - Implementation of preventive services against transmissible diseases of the Georgian Black Sea resort zone (Adjara, Guria and Samegrelo regions) started routinely.
 - The Government took responsibility/obligation on influenza surveillance at sentinel sites and expanded the influenza vaccination coverage.
 - Newborn hearing screening area was expanded, The Center was donated with 4 units of hearing screening sets by donor organizations that were transferred to maternity houses in Shida Kartli and Kakheti regions.
 - The geographical access for early diagnosis and surveillance of epilepsy was increased.
- **Immunization** - Strategic procurement and supply management of materials for injection, specific serum and yellow fever vaccines needed for immunization; Provision of anti-rabies vaccine; procurement, storage and distribution of the vaccination materials, anti-rabies vaccine medications, and specific serum in compliance with the "cold chain" principles from the central level through the regional administrative units; Prevention of measles outbreak and unplanned immunological prevention in population with immunodeficiency or incompletely vaccinated population defined by global elimination strategy.
 - **Epid surveillance** - To ensure the work of the medical statistics system, in the administrative units and municipalities; planning of activities for immunization and implementation of logistics in municipalities; Timely detection and improvement of communicable diseases with system-operated work, based on laboratory services.
 - **Safe Blood** - Prevention of transfusion related diseases, provide safety of equal standard for blood products through the country and gradual replacement of paid donations with regular volunteer donation systems.

- **Prevention of occupational diseases** - protection of the health of the employed population through the prevention of occupational and profession-based diseases and promoting safe working environment.
- **TB management** - Epidemiological surveillance; laboratory control; Regional management of TB program; Monitoring; procurement, reception and transportation of first-line TB antiviral drugs cash incentives for improvement of involvement of patients for treatment of Sensitive and Resistant Tuberculosis (with not more than 225 patients per month).
- **HIV/AIDS management** - timely detection of new HIV/AIDS cases, disruption of HIV/AIDS dissemination and ensuring of treatment access for patients with HIV/AIDS.
- **Maternal and Child Health** - Providing tests and consumption materials for the determination of hepatitis B and C, HIV / AIDS and syphilis in pregnant women; newborn hearing screening.
- **Health promotion** - Strengthening tobacco control; Education on healthy diet and raising the awareness about alcohol abuse; Promotion of physical activity; Prevention of hepatitis C and promotion of public education; Health promotion and strengthening.
- **Hepatitis C Screening Program** - The reduction of mortality, morbidity, and spread of infection by providing access of population to the prevention, diagnostics and treatment.

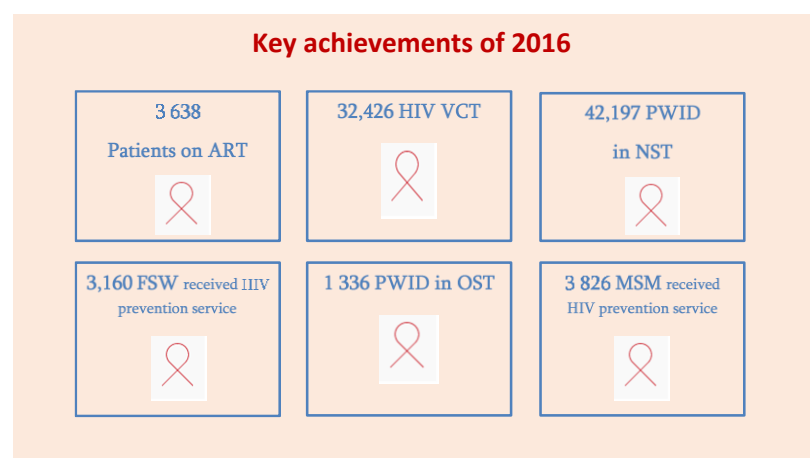
8. Grant Programs supported by the Global Fund to Fight AIDS, TB and Malaria in Georgia

Since 2014 the National Center for Disease Control and Public Health has been implementing the Global Fund’s HIV and TB Programs in Georgia as a principal recipient of the grants.

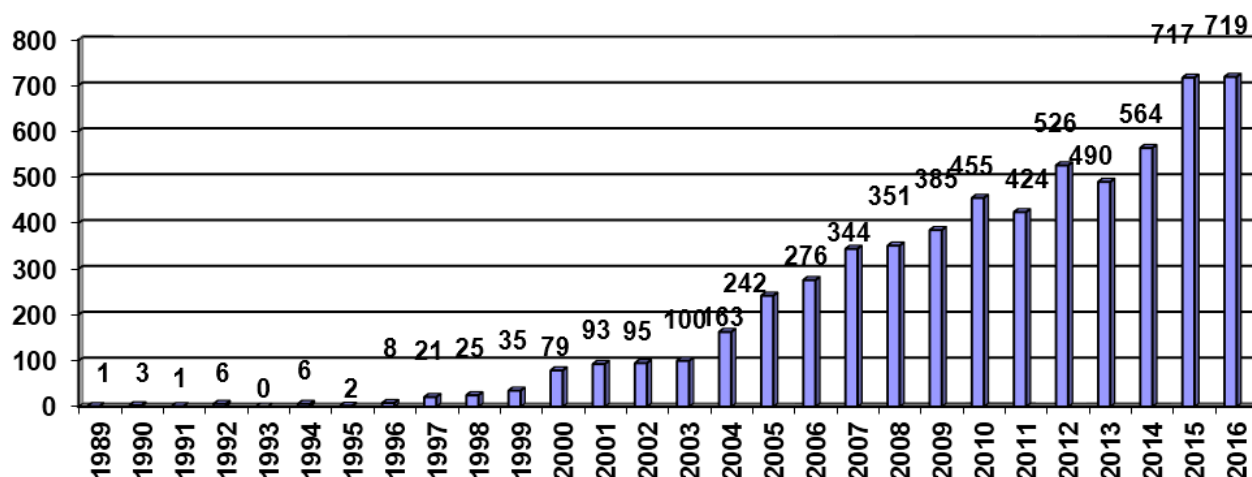
In 2016 the Programs’ Implementation Unit (PIU) of the Center has successfully completed the application and grantmaking processes for the HIV and TB new grants through the Global Funds’ New Funding Model (NFM). A new agreement signed for the NFM grants made the country a recipient of additional 30 mln USD that will ensure sustainability of the Global Funds’ HIV and TB Programs in Georgia for the period of 2016-2019.

