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REGIONAL OFFICE FOR Europe

Better Labs for Better Health
Second Partners' Meeting, December 2016
Report

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Acknowledgments

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Abbreviations

CBRN – chemical, biological, radiological and nuclear risk
CDC – Centers for Disease Controls and Prevention
CLC – Coordination Laboratory Council
ELI – European Tuberculosis Laboratory Initiative
EQA – external quality assurance
ERLTB-NET – European Reference Laboratory Network for Tuberculosis
FIND – Foundation for Innovative New Diagnostics
GLI – Global Laboratory Initiative
IHR – International Health Regulations
ISO – International Organisation for Standards
LQSI – laboratory quality stepwise implementation
MDR-TB – multidrug-resistant tuberculosis
MoH – Ministry of Health
NCDC – National Centre for Disease Control and Public Health
NLP – national laboratory policy
NLSP – national laboratory strategic plan
NLWG – national laboratory working group
QMS – quality management systems
RDC – Republican Diagnostic Centre
SLMTA – Strengthening Laboratory Management Through Accreditation
SOP – standard operating procedure
SWOT – strengths, weaknesses, opportunities and threats
TB – tuberculosis
WHO – World Health Organisation

Executive summary

The Better Labs for Better Health initiative aims to help Member States (to date, primarily Kyrgyzstan, the Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan) to meet their commitments under the International Health Regulations (2005) (IHR) to respond to health emergencies by strengthening laboratory services.

The initiative contributes to this by supporting both development and implementation of national laboratory policies and strategic plans through a participatory process that includes all relevant sectors and institutions, and bottom-up improvements to the quality and safety of laboratory services through training and mentoring.

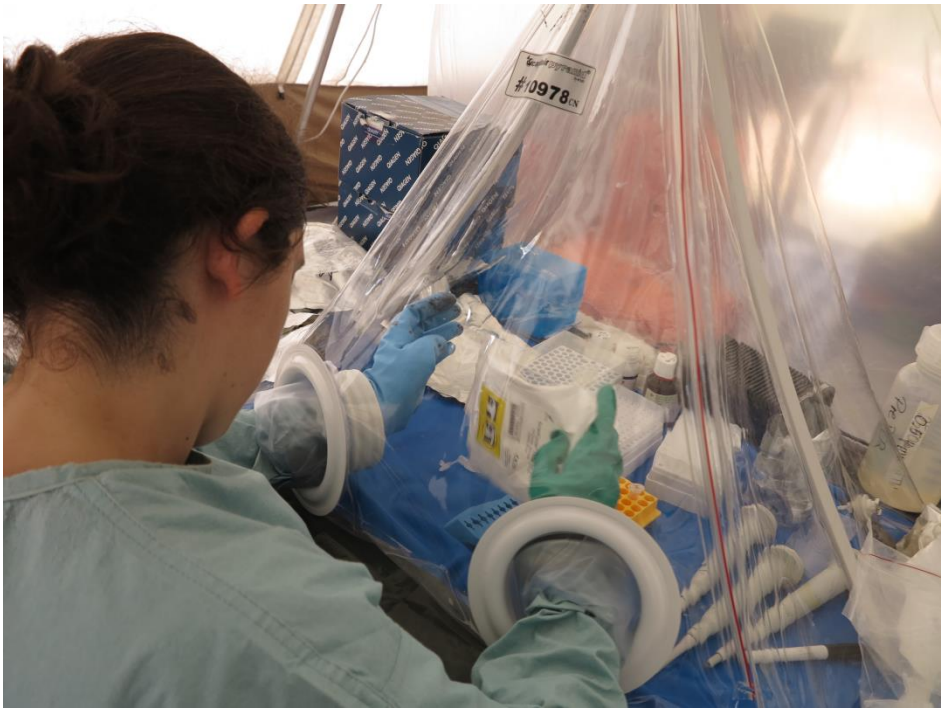
The 2nd Partners' Meeting reviewed progress in these areas since the 1st Partners' Meeting in June 2014. The mentoring project for implementation of laboratory quality management systems was presented, and various models of public health laboratory systems were presented and discussed. The meeting also included a joint session with the European Tuberculosis Laboratory Initiative (ELI) to present the ELI and its TB laboratory maintenance plan. In addition, the meeting aimed to widen the initiative's audience, identify best practice models, and provide a forum for countries working to strengthen their laboratory services.

