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ASSESSMENT REPORT

on revision of current status of reporting and recording system in 14 virology laboratories of Republic of Tajikistan

Local Health System Sustainability Project

Technical assignment under the USAID Integrated Health Systems Strengthening IDIQ

Local Health System Sustainability Project

The Local Health System Sustainability Project (LHSS), under the USAID Integrated Health Systems IDIQ, helps low- and middle-income countries transition to sustainable, self-financed health systems to support access to universal health coverage. The project works with partner countries and local stakeholders to reduce financial barriers to care and treatment, ensure equitable access to essential health services for all people, and improve the quality of health services. Led by Abt Associates, the five-year project will strengthen local capacity to sustain strong health system performance, supporting countries on their journey to self-reliance and prosperity.

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Cover photo: Local Health System Sustainability Project (LHSS)

ABBREVIATIONS

AMEE	Abt Monitoring and Evaluation Ecosystem
CDC	Centers for Disease Control
CSSSES	City State Service of Sanitary and Epidemiological Surveillance
ELISA	Enzyme-linked immunosorbent assay
EQA	External Quality Assessment
ETICA	Eliminating tuberculosis in Central Asia
IQC	Internal Quality Control
IT	Information technology
LHSS	Local Health System Sustainability
LMIS	Laboratory Management Information System
LMW	Laboratory Medical Waste
MOH	Ministry of Health
MWM	Medical Waste Management
MW	Medical Waste
NRL	National Reference Laboratory
PHC	Primary health care
PPE	Personal protective equipment
PCR	Polymerase chain reaction
QC	Quality control
QMS	Quality management system
RT	Republic of Tajikistan
SanPiN	Sanitary rules and regulations
SOP	Standard Operating Procedure
ATSMU	Avicenna Tajik State Medical University
PGI	Post Graduate Institute
SSSES	State Service of Sanitary and Epidemiological Surveillance
TRIPM	Tajik Research Institute of Preventive Medicine
USAID	United States Agency for International Development
WB	World Bank
WHO	World Health Organization

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EXECUTIVE SUMMARY

Brief overview of the virology laboratory and its primary objectives.

In Tajikistan, the number of operating virology laboratories capable of conducting molecular diagnostic methods was insignificant. Initially, only two laboratories were involved in diagnosing the infection, but during the pandemic this number increased significantly to 16 laboratories, that is, a laboratory network was created that was formed in response to certain challenges, in this case the COVID-19 pandemic. Educational seminars and trainings were held for specialists from these laboratories in the field of biosafety and biosecurity, on the collection, storage and transportation of biological materials, infection control and on the study and implementation of modern research methods, such as PCR and ELISA, in virology laboratories. The USAID LHSS project provided Tajikistan with an invaluable contribution to the development of laboratory services to contain the developing COVID-19 pandemic. Their support contributed to strengthening laboratory capacity at the republican and regional levels, including the provision of necessary equipment and qualified personnel, which contributed to the timely and high-quality diagnosis of COVID-19.

INTRODUCTION

Background information on the virology laboratory.

Improving the quality of laboratory services in the field of healthcare is one of the important priorities for the Republic of Tajikistan. Laboratories are an integral and essential part of health systems, and they play a critical role in the detection, diagnosis, treatment, and control of diseases. However, reliable laboratory services remain insufficient in many low- and middle-income countries. Improving the quality of laboratory services in the field of healthcare is one of the important priorities of the Republic of Tajikistan and obtaining timely and high-quality virology laboratory results is relevant not only for the field of laboratory medicine but also for the overall healthcare system.

Molecular methods have become fundamental in detecting cases and serve as the basis for implementing epidemic control measures. With vaccines and medications being developed, molecular diagnostic methods will further enable monitoring the effectiveness of therapy and predicting disease trajectory and characterize circulating strains.

In Tajikistan, until 2020, the number of operating virology laboratories capable of using molecular diagnostic methods was insignificant. Since the beginning of the COVID-19 pandemic, only two well-equipped virology laboratories in Dushanbe have been used to diagnose cases of the disease, due to the infusion of investments from various organizations (Global Development Fund, ISTC). The country has had trouble confirming COVID-19 cases and deaths in regions due to limited testing capacity. Given the current situation, it was necessary to increase the number of laboratories for diagnosing COVID-19. As part of international cooperation to combat the COVID-19 pandemic, investors are promptly involved to provide support in equipping regional

laboratories with high-tech equipment and conducting training sessions for laboratory specialists. With the support of development partners (USAID, WHO, CDC, GIZ), during the pandemic, 16 laboratories in the country were equipped with the necessary equipment to conduct molecular, serological and immunological studies. Staff at these laboratories have been trained in biosafety, PCR and ELISA testing.

Since April 2020, the USAID LHSS project has made significant contributions to strengthening laboratory services in Tajikistan in response to the COVID-19 pandemic. The priority areas of the USAID LHSS project were to expand the network of laboratories that conduct laboratory diagnostics of COVID-19. Initially, these studies were carried out only in two laboratories in Dushanbe, then 2 more public health laboratories and 2 SSSES were included in this work, and then laboratories in all regional SSSES of Tajikistan and, at the final stages of the formation of this network, regional laboratories. Thus, a laboratory network for the diagnosis of COVID-19 has been formed, which covers all regions of Tajikistan. The support contributed to building the capacity of laboratory staff at the regional and national levels through the provision of necessary equipment and advanced training through educational training.

The primary direction for further development of the laboratory services in the country include strengthening standardization, by Ministryand digitalization of technological processes used in medical laboratories, which were reflected in "Map of the implementation of the digitalization component for the period 2024-2027 within the framework of the strategy for protecting the health of the population of the Republic of Tajikistan for the period up to 2030" for No. 574 dated September 8, 2023, approved by Ministry of Health and Social Protection of population of RT.

Current situation analyses:

Regular assessment of laboratories and updating of legislation and regulations related to laboratory services are necessary to maintain relevance to changing needs in the country. Before conducting the assessment, LHSS met with developmental partners working in the field of laboratory strengthening and/or experienced in strengthening the laboratory system, particularly Laboratory Management Information Systems (LMIS) in Tajikistan.

Two meetings were attended with partners including USAID Mission, World Bank (WB), FHI 360, ETICA, and Supranational TB Reference Laboratory in Gauting, Germany, etc.

During the meetings, partners shared their experiences related to the improvement of the laboratory system and current challenges and achievements.

