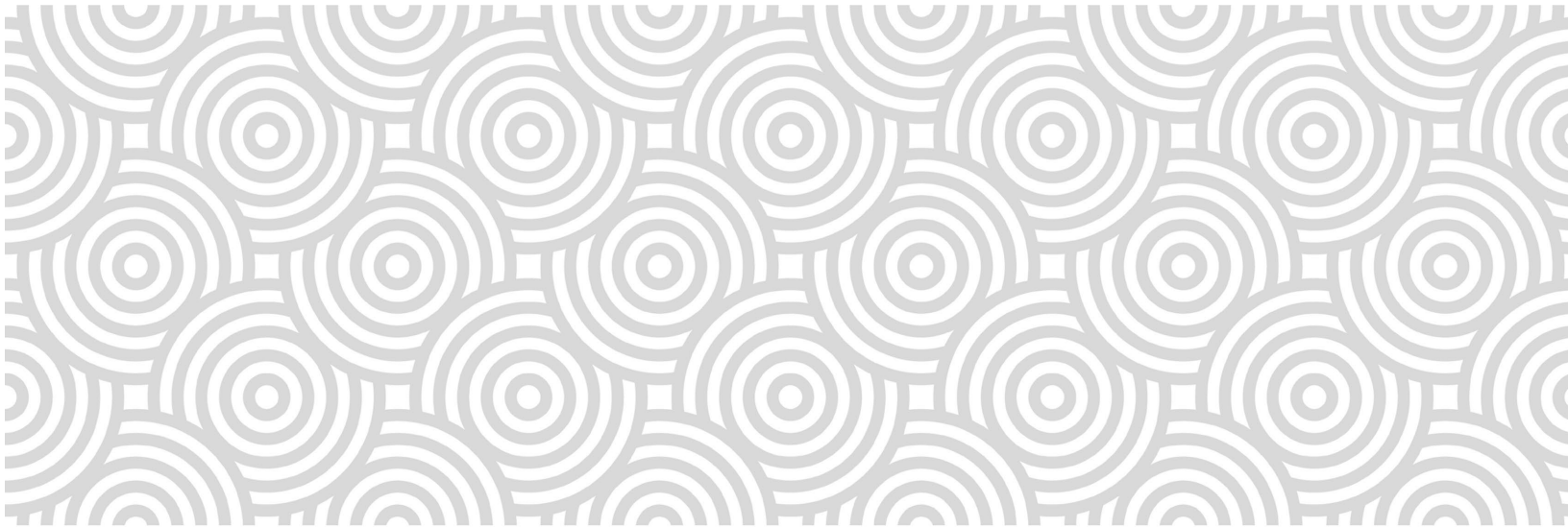




# TB Data-to-Action Continuum in Kyrgyz Republic Report

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## Abbreviations

ARC	Assessment of Reporting Capacity
D2AC	Data-to-Action Continuum
DOT	directly observed treatment
DQA	data quality assessment
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HMIS	health management information system
ICT	information and communications technology
JSI	John Snow, Inc.
KGMA	Kyrgyz State Medical Academy
KGMIPiPK	Kyrgyz State Medical Institute of Retraining and Professional Development
LDMIS	Laboratory Data Medical Information System
M&E	monitoring and evaluation
MDR	multidrug-resistant
MEL	monitoring, evaluation, and learning
MFL	master facility list
MOH	ministry of health
NCPH	National Center of Phthisiology
NRL	National Reference Laboratory of Kyrgyz Republic
NTP	national tuberculosis program
PBMEF	Performance-based Monitoring and Evaluation Framework
PHC	primary health center
RR	rifampicin-resistant
SOP	standard operating procedure
TB	tuberculosis
TB DIAH	TB Data, Impact Assessment and Communications Hub
USAID	United States Agency for International Development
WHO	World Health Organization



# Executive Summary

## Background

A strong tuberculosis (TB) monitoring and evaluation (M&E) and surveillance system is a vital tool for countries to reach global goals to end TB. The United States Agency for International Development (USAID) leads the U.S. Government's global efforts to end TB. USAID's Global Accelerator to End TB is the Agency's programmatic approach to fight TB. Under the Accelerator, USAID funds the TB Data, Impact Assessment and Communications Hub (TB DIAH) project, which developed a TB Data-to-Action Continuum (D2AC) Toolkit to measure countries' progress and guide efforts to improve their TB M&E and surveillance systems. The D2AC allows national TB programs (NTPs) to precisely gauge the barriers to data use and assess the decision-making capabilities of different actors across their health systems. The purpose of a D2AC workshop is to guide the evaluation of data use capabilities to routinely monitor and improve data use attributes associated with TB program management and service delivery at subnational and national levels. The objective is to use the findings from the application of the D2AC Toolkit to evaluate TB M&E and surveillance systems by (1) assessing decision-making capabilities of different actors; (2) precisely gauging the barriers to data use; (3) helping NTPs select appropriate interventions in the context of their health systems; (4) developing an implementation plan to apply in the future; and (5) using implementation recommendations for strategic planning purposes and decision making.