Key conclusions from the meeting were:

- Countries that have developed national laboratory policies and strategies have made significant steps towards improving their laboratory systems.
- A top priority is to improve the regulatory framework pertaining to the licensing and accreditation of laboratories, and a number of countries have made important progress.
- National Laboratory Working Groups in the five primary countries are a key resource for providing expertize and advice to governments, partners and donors regarding laboratory system strengthening.
- There is a need to develop case studies and guidance on public health laboratory systems for countries in the process of reform.
- The laboratory quality mentoring project is proving its worth and should be continued.

Background

Well-functioning, sustainable laboratory services, operating according to international principles of quality and safety, are an essential part of strong health systems, are crucial to improving public health, and are in the front-line in the response to health emergencies. The analyses that laboratory services provide offer a reliable foundation for the evidence-based prevention and control of diseases and outbreaks, surveillance of antimicrobial resistance, robust surveillance of adverse events associated with pharmaceutical or vaccine use, earlier treatment of both acute and chronic diseases, and safeguarding the quality of drinking-water.



In 2012, the WHO Regional Office for Europe launched the Better Labs for Better Health initiative to fundamentally improve laboratory services in Member States in eastern Europe and central Asia, including building the capacities required under the International Health Regulations (2005) (IHR) to respond to health emergencies.

The initiative builds on the premise that sustainable laboratory services require a rational approach to laboratory system strengthening as well as government and donor commitment. This is achieved through the development and implementation of national laboratory policies and strategic plans by formally designated national multisectoral laboratory working groups. Coupled with improvements to the quality and safety of laboratory services through training and mentoring of laboratory managers in the implementation of laboratory quality management systems, improvements are made both from the bottom up as well as top down.

Much has been achieved since 2012, with the development of laboratory policies and strategies in Kyrgyzstan, the Republic of Moldova, Tajikistan and Uzbekistan, and work started in Turkmenistan. Reviews of national teaching curricula for laboratory staff have also been undertaken in those four countries. Training in laboratory quality has been provided to 135 laboratory professionals from 23 countries and dedicated mentors in quality systems implementation support eight laboratories in six countries, with ISO 15189 accreditation as the ultimate goal.

The 1st Partners' Meeting on the Better Labs for Better Health Initiative, was conducted jointly with the Centres for Disease Control and Prevention in Atlanta and the HIV/AIDS team of WHO Regional Office for Europe, and took place in Copenhagen, Denmark, in June 2014.

This 2nd Partners' Meeting reviewed the work of WHO, countries and partners in the area of laboratory system strengthening towards implementation of the IHR (2005), public health laboratory functions and models, along with laboratory quality and biosafety, placing activities in the context of the new WHO Health Emergencies Program. It also included a joint session with the European Tuberculosis Laboratory Initiative (ELI), which focused on the development of an Essential Laboratory Maintenance Plan.

The ELI aims to strengthen tuberculosis (TB) laboratory capacity in the WHO European Region, with a particular focus on the 18 countries in the Region in which addressing TB is a high priority. The ELI was set up in 2012 by the WHO Regional Office for Europe and the Global Laboratory Initiative (GLI) to strengthen laboratory capacity for TB and multidrug-resistant TB (MDR-TB) across the WHO European Region. WHO/Europe hosts the ELI Secretariat. ELI members are from national and supranational TB laboratories in the European Region and international partners, who collaborate to accelerate and expand access to quality-assured TB diagnostic services.

Key achievements presented included:

- the technical briefing at the WHO Regional Committee 66 on Health laboratory strengthening through the Better Labs for Better Health initiative as an essential component of early warning surveillance and response systems and a national core capacity of the IHR;
- the launch of the WHO/Europe laboratory services website;
- collaboration with the European Centre for Disease Control and Prevention's National Microbiology Focal Points;
- participation in meetings including the WHO Regional Office for the Eastern Mediterranean 2nd intercountry meeting of the Directors of Public Health in Oman;

- publication of the first Better Labs for Better Health activity report, 2013-2015.