From the discussions, participants outlined the following strengths and weaknesses of the system specifically where it is important to pay attention and work further with all stakeholders within Tajikistan.

Strengthens:

USAID ETICA project developed a Laboratory Management Information System (LMIS) for TB laboratories, that supports the full data management cycle of laboratory tools and data entry processes. Currently, FHI360 is planning to support the development of the tool and the LHSS team is in close contact with the next steps.

Weaknesses:

- The LHSS team has not identified partners who work with the network of Virology Laboratories that diagnose COVID-19.
- WB-funded project, Tech-19, is trying to adopt the COVID-19 registry to the Virology Laboratory Registry, but it's yet to be implemented in laboratories.

ASSESSMENT PURPOSE, OBJECTIVES, AND METHODOLOGY

Based on the meetings and discussions with partners. LHSS initiated the development of necessary assessment tools and further conducted an assessment aimed at the readiness of laboratories for implementing LMIS in the country.

GOAL AND OBJECTIVE:

Goal:

To improve the timely and high-quality laboratory services through the implementation of a LMIS by identifying and addressing shortages and needs of virology laboratories in the country.

Objective:

- Perform baseline assessment of conditions of 14 virology laboratories in Tajikistan.
- Identify strengths and weaknesses and apply appropriate measures to address issues.
- Digitalization of the data collection and reporting based on all laboratories.

As outlined above, analyses of the situation and assessment of the laboratory will assist in identifying strengths and weaknesses in the laboratory and taking appropriate measures to improve the system in the country.

LHSS developed an assessment tool which includes two primary aspects:

GENERAL LABORATORY INFORMATION SECTION

18 questions related to the overall work system of the laboratory including registration documents, human resources, equipment and resources availability, data recording and reporting process, etc.

DIGITAL INFORMATION SECTION

11 questions related to the data collection and management system. Capacity of workers in implementing digitalization of the laboratory based on daily activities.

To conduct the assessment, the DHIS2/LMIS Application Technical specialist developed a digital questionnaire that included statistical data and questions (open/closed) for assessing 14 virology laboratories.

The questionnaire was digitalized to improve data collection on the DHIS2 platform and installed on tablets. All specialists who participated in the Assessment completed data entry training. Assessment data was recorded on tablets and visualized and analyzed in the DHIS2-based Abt Monitoring and Evaluation Ecosystem (AMEE).

As a result of the Assessment, priority areas were identified in which LHSS should work with laboratories to strengthen and improve the sustainability of the Laboratory system. The list of laboratories is indicated below.

GENERAL LABORATORY INFORMATION SECTION

PHYSICAL LAYOUT AND DESIGN OF THE LABORATORY

The assessment result showed that all Virology laboratories are State Laboratories and reported to MOH. The list of Laboratories and locations are listed above:

Dushanbe

- Tajik Research Institute of Preventive Medicine (TRIPM)
- State Service of Sanitary and Epidemiological Surveillance (SSSES)
- City State Service of Sanitary and Epidemiological Surveillance (CSSSES)
- National Reference Laboratory (NRL)

Districts of Republican Subordination

- Tursun-zade (SSES)

Sughd Region

- Khujand (regional SSES)
- Isfara (PHC)
- Panjakent (SSES)
- Istaravshan (SSES)

Khatlon Region

- Bokhtar (regional SSES)
- Qubodiyon (Regional Hospital)
- Kulob city (regional SSES)
- Dangara (SSES)

Gorno-Badakhshan Autonomous Region

- Khorog (regional SSES)

The physical location of laboratories is specified in Fig 1 below. Nine Virology laboratories are based in the SES building, one in the Hospital Building and four in separate buildings.

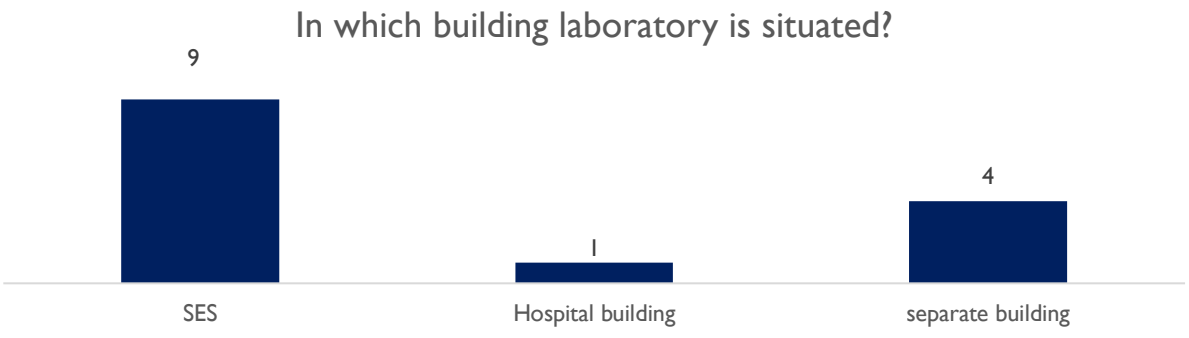


Figure 1: Physical Location of virology labs.

STRUCTURE/INFRASTRUCTURE/WORK CONDITION

The structure of a virology laboratory depends on the tasks and features of its activities. As a rule, virology laboratories, regardless of specialization, should be in clean, bright rooms with the necessary equipment and furniture. They should be isolated from other laboratories (bacteriological, toxicological, etc.).

Fig 2 shows that 12 laboratories out of 14 are isolated from other laboratories.