8.1 The Global Funds’ HIV Program - „Sustaining and Scaling up the Effective HIV/AIDS Prevention, Treatment and Care in Georgia”

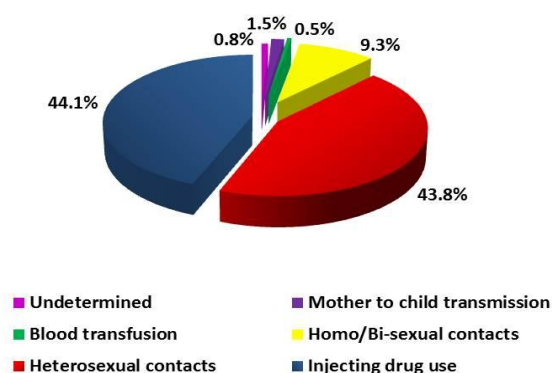
The goal of the program is to improve health outcomes of PLHIV through administration of highly effective antiretroviral treatment and improved care and support services, as well as to turn the HIV epidemic in Georgia in the reversal phase through strengthened prevention interventions targeting at key affected populations (KAP).



Dinamics of Registered annual HIV cases in Georgia



Distribution of HIV cases by the Transmission Routes



Georgia is holding a leading position in the EECA region for providing the universal access to ART for all registered PLHIV. With the Global Funds support and the NCDC's leadership the National AIDS Center (Infectious Diseases, AIDS and Clinical Immunology Research Center) and four regional AIDS Treatment Centers as the HIV treatment implementing organizations were providing ART services to PLHIV in 5 regions of the country: Tbilisi, Imereti, Samegrelo, Ajara and Abkhazia. Also, Georgia has high achievements for ART adherence indicators. In 2016 86% of adult and pediatric patients enrolled in ART were continuing the treatment during the last 12 months.

As in the previous years, in 2016 the NCDC was successfully implementing the HIV prevention interventions targeting PWIDs. The needle and syringe program (NSP) was implemented in 11 cities of Georgia (Tbilisi, Rustavi, Gori, Telavi, Samtredia, Kutaisi, Zugdidi, Poti, Ozurgeti, Batumi, Sokhumi). In 2016 increased coverage of PWIDs was achieved in Methadone (Opioid) Substitution Treatment Program (OST) also. With GF support the OST programs were implemented at 5 centers in 3 cities (Tbilisi, Gori and Batumi). The GF program was supporting the long term methadone detoxification program in two prisons of the country also, namely in Tbilisi and Kutaisi.

In 2016 with NCDC’s and Mental Health and Addiction Prevention Center’s advocacy work the profound change was introduced in the OST program design. From July 1, 2017 the GF OST Program will be fully transitioned to the State Funding and in the State OST Programs the services will be provided free of charge to all PWID patients and beneficiaries will no longer need to co-pay for the services. Removing this financial barrier will improve PWIDs’ access to OST services countrywide.

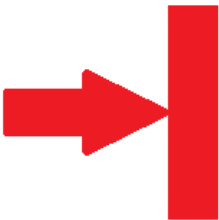
To increase the coverage of MSM population with HIV prevention interventions and to strengthen the LGBT communities in the country by awareness raising on HIV / AIDS and change the risky behavior, 3 LGBT resource centers were operating with the GF program’s support from 2015 in Tbilisi, Kutaisi and Batumi. In 2016 a new resource center was opened in Zugdidi also.

8.2 Sustaining Universal Access to Quality Diagnosis and Treatment of all forms of TB

The program aims to decrease the burden of tuberculosis in the country, by improved treatment adherence and access to timely and quality diagnosis of all forms of TB, including drug resistant forms, through strengthened national program management, coordination, monitoring and evaluation both in civil and prison sector.

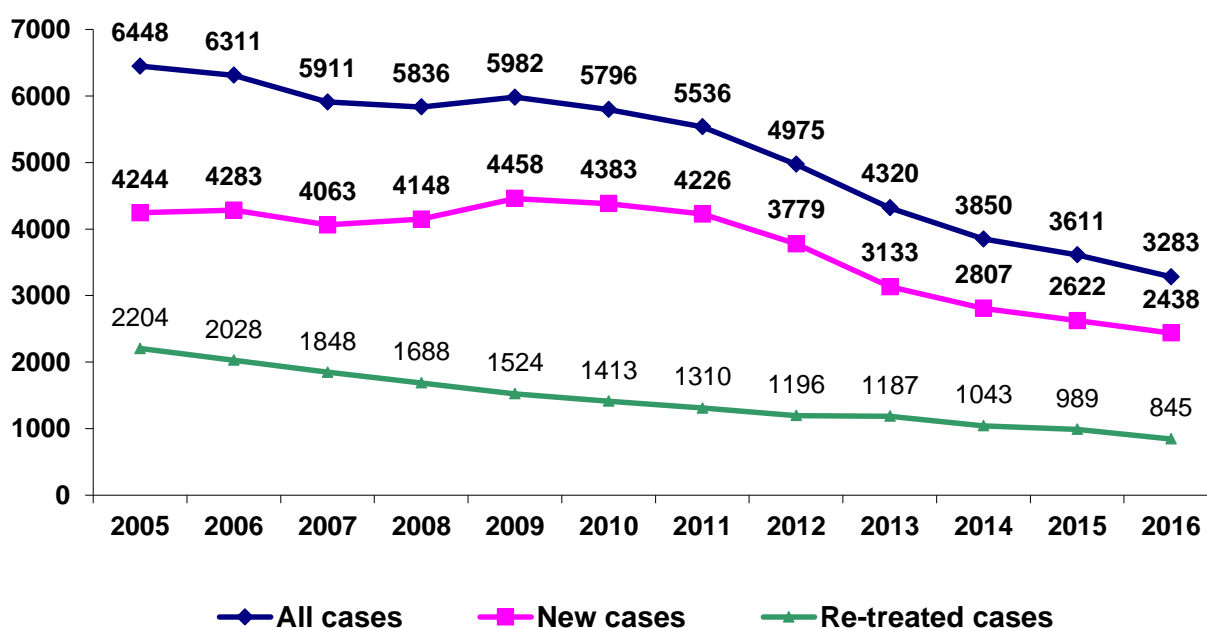
In the last seven years (2010-2016) more than 35 000 TB cases were detected and effectively treated within support of the Global Fund to Fight AIDS, Tuberculosis and Malaria.