Objectives

The meeting set out to achieve the following objectives:

- present the results of the Better Labs for Better Health initiative from 2012 to the present;
- bring WHO guidance, tools and teaching curricula in the area of disease-specific (TB) and general laboratory quality and laboratory system strengthening to the attention of a wide audience;
- discuss best practice models for public health laboratory services implementation;
- provide a forum for countries working to strengthen their laboratory services to share expertise, experience and lessons learned; and
- enhance interaction among countries, partners and donors in the area of laboratory quality strengthening;
- present the ELI and its outputs;
- present the ELI TB Laboratory Maintenance Plan and to assess the countries needs and gaps during a working group session.

Session 1: Laboratory strengthening activities through the Better Labs for Better Health initiative and its partners

During the first session, an overview of activities undertaken by the **Better Labs for Better Health initiative** was presented at the country and regional level. The Better Labs for Better Health initiative began with a focus on capacity-building and partnership through national laboratory working group (NLWG) establishment, and national laboratory policy and strategy development and implementation. Current areas of work being implemented include quality management systems (QMS) training and mentoring, and curriculum development activities.

The five countries that have adopted the Better Labs for Better Health initiative – Kyrgyzstan, the Republic of Moldova, Tajikistan, Turkmenistan and Uzbekistan – presented the work which has been done to strengthen laboratory services in their countries, after which three partners described laboratory strengthening activities undertaken by their organisations.

Country work through the Better Labs for Better Health initiative

The NLWG in **Kyrgyzstan** was formalized as the Coordination Laboratory Council (CLC) in January 2015, with powers defined by a Ministry of Health (MoH) order. The CLC worked on laboratory policy and strategy development, using the approach followed by all five countries as outlined in WHO best practices documents on national laboratory policy and strategy

development[1] Laboratory services were assessed by the Centres for Disease Control and Prevention (CDC) and WHO, and a SWOT analysis of the laboratory system was done. The organisational structure was described in detail, a registry was made of laboratories, and the existing regulatory framework pertaining to licensing and accreditation was described. Based on this information, the CLC defined 11 priority topics for the national laboratory policy (NLP) and strategic objectives for national laboratory strategic plan (NLSP), which was endorsed by MoH in 2016 as the National Programme for the Development of Laboratory Services of the Kyrgyz Republic[2]. Future plans include work on a budgeted action plan corresponding to the policy and strategic plan, along with estimation of the economic efficiency for optimization and rationalization of laboratory services. This will be complemented by review of the licensing system, update of the corresponding regulatory framework and development and implementation of pre and post-graduate training programmes for laboratory staff.

The **Republic of Moldova** explained its legal framework for laboratory services, including the Public Health Action Plan 2014-2020. This led to a reform of the public health laboratory network from 36 district laboratories to 10 regional laboratories. The NLWG was established in 2012, developing a draft NLP and NLSP plan, which led to policy dialogue and development of National Health Laboratory Policy visions and focus topics. The laboratory training curriculum was reviewed and developed, and WHO leadership and management modules are being integrated into the national Masters of Public Health programme. The next steps include completion of the curriculum review process which will lead to the inclusion of a module on Laboratory Management in the Master of Public Health curriculum, and national approval of the National Health Laboratory Policy.

Following the establishment of the NLWG in 2012, **Tajikistan** developed 12 policy topics in four areas, identified through strengths, weaknesses, opportunities and threats (SWOT) analysis, which were compiled in a draft NLP. The next steps include obtaining Government of Tajikistan approval for a resolution on the reform of laboratory services, based on the NLSP, which is currently being finalized. Work will then begin on harmonization of legislation with international policies and regulations.