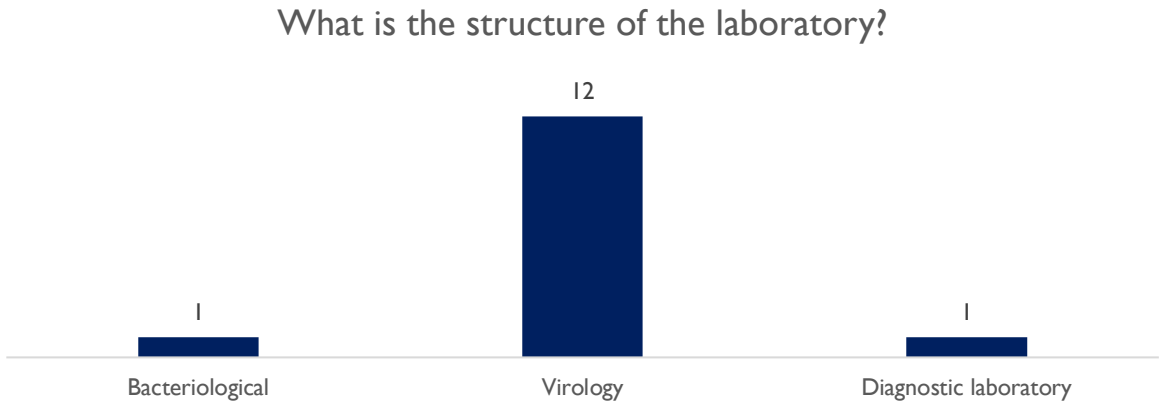


Figure 2: Structure of laboratories

According to WHO and CDC recommendations, laboratory floors should be slip resistant, seamless, impermeable to liquids, and the surfaces of walls and partitions should be smooth, impervious, and easily cleaned. Windows should be sealable and fitted with blinds. Doors should be fire resistant and fitted with vision panels. Electricity and gas supplies to the benches are needed; water and waste plumbing is optional. Each laboratory should have a hand basin and disposable paper towels provided. The air extracted from contaminated areas may be ducted directly to the atmosphere. It is important that adequate lighting is provided.

Fig 3 shows that 4 laboratories out of 14 need to be repaired; 7 out of 14 do not have the necessary heating system. One laboratory does not have a sewerage system. All 14 laboratories have the necessary electricity in place.

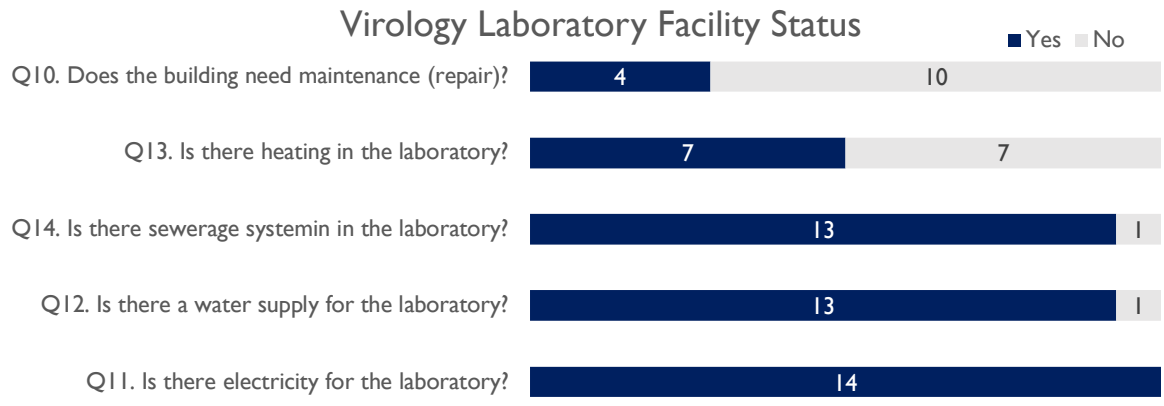


Figure 3: Work condition of Virology lab

PERSONNEL AND CAPACITY BUILDING

For quality implementation of work in all laboratories, staff play a crucial role.

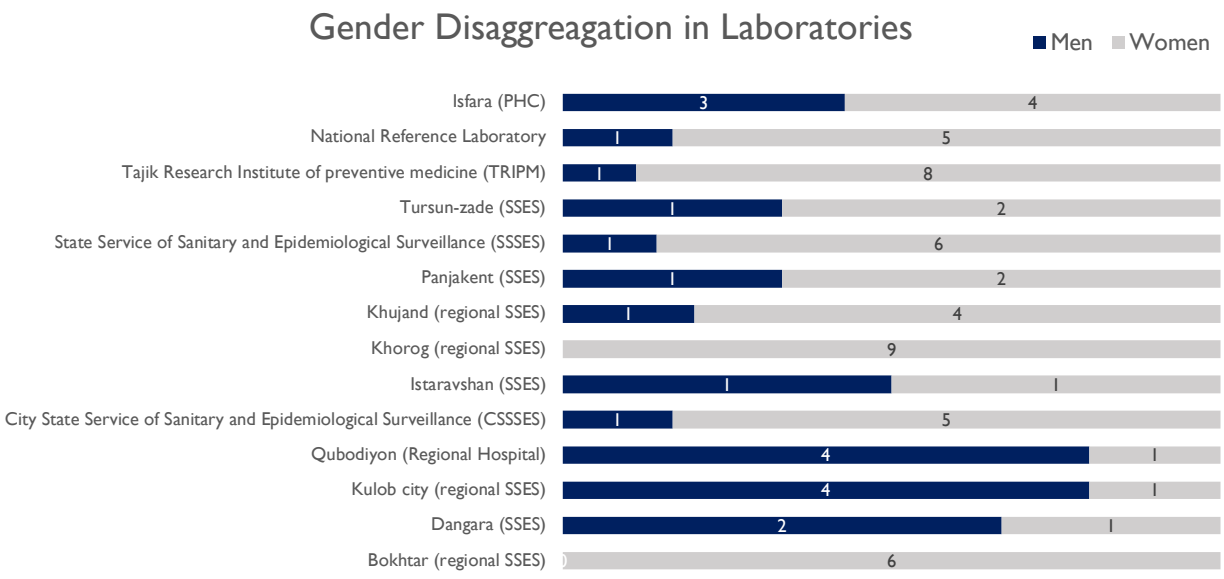
Based on the international standard, a diagnostic virology laboratory should be adequately staffed. The minimum staff requirements for a diagnostic Virology Laboratory should include a:

- qualified virologist – head of lab.
- two laboratory technicians.
- one laboratory supportive staff (register):

With this minimum staff, routine diagnostic assays for several viral diseases can be performed. However, this would depend upon the workload.

The most important aspect of human resource management in a virology laboratory is to ensure that the roles and responsibilities of all staff are clearly defined, and that continuous training is provided to improve the knowledge and skills of laboratory personnel. This will ensure that the laboratory complies with modern diagnostic methodology, as well as maintaining the quality of the services provided. The assessment found that 14 virology laboratories across the country employ 76 staff, of whom 21 are men and 55 are women. Most laboratories have sufficient staff to implement their work accordingly (Fig 4).

Figure 4: List of laboratory staff



2 out of 14 Laboratory staff perform both bacteriological and virological analyses, which is indicated in Figure 5. To ensure quality and avoid any mistakes in the laboratory, it's important that staff work for one of the laboratories and not for both (I.e. bacteriological and virological).

