



MINISTRY OF INTERNALLY DISPLACED
PERSONS FROM THE OCCUPIED
TERRITORIES, LABOUR, HEALTH AND
SOCIAL AFFAIRS OF GEORGIA



დაავადებათა კონტროლისა და
საზოგადოებრივი ჯანმრთელობის
ეროვნული ცენტრი

GEORGIAN NATIONAL CENTER FOR DISEASE
CONTROL AND PUBLIC HEALTH

GEORGIA Brief 2020

Richard Lugar Center for Public Health Research

Richard Lugar Center for Public Health Research is a brand new facility under the National Center for Disease Control and Public Health (NCDC), which became operational in August 2013. The Lugar Center is top- tiered institution in NCDC's system. Establishment of the Lugar Center took start in 2004, after USA – Georgia Agreements were signed (in 1997 and in 2002) on cooperation in the area of prevention of proliferation of technology, pathogens and expertise related to the development of biological weapons.

Based on those agreements, For more than ten years, USA provided significant financial and technical assistance in the area of Human and Animal Health and Biosafety. Cooperative Biological Engagement Program (CBEP), implemented by the US Defense Threat Reduction Agency (DTRA) supported renovation laboratory networks with modern biosafety features, for detection of Human and Animal pathogens. Significant resources were invested into personnel training as well.



Key findings

The Lugar Center consists of modern BSL-2 and BSL-3 laboratories, with emphasis to timely detection and identification of human and animal pathogens based on the One Health concept. This Biosafety Level 3 (BSL-3) facility houses bacteriology and virology laboratories, and the National Repository of human and animal especially dangerous pathogens (EDPs).

The BSL-3 facility is unique not only to Georgia but the entire Caucasus Region. Strains of infectious disease causative agents, including EDPs, are stored at NCDC's Bacterial and Viral National Repository. The history of the repository has begun since the '60s of the last century when the live "culture museum" of the Georgian APS received two strains of *V. cholerae asiatica* (OGAWA).



The Biosafety Level 2 (BSL-2) space encompasses several laboratories: Bacteriology, Virology, Serology, Molecular Biology / Genomics, Cell Culture, Parasitology, and Entomology.

The Center also includes the well-equipped genome center equipped with Illumina MiSeq, MiSeq Dx (FDA approved for clinical applications) and NextSeq platforms, which makes it a unique sequencing facility in the region.



There are several laboratories at the Lugar Center which are accredited by international organizations. These laboratories regularly participate in evaluations of professional competence. The quality control activities of NCDC's Polio, Influenza and Measles/Rubella Laboratories are accredited by the World Health Organization (WHO). Four Labs are connected to WHO Lab Network: Rota, Invasive Meningitis, Malaria, Salmonellosis.

Participation on WHO Laboratory Networks:

- 2001 - Participation on Global Salmonella Network, Salmonella Global Investigation External Quality Assessment Program.
- 2002 - Measles/Rubella National Laboratory Participation in WHO Europe Network
- 2003 - Laboratory of poliomyelitis and other enteroviruses is fully accredited by WHO and has been a part of the WHO Global Polio Laboratory Network
- 2006 - Rotavirus group became the member of the WHO/EURO Rotavirus Laboratory Network
- 2007 - Recognition of National Influenza Center (NIC) by the WHO
- 2010 - Integration into the WHO Invasive Meningitis Network and participation in EQA Program
- 2014 – Join to CAESAR AMR network

Currently the Lugar Center is in the process in obtaining the status of WHO Collaborating Center in AMR.

Recent Key Achievements

- During COVID-19 pandemic Lugar Center was the first who started detection of this virus in the country in February 2020. Today, more than 30 labs are involved in the testing. The capacity of the laboratory was significantly increased with high throughput equipment including Cobas-6800 from Roche.
- Lugar Center is involved in EQA from international donors: with WHO funding the panel was received from CAP as for NCDC as well as for 19 other labs. In addition, the EQA program created for Hep C was adopted for the labs involved in SARS-COV-2 detection and they receive the EQA panel reated at Lugar Center on regular base.
- Biosafety trainings were conducted for medical personnel. Laboratories were evaluated with site visits.
- The culture of SARS-COV-2 was successfully isolated in BSL-3 facility.
- SARS-COV-2 was detected in sewage water
- The antibody testing is ongoing for seroprevalence study of the population as well as for evaluation of neutralizing antibodies in SARS-COV-2 positive patients.
- Under scientific study 21 full SARS-COV-2 genomes were obtained from clinical samples using Next Generation Sequencing (NGS) technology and uploaded to GIS database. Sequencing of more samples is ongoing.
- In the scope of the international project samples of the bats from Georgia, Turkey and Azerbaijan were investigated. 25% was positive for coronaviruses and using sanger sequencing alpha and beta coronaviruses specific for the bats were identified.
- With funding of the Global Fund were procured automatic systems Procleix Panther from Grifols that are used for molecular testing algorithm under blood safety programs.
- NGS clinical application is for testing oncology patients on BRACA markers.