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[1] http://www.euro.who.int/en/health-topics/health-policy/health-2020-the-european-policy-for-health-and-well-being/publications/2017/development-of-national-laboratory-policies.-best-practices-document-and-facilitators-guide-2017

http://www.euro.who.int/en/health-topics/health-policy/health-2020-the-european-policy-for-health-and-well-being/publications/2017/development-of-a-national-laboratory-strategic-plan.-best-practices-document-and-facilitators-guide-2017

Turkmenistan described its national laboratory structure, and the training and support provided by WHO on virology and quality management systems, which include preparation for QMS mentoring. The NLWG was established by the Ministry of Health and Medical Industry in 2016, and the NLP and NLSP and currently under development, with the SWOT analysis undertaken, and policy topics developed. Future plans include endorsement of both documents by the Ministry of Health and Medical Industry.

Uzbekistan described activities carried out through the Better Labs for Better Health initiative, such as its NLWG establishment, NLP and NLSP development, and work on curriculum review and development. The national regulatory and legal framework was presented. The NLP was submitted to MoH for approval in November 2016, and there have been many achievements, including ISO training for the metrology department of UZSTANDART. Strengths of the work done to date on laboratory systems strengthening included enhanced intersectional collaboration, which helps with problem solving. Challenges include difficulty engaging the private sector, and the members of the NLWG finding time away from their full-time jobs to work on national laboratory systems strengthening.

Partners' work on laboratory strengthening

The **EU CBRN Centres of Excellence Initiative** was introduced by Dr Francesco Miorin, and its contribution to biosafety and biosecurity, along with its action plan to strengthen capacities against CBRN risks, which include identification of gaps and elaboration of action plans, and improvement of national coordination. The national teams and stakeholders have been identified. Projects were described, including MediPIET and Medilabsecure. Project 40 is run in collaboration with WHO through, among other activities, the Better Labs for Better Health initiative, and aims to strengthen health laboratories to minimise biological risks. Activities are ongoing in eastern Europe, central Asia and the Caucasus.

The goal of the **Foundation for Innovative New Diagnostics** (FIND) was presented by Dr Maka Akhalaia, it being to provide access to diagnostics through holistic solutions, by country implementation plan development and strengthening country capacity. The EXPANDx-TB project, which was coordinated by FIND, provided access to rapid new diagnostics to increase case detection in 20 laboratories of eight countries. Work is now being done on quality improvement in TB laboratories towards accreditation using the TB Strengthening Laboratory Management Toward Accreditation (SLMTA) approach in Armenia, Azerbaijan, Belarus and the Republic of Moldova, with training of regional trainers, in-country implementation of SLMTA, and regional meetings. There has been good progress to date in the four countries.

The **MediLabSecure** project was described by Dr Jean-Claude Manuguerra, which aims to create a network of virology and entomology laboratories for a One Health approach to vector-borne and respiratory viruses in the Mediterranean and Black Sea regions. Its overall objective is to increase health security in the Mediterranean region, the Balkans and the Black Sea by strengthening preparedness to viral threats, enhancing biosafety management and creating a network of laboratories. It is working in 19 countries or areas and its activities include workshops on topics such as Crimean Congo haemorrhagic fever virus, surveillance, networking, needs assessments, along with identification and selection of laboratories. Future activities include establishment of external quality assurance (EQA) for virus serology, including arboviruses.

Discussion

Prompted by the presentations, participants asked questions about projects and donors supporting infrastructure development in central Asia, and whether it was possible to involve all of a country's laboratories in the Tajik reform process, to which the answer was yes. The potential for synergy of services was raised, for example a number of laboratory networks in Tajikistan overlap in that they perform microbiology testing. Following a question related to the ongoing government transition in Uzbekistan, follow-up of NLP and NLSP activities was outlined in more detail.

The delegate from FIND was asked how the SLMTA quality improvement system related to the TB GLI, and was informed that it was based on the GLI process, adapted to tuberculosis laboratories; whereas SLMTA is a checklist, the WHO Laboratory Quality Systems Implementation (LQSI) tool uses a phased approach. She also mentioned that supplies for the EXPANDx-TB and Global Fund projects were procured in a centralized manner after reaching agreement with the respective governments.

The NLWG members were thanked for the work undertaken, and it was reiterated that work would be done on the challenges identified, in collaboration with laboratory strengthening partners. It was emphasized that maintaining active NLWGs would constitute an excellent resource for the country.