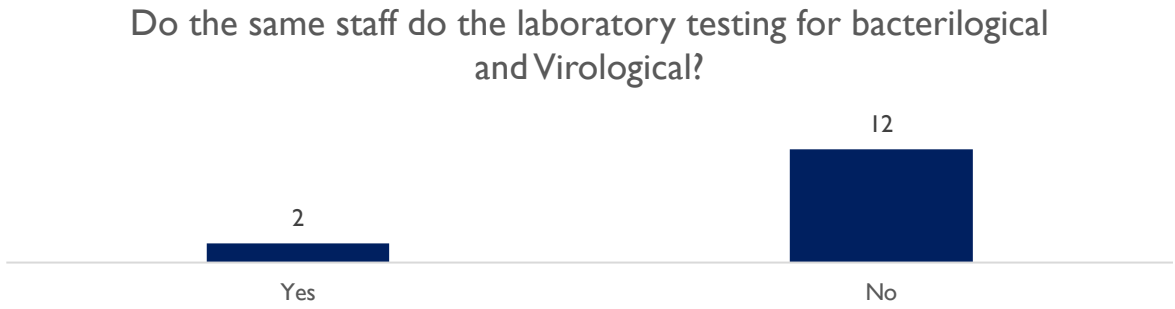


Figure 5: Number of staff involved working in both laboratories.

In terms of capacity building, six virology laboratories staff did not receive any trainings since 2022 (Fig. 6). The high turnover of specialists also influences the quality of work in laboratories. During COVID–19 pandemic, Development Partners provided several training courses related to COVID–19 test, cold chain inventory and waste management issues.

Due to the lack of on-going education and high turnover of laboratory staff additional training related to laboratory system required for all laboratory staff on methodologies, Biosafety biosecurity, QMS, IPC etc.

Figure 6: Trainings of laboratories specialists.

LABORATORY INSTRUMENTS AND EQUIPMENT, INVENTORY OF AVAILABLE EQUIPMENT

The assessment identified that all 14 virology laboratories are adequately equipped with modern technology for PCR diagnostic, however, there is still a lack of equipment for ELISA testing. A list of laboratory equipment required and available in Virology laboratories is provided in (Annex1).

BIOLOGICAL SAFETY, HYGIENE, SAFETY

In accordance with WHO and CDC requirements, the biosafety infrastructure in all 14 virology laboratories is designed based on a risk assessment for specific pathogens. Since the virus belongs to risk group 2 and for safe operation, all 14 laboratories are created according to the requirements for infrastructure, equipment, methods, and procedures to biosafety level 2.

PROCUREMENT, REAGENTS, AND EXTERNAL SERVICES

Due to lack of funds, the main laboratory procurement in the country is provided by financial support of key partners such WHO, CDC, WB and USAID LHSS. Procurement of reagents and

distribution is leading at National level by TRIPM, who is responsible for overall timely forecasting, gathering the list of materials, procurement, and distribution process.

In 2021 LHSS supported 9 laboratories out of 14 with procurement of necessary IT equipment's and implementation of 1C Medicine for timely forecasting. Unfortunately, due to the lack of internet connection in 8 out of 9 labs (only TRIPM has appropriate access to internet) the system is not fully functioning and needs to be improved.

Timely maintenance, certification and calibration of laboratory equipment, such biosafety cabinets, PCR machines are not provided and is not budgeted and there is no appointed company that could provide technical support annually.

QUALITY CONTROL. DIAGNOSTIC/CAPABILITIES:

The quality of virology laboratories results depends on the quality control (QC) system in place of the testing laboratory. Many factors such as preanalytical, analytical and postanalytical may significantly influence the results. A good quality system helps identify and resolve problems in a timely manner, ensuring reliable results. QC in the clinical Virology laboratories consist of a set of procedures designed to ensure results are consistent and accurate.

Even though the national team, with the support of partners such as CDC, WHO and USAID LHSS, continuously conduct training on QMS during COVID-19 and trained mentors at the national and regional level, QMS and QC are not implemented in 12 out of 14 virology laboratories.

There are no protocols or standard operating procedures (SOPs) for implementation of QMS, QC (EQA, IQC). And there are no Prikaz or responsible person appointed for its implementation. Several SOPs, supported by the National Coordinator, are still not updated, printed, approved, or used in the workplace. The implementation of the QMS is carried out in National Reference Laboratory (NRL), TRIPM and partially in the Khorog and Khujand laboratories.

Despite 12 additional laboratories correctly set up, equipped with modern equipment, and staffed during the pandemic, at the time of the assessment, they are not fully functioning. Table 1 shows the workload of laboratories which are insufficient and highlights 7 laboratories out of 14 have a very low workload including 2 laboratories having zero workload. The head of the laboratories explained some virology laboratories are only engaged in diagnosing COVID-19 and samples are not received. The second primary reason is due to the shortage of reagents (*Figure 7*).

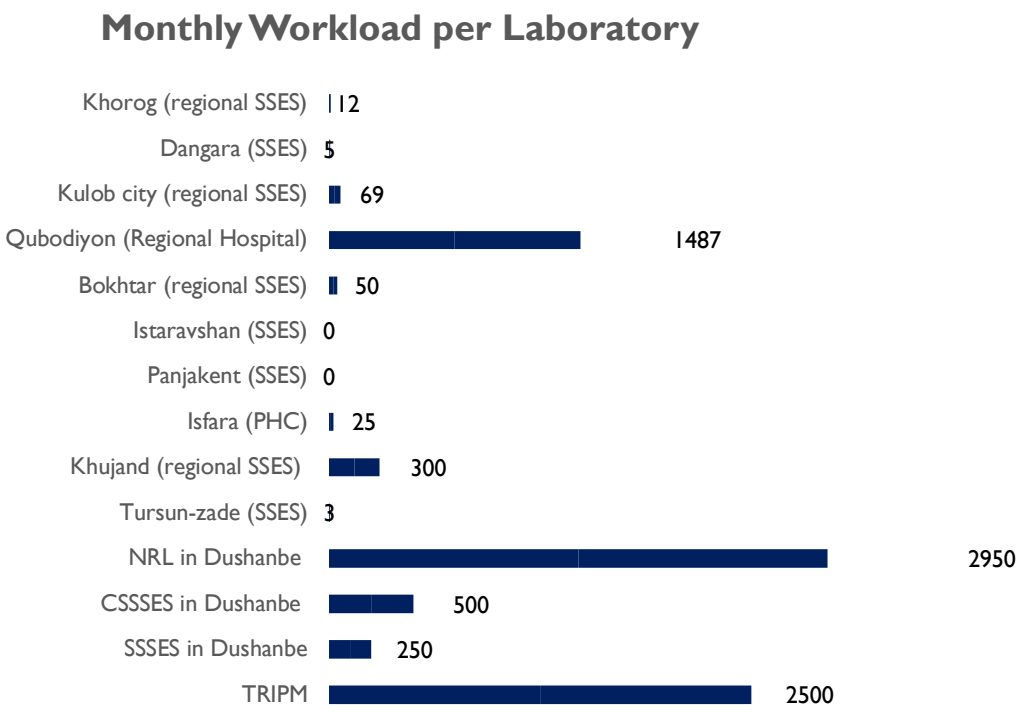


Figure 7: Workload of laboratories per month.