Key achievements of 2016



- 85% patients successfully completed treatment
- up to 20 000 individuals were tested for TB
- 3283 patients enrolled in treatment
- 3760 patients received monetary incentive

Case Notification Dynamics in Georgia (by years)

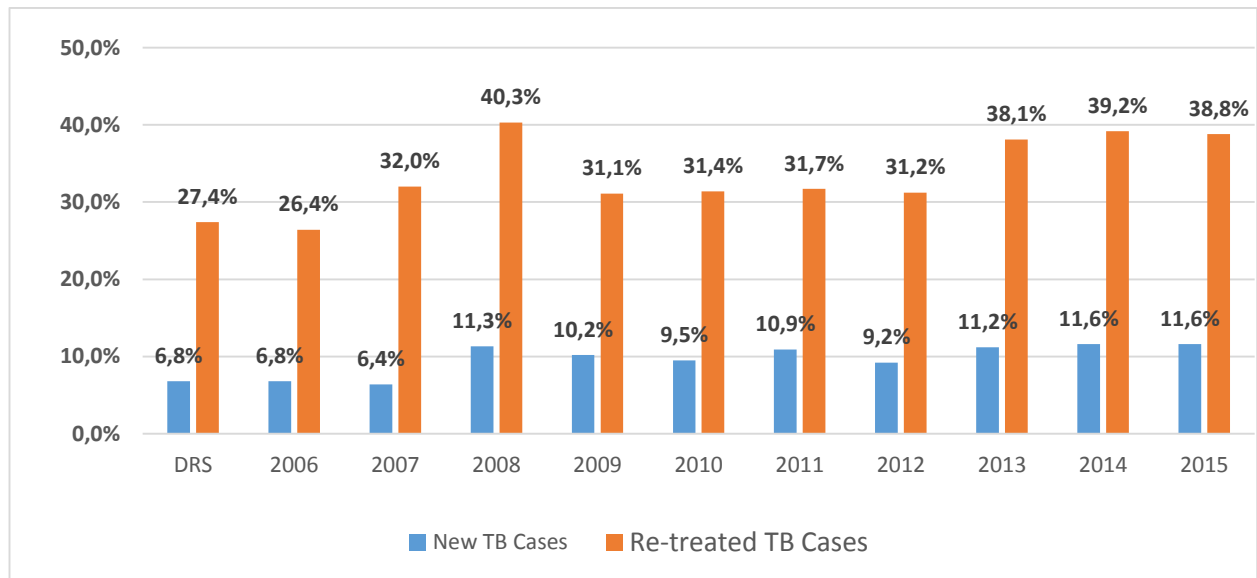


The burden of multi-drug resistant TB in Georgia is high, however, in 2016, 10% of new cases were multidrug resistant, pointing at the minor improvement as compared with the previous year's rate (12%).

The country introduced the modern diagnostic methods approved by the World Health Organization: culture on solid and liquid media, rapid diagnostic methods to diagnose TB and MDR TB and drug susceptibility tests.

GeneXpert MTB/RIF systems for rapid diagnosis of TB and MDR-TB are used throughout the country. Additional 19 GeneXpert machines were purchased in 2016. Sputum samples of 92% of patients diagnosed with TB were tested for first line drug susceptibility.

MDR-TB Forms in New and Re-treated Cases



Access to quality drugs for all TB patients, including resistant forms – access to quality drugs for TB patients implies treatment of sensitive, MDR and XDR-TB patients with first, and second and third line drugs. The first line drugs are purchased with the state budget allocation, the second line drug procurement is supported by the Global Fund. From 2017 the state provides 25% co-funding to purchase second line drugs.

Improvement of treatment completion / treatment adherence rates, through monetary incentives for patients on long-term treatment and introduction of innovative methods of treatment observation, such as video-dot and mobile outpatient units – within the framework of cash incentive schemes, TB and MDR TB patients demonstrating good treatment adherence during out-patient care, receive cash incentives. Patients with multi-drug resistant tuberculosis take drugs for six days in a week under direct observation by a nurse (DOT) in a medical facility. With GF program support these patients receive financial support to cover transportation costs.

Preliminary evaluation of MDR TB cash incentive scheme documented 42% decrease in loss to follow up.

To improve geographical access to medical care for patients on outpatient treatment, in 2016 Global Fund TB Program purchased 3 mobile outpatients units. Since July 2016, innovative pilot project – Video DOT was initiated in Tbilisi.

Improved TB service infrastructure – GF TB program supported construction of the new outpatient TB units.

Strengthening national TB program management, coordination, monitoring and evaluation mechanisms – the monitoring and evaluation group, including 10 regional coordinators and 3 specialists at central level, provide supervision of TB units at district, regional and central levels, and also regional supervision of primary health care facilities; regular monitoring and supervision takes place in the prison sector as well.

Engaging civil sector to raise TB awareness – two projects were implemented by civil society organizations in 2016: providing TB related information to different target groups (including clergy and parish) through educational campaign; within the project frames information materials were developed and communication meetings were conducted in 9 eparchies, after each meeting clerics were selected and trained as peer-educators.

Within the frames of information-communication-education campaign information materials (booklet, flyer, T- shirt, calendar, etc.) were developed, educational seminars were held for journalists in Tbilisi, Kutaisi and Telavi, teachers and students of 25 schools and 6 universities in Tbilisi and regions.

On November 23, 2016 a new grant agreement was signed within the New Funding Model to implement program “Sustaining Universal Access to Quality Diagnosis and Treatment of all forms of TB”.