Session 2: The European TB Laboratory Initiative

In the afternoon session Dr Soudeh Ehsani presented the **European TB Laboratory Initiative**, its core group members and activities in the areas of timely and accurate TB diagnosis using WHO recommended rapid molecular techniques as well as QMS components including a comprehensive laboratory maintenance plan. This was followed by a presentation on the subregional training of laboratory technicians and engineers from three different countries of the Region on biosafety cabinet maintenance that took place earlier in 2016 in Armenia. Subsequently, during the working group session participants discussed in small groups the laboratory maintenance plan developed by the ELI. They agreed on the usefulness and importance of the plan, which was underlined by the results obtained from a questionnaire distributed to the participants prior to the session on the importance and current status of laboratory maintenance.

The session ended with a presentation by Dr Christopher Gilpin on currently recommended WHO rapid molecular techniques for TB diagnosis, followed by a presentation by Dr Vlad Nikolayevskyy on the European Reference Laboratory Network for TB (ERLTB-NET).

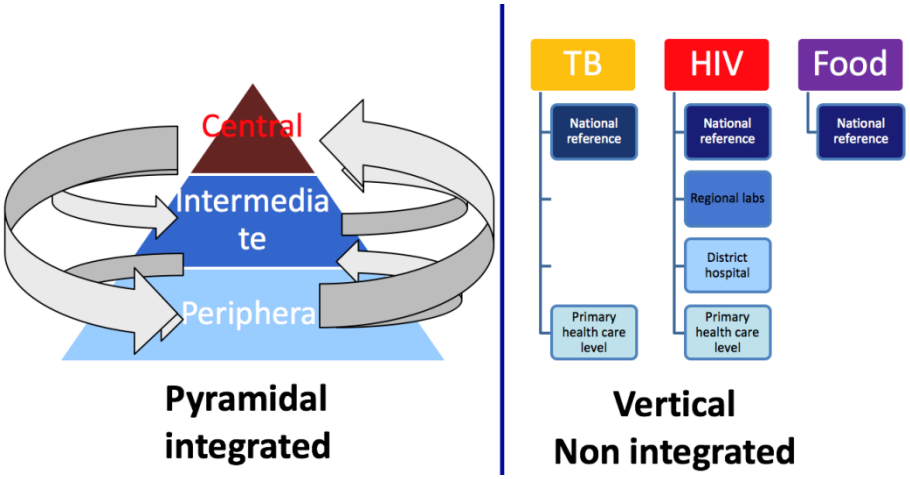
The full report of the 2nd European Tuberculosis Laboratory Initiative can be found at http://www.euro.who.int/en/health-topics/communicable-diseases/tuberculosis/areas-of-work/tuberculosis-tb-laboratory-diagnosis/about-the-european-tuberculosis-laboratory-initiative-eli.

Session 3: Public Health Laboratory Systems

The third session focused on public health laboratory systems, with a presentation of current practice and a discussion on the development of best practice models.

The topic was introduced by WHO in the context of better serving the population, with an explanation of the various related aspects, including political, human, social, technological and economic. The role of the national laboratory system was described, along with its core functions and collaboration with other public health systems. The first, second and third lines of service, offering general to subspecialty services were presented, and factors influencing the design of the public health system, such as the engagement of the private sector, the capacity of the clinical and academic laboratories, the state organization (federal vs centralized), funding (potential donors, recovering costs) were described. Theoretical models of the organizational structures of public health laboratory services were presented (Fig. 1), such as pyramidal integrated, and vertical non-integrated, along with factors to take into account the hierarchy of services, such as the volume of activity and the defined number of inhabitants in the region.

Fig. 1. Public health laboratory networks: theoretical models (by Sébastien Cognat)



The functions of laboratory networks, such as training and specimen referral, were described. Examples of systems from former Soviet Union and European Union, countries were shown. The key conclusion was that many countries were interested in reform of their public health laboratory systems, and were seeking examples to improve efficiency and function, but that one model cannot fit all countries' needs and capacities.