DOCUMENTATION

The primary requirements for laboratory documentation are based on WHO guidance: *Routine procedures in laboratories should be described in written standard operating procedures (SOPs)*. SOPs should be reviewed regularly and modified as necessary. Modified versions must be signed and dated by the head of the laboratory. The latest version of the SOP should be available directly at the workplace. Old versions should be obtained from the laboratory and archived, if necessary. Records should be retained for a long period of time but be readily retrievable.

All records must be securely archived. Archiving of source documents and other important documents must be done in such a way that the data is stored in an integer state and can neither be lost nor altered to achieve this goal. Records of use, maintenance and calibration should be kept in the laboratory and monitored regularly. Test reports should only be released after proper review and documentation of the test, signed, and dated by the laboratory manager.

Taking these requirements into consideration it was identified during the assessment that 12 out of 14 Virology laboratories have difficulties with documentation management such as there is no systematic approach to maintaining documentation and document flow in laboratories, and there is no proper record keeping and archiving of documents aligned to procedures and rules.

LABORATORY MEDICAL WASTE

Effective disposal of medical waste (MW) requires segregation and decontamination at the point of generation. Waste should be segregated based on primary contamination hazard. Infectious

waste must be segregated from general waste because it needs to be autoclaved or incinerated before being removed from the area in which it is generated.

According to the Sanitary Rules and Regulations (SanPiN) dated May 14, 2021, all MW is categorized by how dangerous it is:

- Category A – General waste
- Category B – Infectious waste, sharps waste, and pathological waste

There are three practical methods of treating contaminated laboratory waste: 1) sterilization by autoclaving, 2) chemical disinfection, and 3) incineration. Two of them were well implemented at all 14 laboratories, but not documented. Virology laboratories did not use the same approach and for the majority there was no appointed person responsible for MW and SOPs or protocols unavailable for reference. 8 out of 14 laboratories are not well equipped with incinerators.

All heads of laboratories responded that disinfection activities are carried out at MW collection, storage, and disposal sites. However, disinfection logs that track these activities were observed in only two virology laboratories.

Observations during the assessment found a lack of high-quality laboratory WM; the level of risk to the health of laboratory staff and the environment is high in 10 districts. There is a need to raise health facility personnel's awareness about the risks for individuals working with MW.

Despite the national legislative framework for MW disposal, including SanPiN 190.010.090, the quality of laboratory waste management does not meet national and international standards. Sorting and separation of hazardous waste is lacking. All institutions lack sufficient containers for waste. Collection is not done at an appropriate frequency, and there is no special transport available at the institutions. Disposal sites are mainly located at the health facilities. As a result, it is not possible to follow safe disposal methods that do not harm the environment.

Facilities lack the appropriate logs and documentation of MW collection, storage, and disposal, and managers do not oversee or monitor MW disposal.

Unfortunately, no funds are allocated that are necessary to ensure full adherence to the required waste management procedures.

All laboratories have medical waste collection boxes in limited quantities and separate collection boxes for infectious and non-infectious materials. 10 of the 14 laboratories have an autoclave and all laboratories' instruments are autoclaved before disposal. Figure 6 demonstrates 8 of 14 laboratories do not have appropriate MW procedures.

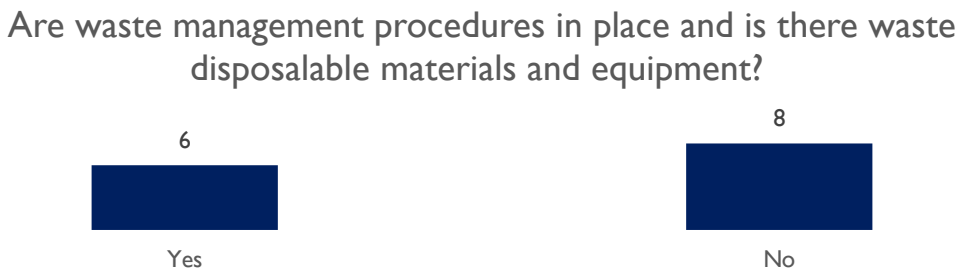


Figure 8: Waste management system in laboratories.

DIGITAL INFORMATION SECTION

Figure 8 shows that 10 out of 14 virology laboratories do not have internet connection. 11 out of 14 laboratories do not have IT specialists available.; Only 3 (Dushanbe City SSES, State SSES, NRL) have IT personnel within the Laboratory. 12 laboratories use the registration form, data and prepare reports based on the request of MOHSPP.

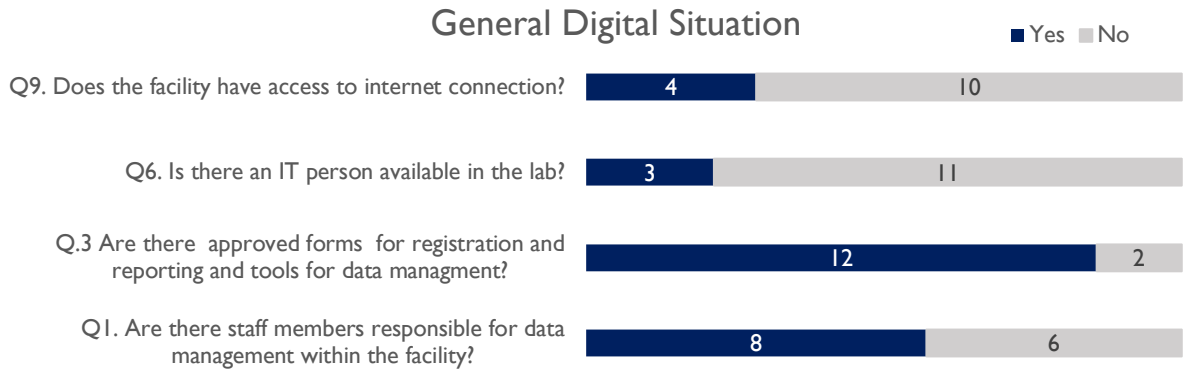


Figure 9: IT technology and access to internet in laboratories.