9. Quality Control

The NCDC’s laboratory Network is a complex system and all its aspects should be oriented to quality assurance in order to achieve common goals regarding quality of patient care and public health programs.

Based on the laboratory assessments carried out by various international experts over the past few years, the absence of quality management system is a major problem for the complete functioning of laboratories.

In 2016, an active work on international standard ISO 15189 was started in the direction of accreditation of the Laboratory of General Bacteriology and Serology of Lugar Center. For achieving this goal NCDC has been assisted by the USA Threat Reduction Program (DTRA) and CDC/Atlanta.

Various activities were implemented with the support of the above mentioned partners:

- Quality Committee established;
- Quality Manager, Document Controller and Quality Coordinators have been assigned;
- ISO 9001 Successfully re-certified;
- Accreditation Scope has been determined;
- IQLS (Integrated Quality Laboratory Services) Lab15189 software has been installed in 15 computers in Lugar Center;
- QMS trainings provided to quality coordinators;
- EQA/UKNEQAS external quality assessment program has been established. 9 EQA PT panels received and tested by General Bacteriology and Serology laboratories in Lugar Center;
- Performed Customer Satisfaction pilot survey (25 respondents from various types of clients);

Key achievements of 2016

- Established Quality Control Unit
- EQA/UKNEQAS external quality assessment program started
- Master SOP and Standard Template of SOP created and implemented
- Quality Manual created
- SOPs written for General Bacteriology, Serology, Reception, Quality Control, Purchasing and Budgeting, HR, Biosafety, Equipment, and other Laboratories
- 63 different forms created and implemented
- Staff Competency assessment of General Bacteriology and Serology Laboratories performed and documented
- Fulfilled Internal Audits in 4 QSE-s
- Mock audit performed and CAPAs planned

- Created and implemented Master SOP and standardized bilingual (Georgian-English) template for SOPs;
- Staff Competency assessment and Performance evaluation of General Bacteriology and Serology Laboratories performed and documented by IQLS (Integrated Quality Laboratory Services) experts;
- Internal Audit of 4 Quality System Essentials has been performed, nonconformities identified and corrective actions planned;
- Management Review has been conducted, fields for improvement identified and corrective actions planned;
- Mock Audit has been conducted by the two international Expert-auditors, nonconformities identified and corrective actions planned;
 - Various types of documents have been developed and implemented:
 - ✓ Quality Manual;
 - ✓ Job descriptions of quality manager, Lugar center manager da quality coordiantors have been created and implemented;
 - ✓ 63 different forms linked to various processes in the laboratory have been developed and implemented.

10. Elaboration of various legal acts and documents

In 2016 NCDC specialists worked on elaboration of various legal acts and documents:

- 15 grant project documentation were prepared and submitted for Government's approval in compliance with the Decree #126 of 14 March 2011 of the Government of Georgia "On Measures to be Taken Related to Grants by Appropriate Institutions of the Executive Authority and by State-controlled Legal Entities of Public Law";
- 22 draft legal acts were prepared in compliance with the regulatory acts and policies on Public Health, to fulfill the terms of EU Association Agreement with participation of relevant consultants;
- 9 draft decrees of the Government of Georgia were prepared and submitted for approval;
- 1 draft resolution of the Government of Georgia was prepared and submitted for approval;
- 2 draft orders and 2 amendments to the draft orders of the Minister of Labour, Health and the Social Affairs (MoLHSA) were prepared and submitted to the Ministry for approval;
- Number of documentations were prepared and submitted to the MoLHSA regarding the import of unregistered pharmaceuticals to Georgia;
- 148 agreements for laboratory investigation were signed and registered;
- 24 agreements for registration of disinfectants were signed and registered;
- Various types of 28 agreements necessary for functioning of the Center were signed and registered;
- In 2016 NCDC received 112 applications for issuing public information that were completely satisfied. There was no request for modifying the public information.

11. Administrative activities

The agreement was signed with Walter Reed Army Institute of Research (WRAIR) and entered into force aimed to the organizational and technical support of the functioning of the Lugar Center.

- New Educational Initiative of British Medical Journal (BMJ) for Georgian Clinicians was introduced - E-Learning Platform for Primary Health Care and Infectious Diseases doctors:
 - ✓ Accessibility to BMJ's largest educational e-resources, 450 individual users are registered;
 - ✓ Establishment of Georgian-language portal, translation of educational modules;

- ✓ Participation in the International Forum on Health Quality and Safety held in Singapore on September 26-28, 2016;
- ✓ Visit to London on November 4, 2016 to the BMJ head office to discuss the ways and possibilities of further expansion of joint cooperation.
- The NCDC Supervisory Board Meeting was held.
- Activities related to the 20th anniversary of the Center (technical and organizational logistics) were implemented.
- Active involvement in the elimination of vaccines deficiency (technical and organizational logistics of visits to Armenia) was performed.
- Organizational and transportation logistical activities were implemented for Hepatitis C screening visits (jointly with patrol police).

Anniversary of the National Center for Disease Control and Public Health

In 2016 the events dedicated to the 20th anniversary of the National Center for Disease Control and Public Health were held: International scientific conference “Public Health and Global Health Security: Vision for Tomorrow”, Expanded Session of the Country Coordination Council for prevention and control of non-communicable diseases; Press conference dedicated to the World Antibiotic Awareness Week; Meeting on National Antimicrobial Resistance Surveillance Network; Visit of Assistant Secretary for Global Affairs of US Department of Health and Human Services - Mr. Jimmy Kolker and liaison officer for Global Affairs office - Ms. Karen Matthews to the Lugar Center of Public Health Research; 12th International Yersinia Symposium; NCDC anniversary ceremony.



Various materials were prepared and published for the anniversary week: Brochure highlighting important milestones over the past years; Thesis book in Georgian and English languages for international scientific conference “Public Health and Global Health Security: Vision for Tomorrow”; Brochure "Scientific and Informational Activities, 1996-2016", 13 Scientific posters and posters reflecting activities of all departments of the Center.