The USA model of core functions for public health laboratories, including disease prevention, control and surveillance, reference and specialized testing, and policy development, were presented by Dr Len Peruski and Dr Mark Rayfield from the Division of Global Health Protection of CDC, Atlanta. The purpose of the core functions were described as being to protect the public from the spread of infectious diseases, and to identify populations at increased risk of acute and chronic illnesses, as a cost-effective public health function. CDC's global work on supporting countries to develop public health laboratory systems was presented, with its focus on development of public health laboratory systems for enhanced laboratory networks, to achieve internationally-recognized laboratory accreditation, and improve and expand laboratory infrastructure.

This is done through collaboration with national and international partners, for example through a cooperative agreement on IHR core capacity strengthening with WHO, with frequent training on diagnostics and biosafety. In the United States, strengthening is done through a range of activities including self-assessment, establishing online databases for automated report generation, and publication of comprehensive laboratory competencies.

For a national perspective, the public health laboratory network managed by the National Centre for Disease Control and Public Health (NCDC) of Georgia was presented by Dr Maia Alkhazashvili. Taking a one-health approach, the NCDC is actively engaged in a number of activities, focusing on surveillance of communicable diseases, such as vaccine-preventable,

influenza, air-borne, water-borne and food-borne, nosocomial, vector-borne, parasitic, zoonotic (especially dangerous pathogens), viral hepatitis, HIV and other STI, and TB. Its mission is protection and improvement of health among the population of Georgia through scientific and evidence-based prevention of diseases, preparation for and timely response to threats to public health, and it was established in 1995 on the basis of the CDC Atlanta structure. The NCDC national reference laboratory, the Lugar Center, is located in Tbilisi and a laboratory network is located throughout the country according to population density and disease prevalence, in two zonal diagnostic laboratories and seven regional laboratories. Network activities include surveillance sentinel-site based surveillance, outbreak response and public health campaigns. The Lugar Center oversees quality processes in the network and is starting a national laboratory external quality assurance programme. The Lugar Center declared their readiness for accreditation according to ISO 15189.

The difficulty of defining a single public health laboratory, regrouping all specialized activities (e.g. HIV, TB, Polio, Bacteriology, and Parasitology), due to the multiple reference roles and functions involved, was briefly discussed. Further questions were asked on how to set up a tiered system model, and the group was advised that integration (where all specialized tests are merged to one single public health laboratory) should not be an overall goal; rather the focus should be on coordination and collaboration between different specialized laboratories in order to provide the overall public health specialized testing capacities.

Following the presentations, participants discussed in groups how countries have defined their networks, which approaches countries have used to determine the human resource capacity required, and how countries measure the performance of their public health laboratory services.

Countries reported back how their laboratory networks were structured, at the local, regional and national level, with some, such as Ukraine, currently undergoing restructuring. Human resource requirements are mainly based on the catchment population's needs. Some mentioned difficulties in establishing and maintaining legal frameworks. Performance can be measured by external quality assurance performance, number of internationally accredited laboratories and customer satisfaction forms; modes of assessment vary by location.

Session 4: The Better Labs for Better Health Mentoring project

Session 4 focused on the Better Labs for Better Health mentoring project: its strategy and progress, and featured case studies from the Russian Federation and Kyrgyzstan.

The rationale for establishing the mentoring project was explained by Dr Joanna Zwetyenga, namely that although WHO/Europe had trained laboratory experts from 23 member states on QMS, staff found it difficult to implement what they had learned due to lack of focused time, lack of support from management, and difficulty in convincing colleagues of the need for QMS implementation. WHO/Europe therefore developed the mentoring project with the aim of effective and efficient strengthening of medical laboratories through the implementation of QMS based on the international quality standard ISO 15189:2012. A secondary aim was to create a network of quality experts throughout the region. Following a competitive call for interest, potential mentors were trained and those that successfully completed the training are now working as mentors. The training included communication skills as a necessary component of engaging laboratory managers and directors to ensure ongoing commitment to the goals of the mentoring. Laboratories were invited to apply for mentoring support, following the completion of a baseline questionnaire. Mentoring visits take place three to four times per year for five days per visit. During visits, training in QMS is provided and action plans for QMS are developed with the laboratory staff and management. Between visits, communication is maintained through email, teleconference calls and document sharing platforms. Seven laboratories were being mentored at the time the meeting took place, in Kyrgyzstan, Malta, the Russian Federation and Tajikistan, with plans to start in Lithuania and Turkmenistan in early 2017. Progress is monitored using progress indicators and a checklist,

which is completed during every visit. Future plans include expansion of the mentor pool and laboratories.