At present NCDC / Lugar Center has implemented more than 160 international scientific and public health projects within ~ 36 000 000 USD.

On the basis of the Lugar Center the following scientific achievements were made:

- New species of Orthopox virus discovered (so called Akhmeta virus);
- Brucellosis and leptospirosis pathogens were found in bats;
- *Bartonella taylorii* was detected as a human pathogen in patients

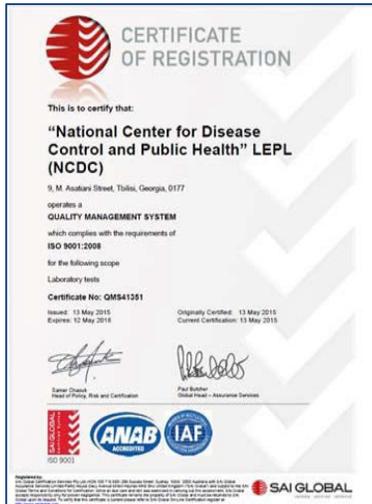
with HIV / AIDS; *Janibacter hoylei* PVAS-1 was separated from endocarditis clinical sample.

- Cultivation and molecular detection of *Campylobacter* was implemented.
- Molecular detection of more than 200 antibiotic resistant strains was performed. Most widely spread resistant genes were identified: CRO, sul, Kpn, MBL, dfrA, TEM, NDM, KPC, OXA.
- The isolated resistant strains were sequenced and data used for improvement of surveillance activities.
- Information on AMR was processed and published on the CAESAR network
- Cowpox detected in Samegrelo region
- The Results of the suspected but unconfirmed samples 41% of anthrax turned out to be caused by the viral infection of Parapox
- Sequencing and analysis of *Y. enterocolitica* was performed to study ecology of *Y. pestis*
- Viral pneumonia cases after bacterial research / molecular method were found to be positive for bacterial etiology on *Streptococcus pneumonia*
- Anthrax in soil active foci detection increased to 15% (10% historically). Correspondently, increased the risk of disease in animals, as well as in humans
- Tularemia unknown foci was detected in Kvemo Kartli and Imereti
- *Cl. difficile* was isolated from clinical samples
- Leptospirosis species were identified in the country and cultures isolated
- Molecular detection of *Escherichia coli* (STEC) toxigenic markers (stx1/stx2/eae/Ehly) were implemented into

the routine

- *Salmonella* spp., *Shigella* spp. and toxin producing *Escherichia coli* (STEC) genetic profiles were identified using the pulsing field gel electrophoresis (PFGE) for the detection and analysis of the source of an outbreak
- Sequencing capacity of measles / rubella was introduced and revealed circulating of the measles genotype D8
- New serotypes of *Salmonella* and *Shigella* have been found
- With the help of GIS applications (such as GARP (Genetic Algorithm for Rule-set Production)) it became possible to create prediction models to study ecology of different vectors;
- Established Global hepatitis Outbreak and Surveillance Technology (GHOST) center for Hepatitis C surveillance

NCDC was awarded “Quality Management System” (in the area of laboratory examinations)



International Standard ISO 9001:2008 certification in 2015.

Lugar Center for Public Health research has been assessed by ANAB according to the requirements of international standard ISO 15189:2012 while demonstrating technical competence in the field of Medical and Clinical Laboratories and received the Certificate of Accreditation No. AM-2542 in Clinical Bacteriology and Serology.

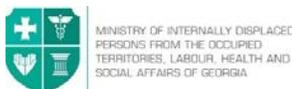


Lugar Centre is a Regional Training and Resource Center (RTRC) in biosafety, biosecurity and Laboratory management in the South Caucasus. Lugar Center is ready to provide trainings for our international partners from former Soviet Countries as well as other countries of the region. There were training sessions for Kyrgyz and Turkish scientist within collaborative projects.

As the country’s NPHRL, Lugar Center established a National EQA Programs in hepatitis C and bacteriology (AMR). In 2017, Lugar Center launched national EQA program by sending PT panels and required documents to all laboratories listed in the Hepatitis C registry. Since 2018 all bacteriology laboratories throughout the country are receiving the Proficiency Testing Panels (PT) on AMR.

Challenges and Future Steps

The Lugar Center will serve as the main reference laboratory for public health in Georgia and Provide subject matter expertise in a broad range of disciplines such as, but not limited to, pathogen research methods and technologies, clinical infectious diseases, clinical research methods, bio surveillance, biosecurity, biosafety, medical product development, grant writing training, facility operations, equipment and facility maintenance, and research marketing.



Ministry of Internally Displaced Persons from the Occupied Territories, Labour, Health and Social Affairs of Georgia
144, A. Tsereteli avenue, Tbilisi, Georgia, 0119
www.moh.gov.ge



National Center for Disease Control and Public Health
99, Kakheti highway, Tbilisi, Georgia, 0198
www.ncdc.ge

საქართვების კონტროლისა და
საზოგადოებრივი ჯანმრთელობის
ცენტრი
GEORGIAN NATIONAL CENTER FOR DISEASE
CONTROL AND PUBLIC HEALTH