On November 15, 2016 the ceremony dedicated to the 20th anniversary of NCDC was held. The ceremony was attended by the representatives of the government, parliament and various ministries of Georgia as well as representatives of NCDC and medical society. The movie "Twenty Years at Public Health Service" dedicated to the 20th anniversary of NCDC was shown during the ceremony. Photo and video materials were presented. Awarding ceremony was held as well. The NCDC representatives, who contributed to the development of the scientific potential of the Center were awarded.

Awards Received in 2016

On 28 September in regards of the World Day of Public Information L. Sakvarelidze National Center for Disease Control and Public Health was awarded by IDFI and OSGF as the most transparent institution with a special prize for “ Ensuring accessibility to public information in 2016”.

On 13–19 Oct in Barcelona, Spain the WHO organized a training course “ Strengthening of Healthcare Systems through TB Prevention and Treatment Improvement” including a competition among participating countries. Each country delegation selected a concrete healthcare direction and elaborated a modern management tool. The Georgian delegation developed the issues referring discontinued treatment of MDR TB and its unsuccessful treatment. The cause was discussed and a concrete model of management was elaborated. Georgian model won the competition and was awarded with an honorary prize.

Mass Media Relations

- 623 interviews for various TV channels and Internet TV;
- 87 TV programs and 141 TV reports;
- 8 live broadcasts;
- 7 press-club visits;
- 25 radio programs and 32 radio interviews;
- Informational campaigns on Measles-Rubella-Mumps, Crime-Congo Hemorrhagic Fever, Meningitis, Pneumococcal Vaccine;
- 124 internet articles and 623 telephone interviews;
- 26 newspaper articles;
- 17 press-conferences, 5 briefings;
- A documentary movie dedicated to the 20th anniversary of NCDC, 8 posters;
- 28 inspection acts, 28 reports (list, with videos/ photos);
- 5 photo sliders;
- 89 photo albums;
- 2 social internet surveys;
- 114 news and 280 other type of information were posted on the website and Facebook;
- Daily media monitoring;
- 153 answers on the letters and questions posted on the NCDC website and facebook prepared jointly with the relevant departments;
- Daily information and answers on the questions for population and media via "hotline"; Administration of NCDC official website and social networks (Facebook and youtube, myvideo, twitter); Collection, analysis and maintenance of media archive; Daily participation in preparation (submission of materials, selection of respondents) of the program “Med News” of TV Company “Pulsi”.

World Days (Press conferences/briefings): World Rabies Day, World Psoriasis Day, Blood Donor Day, World Cancer Day, World Breast Cancer Day, World TB Day, World Hypertension Day, World Hepatitis Day, World Heart Day, World AIDS Day, World Antibiotics Day, World No Tobacco Day, World Autism Awareness Day, World Health Day.

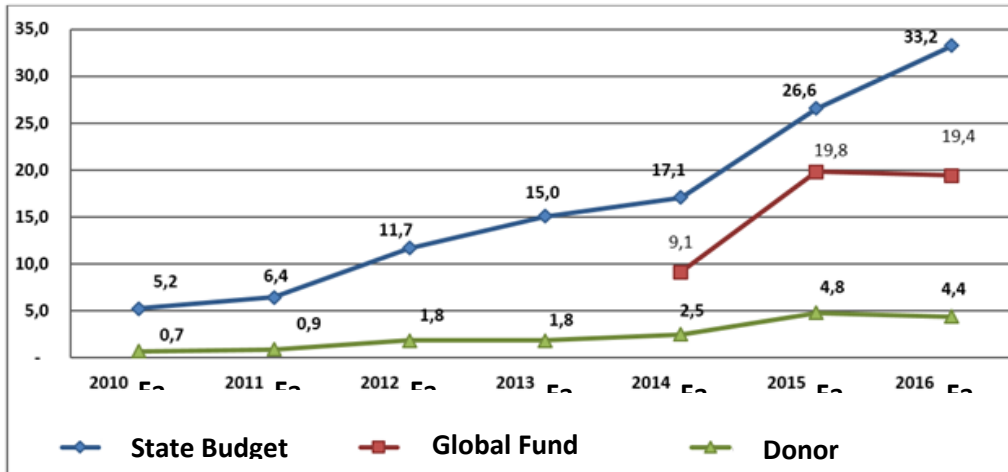
Press conferences/briefings on: Breast cancer prevention campaign, Immunization week, Antibiotic Awareness, AIDS, Viral infections and Influenza epidemiological situation in progress, Diseases caused by Zika virus, non-communicable disease risk factors survey, C hepatitis screening, Crimean-Congo hemorrhagic fever, spread of enteroviral infections.

Weeks: Immunization Week, Breast feeding week, Salt Awareness Raising Week, World Hypertension Week, Lead Poisoning Prevention Week, World Rabies Week, World AIDS Week, C Hepatitis prevention Week, World Breast Cancer Awareness Week.

12. Financial Sustainability of NCDC

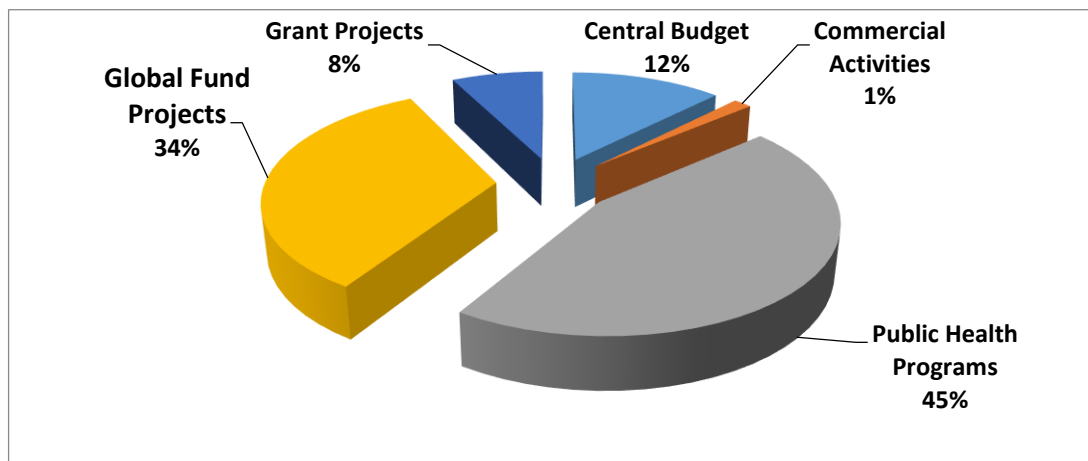
Due to increase of functionality of the Center the central budget allocations have been considerably grown.