The mentoring project in the **Research Institute of Influenza, St. Petersburg,** was presented by mentor Prof Ian Sharp. The laboratory of Molecular Biology and Genetic Engineering was selected as it is part of the WHO-recognised National Influenza Centre, and has a long-standing collaboration with WHO. Mentoring visits started in November 2015 and 4 have taken place to date. The mentoring team includes a quality manager and assessor for the Estonian Centre of Accreditation, and a former Microbiology Services head of quality from Public Health England. During the initial assessment, the mentors found many examples of good practice, and that the main weakness was lack of documentation, such as training records and standard operating procedures (SOPs). An action plan was developed, which had mixed success in implementation due to limited human resources, reorganisation of the Institute, and a high work load. A quality group has since been established, and 35 of 66 actions in total have been completed or closed. Regular teleconferences take place between visits. Future plans, once basic QMS is in place, are to implement continuous improvement in areas such as internal audit, corrective action and management review.

Mentoring activities in the **Research Centre of Virology and Biotechnology ('Vector')** and the **Republican Diagnostic Center (RDC), Bishkek, Kyrgyzstan** were described by mentor Dr Olga Slobodskaya. Strengths in Vector include commitment from upper management, staff enthusiasm, some quality control elements implemented, and participation in external quality assurance. The RDC laboratory can also count on commitment from management, a quality control system and the presence of a national accreditation body, but is insufficiently funded, lacks documentation and there is little computer literacy. Nevertheless, progress is being made on facility renovation and document control. QMS work should be implemented in other clinical laboratories in the country.

Overall, it was felt that progress was visible after one year, and that, beyond the laboratory level, there was a need to involve stakeholders to strengthen capacity at the national level, through activities such as network configuration, education, funding and updating of biosafety regulations, which together can work to improve laboratory quality management systems.

During the discussion, the CDC mentoring programme in the NCDC in Georgia was briefly introduced, and it was decided that progress indicators would be shared between organisations. Questions were asked about making activities achievable, and optimal duration of visits and QMS training. It was emphasised that when progress could not be made on infrastructure upgrade due to lack of resources, the focus should be on achievable improvements which do not require funding, such as document control. Visit duration must

balance the optimal vs. the reasonable, with five days having been found to be a reasonable balance, along with dialogue and information exchange between the laboratory and the mentor(s) between visits. The attrition of laboratory staff trained in QMS was framed in a positive light, as knowledge can be disseminated more widely. It was also emphasised that although mentoring activities are focused on one laboratory area, through a cascade approach, QMS procedures can be implemented in a stepwise way across a facility. The importance of management empowering staff to implement QMS was stressed.

WHO informed the participants of an upcoming online QMS tutorial which will be open access, and will function as a precursor to the face-to-face LQSI training course.

Meeting outcomes and concluding remarks

The objectives of the meeting were revisited and it was agreed that the objectives of the 2nd Partners' Meeting had been achieved, along with awareness-raising for the project, and for WHO tools and training opportunities. Laboratory specialists from different sectors, countries, and projects were brought together, and partners shared their experiences: the meeting was conducted in collaboration with the ELI, and participants learned about developments in countries and about international projects involving eastern European countries. Different models for public health laboratory functions were discussed, and partners described their work on laboratory quality mentoring programmes.

Some key conclusions drawn were:

- Countries that have developed national laboratory policies and strategies have made significant steps towards improving their laboratory systems.
- A top priority is to improve the regulatory framework pertaining to the licensing and accreditation of laboratories and a number of countries have already made important steps in this direction.
- National Laboratory Working Groups in the five countries are a key resource for providing expertize and advice to governments, partners and donors regarding laboratory system strengthening.
- There is a need to develop case studies and guidance on public health laboratory systems that can be of use to countries that are in the process of reform.
- The laboratory quality mentoring project is proving its worth and should be continued. Expansion will depend on the availability of resources.
- Better Labs for Better Health has again proved to be a platform for sharing information on laboratory strengthening initiatives between countries and partners, and a platform was provided for the ELI core group and ELI members to meet Better Labs for Better Health members and partners to exchange knowledge and experience. Continued coordination and collaboration with international partners and projects is essential for further success.