According to requirements, each laboratory should have a person responsible for data management and preparation of reports. Assessment showed that out of 14 Laboratories, 6 (Kulob city SSES, Qubodiyon Regional Hospital, Istaravshan SSES, Khujand SSES, Panjakent SSES, Tursun-zade SSES) do not have staff members allocated to be responsible for data management within the facility.

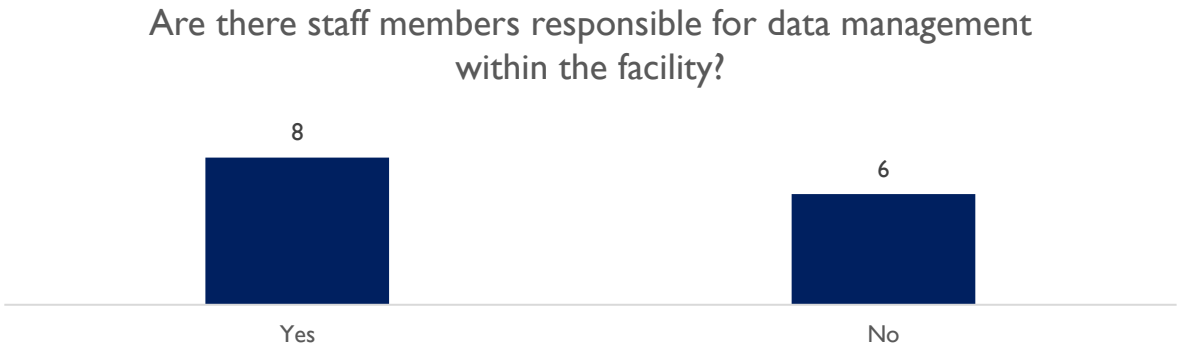


Figure 10: Responsible staff for data management issues.

Figure 11 shows that 7 out of 14 laboratories use only paper-based data collection, while the rest use both paper based and digital data collection system (Excel and Word).

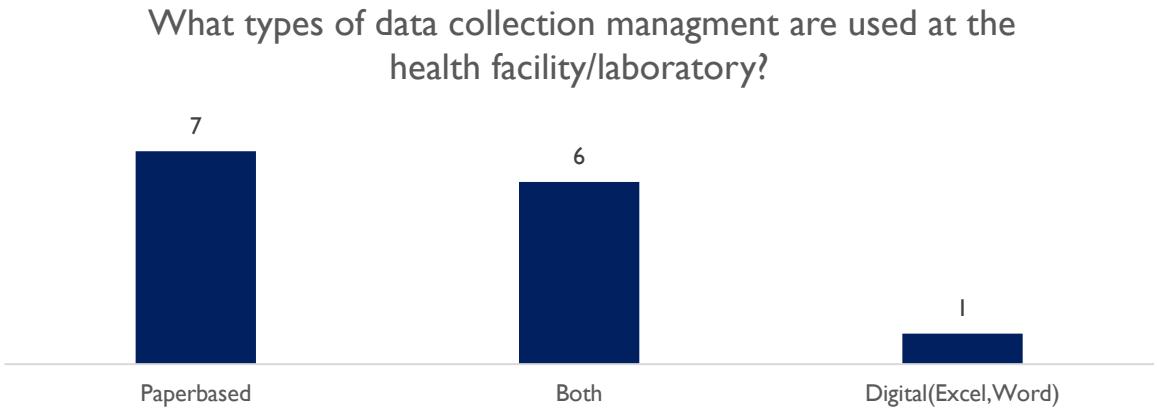


Figure 11: Type of data collection in laboratories.

In terms of having data management and information system in laboratories, the Assessment showed that only one laboratory has a digital information system in place, and it is the NRL which developed the system with support of WHO testing the LMIS system. The rest of the laboratories don't have any digital information systems in place as outlined in Figure 12.

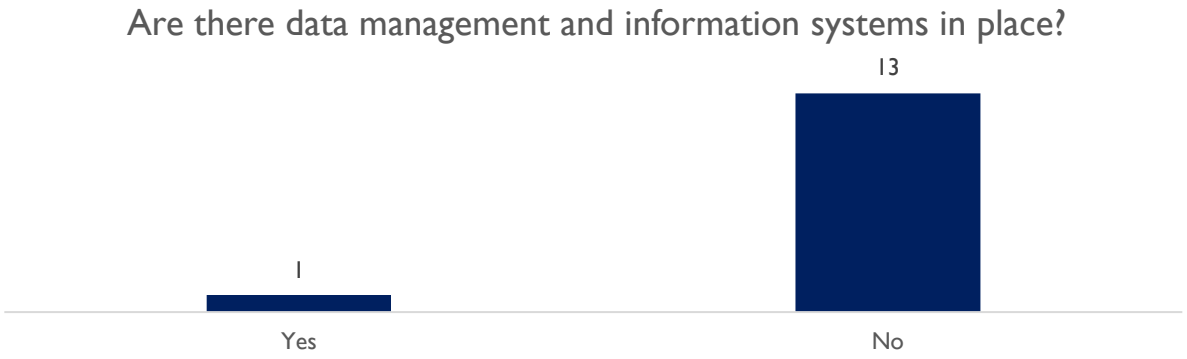


Figure 12: Data management and Information system in laboratories

The Assessment of all laboratories identified the strengths and weaknesses of all 14 Virology Laboratories in the country. (Table 1).

#	Indicators	Strengths	Weaknesses	Comments
1.	Workload per laboratory	7	7 (Tursun-zade, Isfara, Panjakent, Istaravshan, Bokhtar, Dangara, Khorog)	
2.	IT equipment for recording and reporting	14	0	
3.	IT personal	3 (NRL, SSSES, CSSSES)	11	
4.	Internet	4 (NRL, TRIPM, SSSES, CSSSES)	10	
5.	LMIS	1 (NRL)	13	

6.	MWM (incinerator)	6 (Bokhtar, Kulob, Qubodiyon, Khorog, Isfara, NRL)	8	
7.	Documentation	2 (NRL, TRIPM)	10	
8.	Personnel	14	0	
9.	Reagents (except COVID-19)	0	14	
10.	Infrastructure	14	0	
11.	Heating (air condition)	8	6 (Bokhtar, Kulob, Dangara, Khorog, Tursun-zade, Isfara)	
12.	Water supply	13	1 (Istaravshan)	
13.	Electricity	14	0	
14.	Sewerage system	13	1 (Isfara)	

Table 1: Strengths and weaknesses of laboratories in country.