Dynamics of Budgeting



Consolidated Budget Performance

Performance of consolidated budget of NCDC for the year of 2016 amounted to 57, 8 million GEL of expenditures, including: 45% of Public Health State Programs, 34% of Global Fund Programs, 12% of Disease Control and Epidemiological Safety Management Program, 8% of Grant projects - financed by donor organizations and 1% of the Center's commercial incomes.



State Budget Allocations

Within the state budget allocations the total sum of implementing programs amounted to 33, 2 million GEL equivalent to 99,8% in terms of percentage.

code	Name of Programs	Approved Plan for 2016	Adjusted Plan for 2016	Actual costs for 2016	Performance %
Total	State Budget	33,168,000	33,311,697	33,250,056	99.8%
01 01	Disease Control and Epidemiological Safety Management Program - 35 01 03	7,260,000	7,188,533	7,187,236	99.9%
02 00	Public Healthcare	25,908,000	26,123,164	26,062,821	99.8%
02 01	Eraly Detection and Screening - 35 03 02 01	2,000,000	1,729,290	1,722,748	99.6%
02 02	Immunization - 35 03 02 02	14,280,000	16,209,548	16,205,693	100.0%
02 03	Surveillance - 35 03 02 03	1,000,000	1,611,797	1,603,729	99.5%
02 04	Safe Blood - 35 03 02 04	1,650,000	1,629,034	1,619,955	99.4%
02 05	Occupational Health - 35 03 02 05	270,000	270,000	270,000	100.0%
02 06	Tuberculosis - 35 03 02 07 02	1,240,000	848,615	845,457	99.6%
02 07	Universal coverage of quality diagnostics and treatment for all forms of Tuberculosis - 35 03 02 07 03	996,000	856,000	837,354	97.8%
02 08	HIV / AIDS -35 03 02 08 02	900,000	726,351	718,680	98.9%
02 09	With a purpose to prevent HIV / AIDS in Georgia to support national response; to improve life indicators through strengthening of treatment and care measures - 35 03 02 08 03	2,630,000	1,044,000	1,043,458	99.9%
02 10	Mother and Child Health - 35 03 02 09 02	542,000	363,534	361,720	99.5%
02 11	Health Promotion - 35 03 02 11	400,000	320,444	319,914	99.8%

Funding by Donor Organizations

In 2016 the amount granted by donor organizations and received in various currencies equaled to: USD – 5 484 670, EUR – 2 268 358, GEL - 228 900, including Global Fund funding - USD 3 518 919, EUR - 2 226 257. Reimbursed through direct payment: USD 648 24; EUR 610 577 –.

In 2016 the NCDC managed 70 projects sponsored by 17 donor organizations an the total amount equaled to 23 754 thousands GEL (including Global Fund - 19 401 thousands GEL, other – 4 353 thousands GEL). Dynamics of expenditure in the framework of several projects is noteworthy for 2012-2016.

Commercial Activities

In the framework of commercial activities the cash revenues amounted to 729, 7 thousands GEL which shows 3 % increase in comparison with 2015; it is also notable that the incomes before 2015 had been increased to 48% in comparison with following years. In 2016 the major part of commercial incomes are presented by the incomes from commercial lab testing that had been increased every year except 2016.

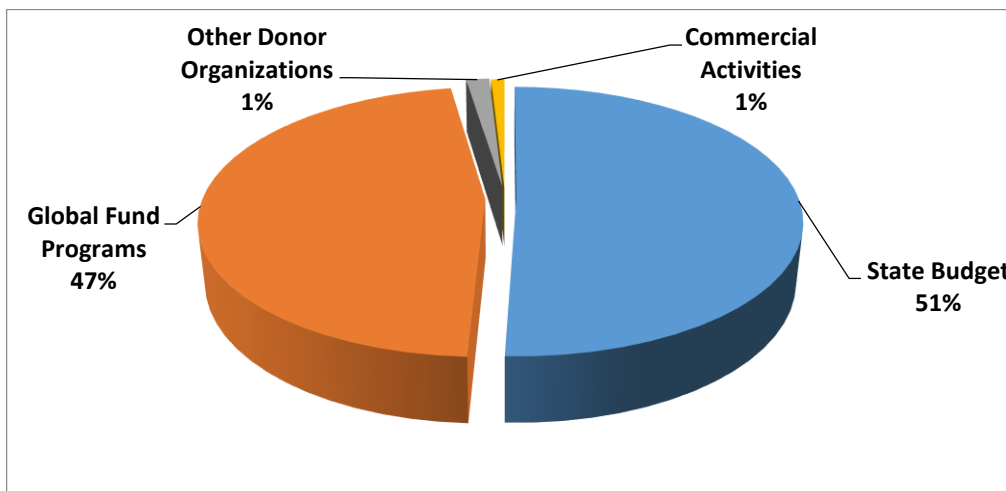
Incomes from Laboratory Testing / Diagnostics for 2013 - 2016

	2013	2014	2015	2016
Income from laboratory testing / diagnostics	312,953.0	347,123.0	584,992.0	504,508.0
<i>Percentage indicator according to years</i>		<i>111%</i>	<i>169%</i>	<i>86%</i>

Procurement

The NCDC's procurement plan for 2016 included 12 sources that are followed as main categories in million GEL:

- State Budget - 28,3;
- Global Fund - 26,1;
- Commercial Activities - 0,5;
- Other Donor Organizations - 0,9.