Annex 1: Resources

Better Labs for Better Health initiative
http://www.euro.who.int/en/health-topics/Health-systems/laboratory-services/better-labs-for-better-health

European Tuberculosis Laboratory Initiative
http://www.euro.who.int/en/health-topics/communicable-diseases/tuberculosis/areas-of-work/tuberculosis-tb-laboratory-diagnosis/about-the-european-tuberculosis-laboratory-initiative-eli

EU CBRN Centres of Excellence Initiative
http://www.cbrn-coe.eu/

Foundation for Innovative New Diagnostics
https://www.finddx.org/

MediLabSecure
http://www.medilabsecure.com/

CDC Atlanta – Division of Laboratory Sciences
https://www.cdc.gov/nceh/dls/

Annex 2: List of participants

Name	Affiliation
Tereza Vardanyan	National Center for Disease Control and Prevention, Armenia
Karine Teymurazyan	Standardization and Certification, Armenia
Maja Alkhazashvili	National Center for Disease Control and Public Health, Georgia
Marina Darakhvelidze	Ministry of Labour, Health and Social Affairs, Georgia
Anna Machablishvili	National Center for Disease Control and Public Health, Georgia
Iralki Sikharulidze	National Center for Disease Control and Public Health, Georgia
Tamar Kutateladze	National Center for Disease Control and Public Health, Georgia
Zabira Aushakhmetova	National Center of Expertise, Republic of Kazakhstan
Sandugash Mukazhanova	Committee of Consumer's Rights Protection, Republic of Kazakhstan
Elmira Turkmenova	Ministry of Health, Kyrgyzstan
Sveta Ibraeva	Ministry of Health, Kyrgyzstan
Ala Halacu	National Center for Public Health, Republic of Moldova
Svetlana Prudnicionoc	National Center for Public Health, Republic of Moldova
Andrey V. Vasin	Ministry of Health and Well-being, Russian Federation
Matlyuba Berdyeva	Ministry of Health, Tajikistan
Firuz Davlyatov	Republican TB Center, Tajikistan
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Mukhsim Zakirov	Public Health Ministry, Uzbekistan
Nilufar Vakhabova	Center of Prophylaxis of Quarantine and Especially Dangerous Pathogens, Uzbekistan
Members of ELI core group	
Francis Drobniewski	Imperial College London, United Kingdom
Irina G. Felker	Novosibirsk TB Research Institute, Russian Federation
Sven Hoffner	Public Health Agency of Sweden
Gulmira I. Kalmambetova	National Reference Laboratory, Kyrgyzstan
Hasmik Margaryan	Medecins sans Frontieres, Uzbekistan
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Elina V. Sevastyanova	Central TB Research Institute, Moscow, Russian Federation
Natalia Shubladze	National Centre for Tuberculosis and Lung Diseases, Georgia

Name	Affiliation
Nukra Sinavbarova	Republican Public Health Reference Laboratory, Tajikistan
Alena Skrahina	Republican Research and Practical Centre for Pulmonology and Tuberculosis, Belarus
Rasim Tahirli	Specialized Treatment Institution - WHO Collaborating Centre on Prevention and Control of TB in Prisons, Azerbaijan
ELI members	
Rafiq Abuzarov	Institute of Lung Diseases, Azerbaijan
Riccardo Alagna	San Raffaele Scientific Institute, Italy
Rusudan Aspindzelashvili	National Centre for Tuberculosis and Lung Diseases of Georgia, Georgia
Anna Barbova	National Institute of Phthisiology and Pulmonology, Ukraine
Serghei Eftodii	National Reference TB Laboratory, Republic of Moldova
Marija Joncevska	Project HOPE, The former Yugoslav Republic of Macedonia
Eduard Kabasakalyan	National TB Control Center SNCO, Armenia
Vlad Nikolayevskyy	Public Health England, United Kingdom
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The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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