Summary of key findings, recommendations, and areas for improvement.

The main directions for the further development of the laboratory service include the standardization, automation, and digitalization of the technological processes used in medical laboratories. LHSS project assessed 14 Virology Laboratories in Tajikistan on 1) General Laboratory Status and 2) Digitalization Status.

The key findings are:

- All laboratories are state laboratories.
- Shortages of laboratory equipment/obsolete laboratory equipment are prevalent.
- Only the National Reference Laboratory has a functioning digital information system in place, which was developed with support from WHO. Despite other labs lacking digital information systems and internet connection, no partners are supporting the Government of Tajikistan to connect these laboratories to the internet.
- 8 of the 14 surveyed laboratories do not adhere to a safe waste management system.
- In 10 of the 14 surveyed laboratories, there is no person designated to oversee the quality management system.
- The National Laboratory Coordination Committee, which has a mandate to provide laboratory guidance and oversight, is temporarily not functioning due to member turnover. As a result, a comprehensive quality management system manual, developed under the committee's guidance for use by country-level laboratories, is not being implemented.

RECOMMENDATIONS:

According to the conducted assessment and all discussions to improve the situation and strengthen the quality of laboratory work and service delivery, the following recommendations must be considered and implemented within all Virology Laboratories in the country.

- ***Strengthening standardization, automation, and digitalization of technological processes used in medical laboratories.*** Implement digital e-system for Virology Laboratories. Tech-19, WB funded project, developed an e-registry to capture types of virological tests and results. LHSS will engage with WB to further build and improve the e-registry. LHSS team will support interoperability of the digital e-system for Virology laboratories and align the development and further improvements in line with National Digital Health Strategy.
- ***Staff capacity building.*** Prepare trainers at the national level to provide on-the-job training and mentorship to laboratory staff. Update SOPs based on the latest standards.
- ***Testing capacity per laboratory.*** Use of laboratory capacity to diagnose other co-infections and new threats, recommended by the MOHSPP and WHO.
- **Strengthen the data management system.** Digital Data Management tool/LMIS. LHSS team will work with MOH and Implementing Partners jointly coordinate its effort in establishing a digital tool for Virology laboratories.
- **Strengthen the capacity of IT specialists.** LHSS team will train IT personnel at MOHSPP level to support the introduction of digital tools provided by LHSS activity.
- **Costing.** For sustainability, support all laboratories to better assess and plan the financial administration including utility and digitalization expenses (connection to implement supply chain management system and LMIS, heating and cooling and waste management).
- ***Reagents.*** One of the big reasons for not performing at full capacity for Virology laboratories was the lack of reagents. LHSS team will work with Implementing Partners and Donors to acquire reagents for Virology Laboratories.
- **Waste Management.** It is necessary to train employees of all laboratories in practical methods of treating contaminated laboratory waste: sterilization by autoclaving, chemical disinfection, and incineration. Develop a module based on the latest recommendations for conducting these trainings and help with updating SOPs on MW for each laboratory.

Prioritization of recommendations for immediate, short-term, and long-term implementation.

To address gaps identified in the assessment, LHSS will focus on strengthening capacity of the MoHSPP, and its health workers and laboratory technicians, through the following activities:

- Support the MoHSPP to develop a finance and an action plan with recommendations.
- Assist MoHSPP to present the results of the assessment to other MoHSPP stakeholders and implementing partners.
- Facilitate a technical working group to engage implementing partners to support virology laboratories.
- Support improvement of internal and external communications by restoring internet access through in-kind grants.
- Assist the MoHSPP with updating regulatory and legislative policies in virology laboratories.

- Partner with the MoHSPP to strengthen the capacity of laboratory staff through on-the-job training on using methodologies for diagnostic, infection prevention and control, and waste management.
- Assist in building the capacity of laboratory specialists through updated curriculum in pre- and post-diploma levels at medical colleges, Avicenna Tajik State Medical University and the Post Graduate Institute.
- In collaboration with the MoHSPP and key partners such as the WHO and the World Bank, organize a meeting to discuss current tools and select an appropriate, open-source laboratory management information system (LIS) for the 13 laboratories that currently do not utilize LIS. LHSS will align activities with the MoHSPP's system of choice to ensure its ongoing maintenance and use.
- Help the MoHSPP implement LIS in virology laboratories.

  Provide technical assistance to the MoHSPP to restore the work of the National Laboratory Coordination Committee to ensure laboratory system strengthening activities by key partners are complementary and not redundant.

CONCLUSION

In the assessment, several critical challenges have been identified. These include low laboratory workload due to reagent shortages, staffing, outdated equipment, underutilized SOPs, and a complete absence of digital systems in most facilities.

Infrastructure deficiencies, such as maintenance needs, heating issues, and equipment shortages, pose additional hurdles. Training programs vary, with some laboratories reporting no recent SOP or virological testing training in the last year. The expertise gap is evident, as 12 out of 14 laboratories have specific staff for virological tests, while two handle both bacteriological and virological tasks.

In 2021, LHSS supported 9 out of 14 laboratories with procurement of necessary IT equipment and implementation of 1C Medicine for timely forecasting. Unfortunately, due to the lack of internet connection in 8 out of 9 labs (only TRIPM has appropriate access to internet) the system is not fully functioning, and connectivity needs to be improved.

The diagnostic capabilities of these laboratories are hindered by reagent shortages, affecting the number and variety of tests conducted monthly.

In conclusion, it should be noted that the results of the assessment prove the existing problems in the virology laboratories in Tajikistan, which require full support from both site: the Ministry of Health and Social Protection of population and development partners.