The largest state procurements for 2016:

- With the purpose to maintain stability in the country the 2 year purchase of hexavalent vaccine was implemented in the framework of Immunization State Program allocations;
- In compliance with the terms of Joint Transition Agreement the NCDC took over the provision of O&M service for the Lugar Center. Due to this commitment 3-year agreement was signed.
- With the purpose to prevent shortage in stocks of Anti-Rabies Immunoglobulin and for timely delivery of vaccine the multiple procurement (for 3 years) was conducted.
- Within the Surveillance State Program and for the preventive measures against the vectors of transmitted disease at the Black Sea coast the purchase of insecticide was conducted.

Accounting Status

At the end of 2016, the total value of assets owned and used by the Center amounted to 237.4 million GEL. The most largest asset is the Lugar Center and its equipment valued at 208, 2 million GEL.

It is noteworthy, that the total value of assets is being increased yearly. In 2016 the values of 6, 6 million GEL were donated by donor organizations.

In 2016, compared to the previous year, creditors' debts was reduced by 174,5 thousand GEL, including salary arrears of 51,0 thousand GEL; debit was increased by 1 935.7 thousand GEL, which is due to the providing vaccines and consumables with the funds transferred from the Immunization State Program account to the UNICEF account as an advance to arrange delivery of vaccines and consumables.

Penalties imposed on violation of terms and regulations of state procurement have been reduced to 104.8 thousand GEL in favor of the budget by the end of 2015 and to 53.9 thousand GEL as of 31 December, 2016.

13. Main Challenges

- Targeted indicator of 95% coverage against all antigens has not been achieved
- Challenges existing in delivering and distributing vaccines and specific serums
- Maintain routine and sentinel surveillance sustainability after donors' withdrawal
- Control of AMR and nosocomial infections
- Financial and technical support for establishment of the Emergency Operational Center (EOC)
- Strengthening capacities for readiness and response to the public health risks
- Multisectoral involvement in the implementation process of the Global Health Security Agenda and International Health Regulations
- Relatively low capacities of entry points with respect to the requirements of the International Health Regulations
- Work on ISO accreditation standards for the Lugar Center
- Completion of biosafety training program accreditation process
- Approval of the standardized documents - modified "Biosafety Guidelines" and "Institutional Biosafety Committee Regulations"
- Establishment of disinfectants study methodology by using of EN standards in the Bacteria and Viruses Repository of the Lugar Center
- Introduction of vectors study modern methodology (genetic barcoding method)
- Challenge in working with anaerobes and various fungus
- Introduction of parasitic study of diarrheal diseases
- Laboratory study of Campylobacteria under the One Health concept
- Start operational Vivarium (BSL-2) module, increase the volume and load capacity
- Strengthening of laboratory capacities, intensify trainings and share experience for better exploitation of LSSs, in order to meet challenges related diseases outbreaks management and good investigation performance
- Improvement of laboratory quality control and standard operating procedures (SOP)
- Assessment of the NCD surveillance to further improvement
- To endorse the amendments to 5 related laws elaborated by the intersectoral State Committee for Strengthening Tobacco Control Measures by the Government of Georgia and to pass them to the Parliament
- Reduction in number of research projects, challenging in obtaining new projects, deficiencies in funding of scientific projects
- Insufficient political support of public health programs and program activities at local level (municipalities)
- Deficiency of public health professionals with appropriate competences and skills on local level
- Statistical data quality (coverage, accuracy); technical capacity (including software) updating / support problems
- Low-coverage rate for screening of target audience
- Development of unified database providing exchange, analysis and tracking of data between screening and treatment bases
- Increase of awareness in population about significance of screening
- Absence of state surveillance and external quality control of blood production
- Minimum license requirement for blood transfusiology and inefficient mechanism of quality assurance (legislative base)
- Low rate of high risk-groups and patients lost from surveillance identified with active findings
- To reach a coverage rate with at least one visit of antenatal care from 100% of pregnant women and at least 4 visits from 90% of the pregnant women
- Establishment of new electronic information system for registration of cases

- Elimination of mother-to-child transmitted infections
- 100% coverage of newborn hearing screening for all newborns in Georgia
- Improve the effectiveness for health promotion by implementing a continuous (discrete) social media campaign
- Absence of linkages between the HIV prevention and treatment database
- Different client registration systems used for registration of PWIDs, FSWs MSM and prisoners within the state and the Global Fund's HIV Prevention programs
- The current drug -policy of Georgia creates barriers for implementation of HIV prevention and harm reduction programs among PWIDs
- The impossibility of rapid expansion of HIV prevention
- Incomplete TB diagnostic modules in health care information system
- High average age of human resources working in TB program (> 60 years)
- High rate (34%) of termination of treatment of multidrug-resistant (MDR) and extensively drug-resistant (XDR)
- Lack of experienced staff on quality management system
- Deficiency / absence updated training courses

14. Main Priorities for 2017

Guidance for 2017 were defined according to the United Nation's Sustainable Development Goals and the strategies of the WHO and the Ministry of Labour, Health and Social Affairs of Georgia.

Reduction of morbidity caused by communicable diseases, disability and mortality

Immunization:

- Increase of immunization coverage rate
- Strengthen coordination between public health and primary health sectors
- Better advocacy and educational work in professionals and general population
- Introduction of pilot project against papillomavirus
- Introduction of influenza vaccination in pregnant women

Surveillance of communicable diseases:

- Maintain sustainability with routine and sentinel bases
- Performance and monitoring of commitments/obligations (surveillance, screening, quality control of laboratory investigation) within the scope of the Hepatitis C elimination program
- Establishment of Surveillance on hepatitis
- AMR and hospital-acquired infections control
- Transmission of Electronic Disease Surveillance System (EDSS)

Performance of the commitments undertaken within the scope of NCDC's competence for the Hepatitis C Elimination program:

- Activating Hepatitis C screening and intensifying educational activities
- Promote introduction of Hepatitis C screening protocol
- Active participation in prevention and control of infections associated with medical / non-medical services along with the Ministry of Labor, Health and Social Affairs
- Activate campaigns aimed at raising public awareness of hepatitis C
- Introduction of hepatitis B vaccine in patients treated with hepatitis C

Readiness and Response to Public Health Risks:

- Emergency operational Center (EOC)
- Approval of GHSA 5-year National Action Plan (Roadmap);
- Monitoring and evaluation of implementation of GHSA National Action Plan
- Approval of national response plan on biological incidents, epidemics / pandemic
- Development and approval of NCDC risk communication plan
- Organizing an international meeting on real time surveillance action packages

R. Lugar Center for Public Health Research:

- Work on ISO accreditation standard
- Introduction of national external quality control
- Prepare SOPs according to ISO standard
- Work standardization
- Establishment of Hepatitis Reference Laboratory
- Introduction of resistance study on routine base by using of molecular methods
- Strengthening the new generation sequencing in the direction of human genome study
- Completion of biosafety training program accreditation process
- Study of *Y.pestis* molecular epidemiology and ecology on the endemic territories of borders in Georgia and Azerbaijan
- Assessment of transmission risk for invasive infectious diseases associated with rodents in the Black Sea coastal areas in Georgia and Ukraine
- Prepare Georgian Atlas of Zoonotic Diseases
- Strengthening control / preventive measures of IDPs natural foci and adjacent areas
- Introduction of parasitic study of diarrheal diseases, anaerobes and fungus
- Laboratory study of *Campylobacter* under One Health concept
- Start operational vivarium (BSL-2) module in the Lugar Center

To decrease NCD related morbidity, disability and mortality

NCDs and risk-factors surveillance:

- NCDs and trauma global and national prevalence assessment, surveys, registries
- Advocacy to endorse NCD strategies and action plans
- Development of the nutritional sentinel surveillance
- Presentation of the STEPS survey report

Maternal and Child, Adolescent Health, Reproductive Health:

- Reproductive age women, maternal and child health tendency analyses
- Assessment of maternal and child health risks and determinants
- Pregnancy and antenatal care data analyses
- Reproductive age women mortality surveillance
- Under 5 mortality surveillance
- Working on the antenatal mobile application and web-page
- Elaboration of the Perinatal Report
- Maternal Mortality in-depth analyses

Health Promotion:

- Working on the Health Promotion Strategy and its presentation
- To complete the KAP survey analyses
- To elaborate and implement the Healthy Cities project
- Elaboration of educational materials
- Functioning of tobacco "QuitLine"

Tobacco:

- Working towards accomplishing the Tobacco Control Action Plan directions
- Implementation of the project “Supporting endorsement and enforcement of strengthened legislation on tobacco demand reduction in Georgia in order to meet WHO FCTC requirements”
- Implementation of the Tobacco cessation mobile application
- Advocating the new amendments of the laws

Surveys/Projects:

- Child Marriage Qualitative Survey
- Participation in MICS
- Global Youth Tobacco Survey (GYTS)
- Iodine National Survey (UNICEF)
- TEMPUS project
- Strengthening of micronutrients deficiency surveillance systems (GNMSS)

Environmental Impact and Behavior Risk-factors Assessment and Correction for Improving Georgian Population’s Health

- Implementation of EC-Twining Project "Developing Health System in Georgia";
- Development of legislative and operational framework for hazardous chemical substances;
- Preparation of Certified Training Course "On Management of Medical Waste";
- Elaboration of the draft document "Black Sea coastal states' unified cooperation".

Development of Applied and Fundamental Bio-medical and Bio-technological Research capacity

- Development of applied and fundamental bio-medical and bio-technological research potential
- Submission of new research projects;
- Human resources recruitment and capacity development;
- Strengthening of Lugar Center management;
- Establishment of new testing methods and approaches.

Management and Coordination of Public Health Regional Services

- Promotion and prioritization of development of public health preventive medicine in Healthcare System.
- Farther development of public health, hospital sector and PHCs on the basis of public-private partnership;
- Activation of community movement - “For Healthy Georgia” on the level of primary healthcare and in interaction with community.

Production of medical statistics

- Enhance of data quality;
- Maintenance of birth / death electronic system;
- Conduct preparatory activities to implement under 5 children supervision system in the “Birth registry”;
- Transfer Cancer Registry into electronic-based model;
- Participation in the process of improving the quality of causes of death;
- Calculation of the morbidity and mortality indicators for variety of diseases, maternal and child health, their comparison with other countries indicators, identify trends, calculation of 2020 indicators, etc.;
- Completion the WHO databases;
- Cooperative activities in the frame of the Memorandum of Understanding between the NCDC and IHME;
- Preparing and publishing various publications.

Management of the State Healthcare Programms

- Implementation of a state surveillance and quality control system of blood production within the framework of the Safe Blood Strategy approved by the Government of Georgia No1704 in August 18, 2016;
- Carry out the necessary measures with full coverage of hearing primary screening surveys for all newborns in Georgia;
- Elaboration of schemes which stimulates to the resulting funding model and priority services (such as immunization, screening, etc.) in order to increase the efficiency of preventive programs for the primary health care;
- Improvement of the electronic information system for TB cases registration through implementation of TB diagnostic module.

The Global Fund Programs

HIV/AIDS

- Expanding the HIV prevention package and HIV VCT services for Key Affected Population (KAP) groups, initiation of syphilis treatment programs for PWIDs;
- Development of HIV prevention program database and its integration with AIDS Treatment and hepatitis C screening program databases;
- Initiation of a pilot Pre-exposure prophylaxes (PrEP) treatment program for HIV prevention among MSM and ensuring sustainability of ART among PLHIV;
- Conducting IBBSS surveys among PWIDs and FSWs;
- Implementation of HIV stigma reduction information media campaign;
- Integrating hepatitis C elimination program activities in the harm reduction programs of PWIDs

Tuberculosis

- Improvement of TB treatment adherence through involvement of community-based multidisciplinary team;
- Monitoring of TB treatment adherence;
- Development of mobile application for Video Observed Therapy (VOT);
- Implementation of TB-ECHO project in 5 regions of Georgia;
- Anti-stigma educational campaign in targeted groups of population.

General Partnership

- Expanding the partnership worldwide, supporting fund raising for the development of the Center
- Improvement of quality management
- Enhancing IT capacities (including the human resources) and renewal / strengthening of the technical capacities
- Monitoring of construction the new building of the Center, establishing strong campus together with the Lugar Center.