ANNEX1: List of Lab materials

List of standard hardware available in the lab	number
3 box biological safety second class 2020,	1
3 tablet photometr 2017	1
All for virology laboratory	1
All types	1
Amplifier rotor gene q maybe year 2003	1
Multiscan humareader single 2016,	1
Roter Gen q 2020,	2
Autoclave	5
Amplifier	3
Biological close	5
Boxes	2
Vortex	3
Distiller	1
Despencer	3
Elisa	5
Computer	1
Mobile laboratory (KAMA3)	1
Freezer	2
Blowjob (отсос)	1
Pcr	6
Thermostat	4
Refrigerator	3
Centrifuge	6

Essential equipment and lab materials required based on International Standard and procedures:

1	Biosafety cabinets Class II –
2	Incubator
3	20 °C and –70 °C freezers
4	Refrigerate
5	Centrifuge
6	Magnetic stirrer
7	Vortex mixer
8	Electronic balance for weighing chemicals.
9	ELISA Reader and washer
10	Micropipttes (100ul, 200 ul, 20 ul)
11	Multi-channel pipettes – 8 and 12 channel pipettes (20-200 ul and 50- 300 ul)
12	Autoclave
13	PCR machine (conventional and real-time)

14	Water purification/distillation system
15	Pipettes (1 ml, 2 ml, 5 ml and 10 ml),
16	Conical flasks, reagent storage bottles (50 ml, 100 ml, 250 ml, 500 ml and 1000 ml)
17	Electric brushing machine and automatic pipette washer Desirable equipment
18	Shaker water bath ÿ Rocking platform
19	Ultracentrifuge

ANNEX2: Checklist

Laboratory Name:	National: Oblast: District:	Date:
Assessed by:		Respondent's Name:

Director of facility:
Head of laboratory:
Phone number:
Number Laboratory staff: _____
Number Laboratory staff with Computer Literacy (can work with Word, Excel)_____

General Laboratory Information Section

#	Question	List of Possible Answers	Answers	Comments
1	What is the juridical status of the laboratory?	Free Response		General
2	To whom is the laboratory reporting?	Free Response		General
3	How does the laboratory register patients?	Papperbased/Digital (Excel,Word)/Both		General
3.1	If Digital/Both to Q3, then list what digital system	Free Response		General
3.2	Do the same staff do the laboratory testing for Bacteriological and Virological?	YES/NO		
4	What type of Virology laboratory Analysis is performed? How many tests per week/month?	Free Response		General

4.1	What type of bacteriological Laboratory Analysis is performed? How many tests per week/month?	Free Response		
5	What type of possible Virology laboratory Analysis could be done and isn't? Why?	Free Response		General
5.1	What type of possible Bacteriological Laboratory Analysis could be done and isn't? Why?	Free Response		
6	Does Laboratory receive payments for analysis from patients?	YES/NO		
7	Are waste management procedures in place and is there waste disposable materials and equipment?	Free Response		Waste
8	Is there adequate separate disposal for infectious and non-infectious wastes?	YES/NO		Waste
9	Guidelines and protocol they follow and latest training they have for IPC lately?	Free Response		Waste
10	In which building the laboratory is situated?	Free Response		Manag
11	Does the building need maintenance (repair)?	YES/NO		Manag
12	Is there electricity for the laboratory?	YES/NO		Manag
13	Is there a water supply for the laboratory?	YES/NO		Manag
14	Is there heating in the laboratory?	YES/NO		Manag
15	Is there sewerage systemin in the laboratory?	YES/NO		Manag
16	List of standard hardware available in the lab	Free Response		Manag
17	Have you been given equipment to install the 1C Medicine/Pharmacy program?	YES/NO		Russel Bedford
18	How active is data entry into the 1C Medicine/Pharmacy	Free Response		Russel Bedford

	program? Please indicate the last date of data entry.			

Digital Information Section

#	Question	List of Possible Answers	Answers	Comments
1	Are there staff members responsible for data management within the facility?	YES/NO		
2	What types of data management methods are used at the health facility/laboratory?	Paperbase/Digital (Excel,Word)		
3	Are there approved forms for registration and reporting and tools for data collection?	YES/NO		
3.1	If yes to Q3, how many forms/protocols are used? Please list the names of the forms and make a copy of the forms.	Number of protocols/forms		
4	Are there data management and information systems in place?	YES/NO		
4.1	If Yes to Q 4.1 then list what they use	Free Response		
5	Is there an IT person available in the Laboratory?	YES/NO		
6	How are laboratory information and data shared within the facilities/laboratories?	By paper/By email/ Official Letter/Phone call/SMS/Messengers		
7	Does the facility have access to electronic systems? (Excel, DHIS2, any digital tool)	YES/NO		

7.1	If YES to Q.7 then list the names of electronic systems used	Free Response/Excel/DHIS2/Other		
8	Are there protocols in place for ensuring data privacy and security?	YES/NO		
9	Does the facility have access to an internet connection?	YES/NO		
10	Are all staff equipped with computers/printers?	Fully/Partially/Not at all		
10.1	If Partially/Not at all to Q 10, then list how many computers are missing	Free Response		
10.2	Provide a list of available computers/printers	Free response		
11	Is there any Development Partner working with facility?	YES/NO		
11.1	If Yes to Q 11, please list Development Partners	Free Response		
11.2	If Yes to Q 11, do they implement any digital tool or system for the facility?	YES/NO		
11.3	If YES to Q 11.2 please list the digital tools implemented or introduced by Digital partners	Free Response		
Q12	How many men are working in the laboratory?	Number of Male		
Q13	How many women are working in the laboratory?	Number of Female		
Q14	Were there trainings attended on LIS?	YES/NO		
Q14.1	If YES to Q16, then list who, when and what	Free Response		

ANNEX3: SCHEDULE OF VISITING LABORATORIES

District	Nov.7	Nov.8	Nov.13	Nov.14	Nov.15	Nov.16	Nov.20	Nov.21	Nov.22	Nov.23
Khorog (regional SSES)										
State Service of Sanitary and Epidemiological Surveillance (SSSES)										
City State Service of Sanitary and Epidemiological Surveillance (CSSSES)										
Tajik Research Institute of preventive medicine (TRIPM)										
National Reference Laboratory										
Dangara (SSES)										
Kulob city (regional SSES)										
Tursun-zade (SSES)										
Bokhtar (regional SSES)										
Qubodiyon (Regional Hospital)										
Panjakent (SSES)										
Istaravshan (SSES)										
Isfara (PHC)										
Khujand (regional SSES)										

	Team 1, Zamira Baydulloeva, Muhammadjon Sharifov and Oleg Bakunin
	Team 2, Mehrojiddin Kholov, Daler Hakimov and Lolaev Saidmumin
	Team 3, Mehrojiddin Kholov, Muhammadjon Sharifov and Oleg Bakunin
	Team 3, Mehrojiddin Kholov, Muhammadjon Sharifov and Barno Barotova