## Methods

The Kyrgyz Republic was selected as the first implementation location for the D2AC workshop. The workshop was held in June 2022 in Bishkek. Twenty-eight participants attended, representing all levels of the Kyrgyz health system and other TB stakeholder groups. The D2AC workshop was conducted in-person. The D2AC team applied a mixed methods approach conducted in three parts with the support of the D2AC Toolkit: (1) participants first completed the D2AC Toolkit's data collection instrument individually and then in groups; (2) individually and then in groups, participants provided evidence and justification in the data collection instrument for the response options selected; and (3) in groups, participants identified priority actions for post-workshop implementation. A semi-structured questionnaire and focus group discussion method were implemented during the assessment. The D2AC team facilitated the workshop with the use of slides and handouts, and there were several break-out group activities and report-backs. Quantitative data from the 30 (25 individual and five group) data collection instruments were automatically generated using the D2AC Analysis Tool. The qualitative data—observations, comments, and questions submitted in the 30 instruments and brought up in group discussions and report-backs—were transcribed and analyzed.

## Results

The overall D2AC assessment score from the aggregate group responses was 3.06 (out of 5), putting the Kyrgyz Republic at an “established” level according to the D2AC. The country performed best in domain 1 (Data Collection and Reporting, score of 3.38) and worst in domain 2 (Data Analysis and Use, score of 2.77). Domain 3 (Leadership, Governance, and Accountability), domain 4 (Capacity Building), and domain 5 (Information and Communications Technology [ICT]) received scores of 2.85, 3.25 and 3.25, respectively. The



overall score from the aggregated individual responses was similar (2.76 out of 5), albeit slightly inferior, to the group aggregate score (3.06). Comparison of the individual and group responses revealed disparities overall higher scores across all domains in group responses, but two significant lower scores for domain 1, subdomain 3 and domain 3, subdomain 1 in the group scores as compared with the individual responses. Five subdomains were identified as priorities: D1S3 (Data quality), D2S2 (Analytics and visualization), D3S5 (Monitoring, evaluation, and learning), D4S2 (Skill and knowledge development), and D5S3 (ICT business infrastructure).

## **Discussion**

The D2AC assessment in the Kyrgyz Republic shed light on the perceived weaknesses of the Kyrgyz TB system, primarily in the areas of data analysis and visualization (data use guidance specifically) and data quality. These two areas were subject to score revisions in plenary—a discussion followed by a hand re-voting process so that the score more accurately reflected the level of the TB system for these subdomains. These areas received scores lower than 2 out of 5, meaning that they were identified as being at a “nascent” stage on the continuum. The D2AC assessment in Kyrgyz Republic also shed light on the areas that were performing the best.—The strongest-performing areas were data collection and reporting practices. Other strong areas were data integration and exchange, MEL, decision making ability, and hardware. These areas received scores superior to 3 out of 5, meaning that they were identified as being at an “established” stage on the continuum. No subdomain received an average score at the “institutionalized” stage of the continuum.

## **Recommendations**

Priority recommendations were developed in small groups. They were then combined in plenary to develop a joint implementation plan, and were validated by the workshop participants. The recommendations can be summarized in four broad categories: trainings to be held (data verification, reporting form completion process, TB case definitions, clinical symptoms, treatment monitoring, and prevention measures, data analysis and interpretation, technical skills for the use of electronic tools, and management and effective financial planning), materials to be developed (standardized quality checklists, analytics and visualization manual, guidelines for data analysis and interpretation, terms of reference for data analysis for system developers, instructions for compiling electronic forms, data quality parameters, plan for intersectoral meetings on M&E, M&E manual, normative legal documents including SOPs and an ICT guideline, and training plans for managerial staff and for medical institutions), areas where monitoring was to be ensured (compliance of electronic forms, regular linkage of databases containing TB data, funding for and inclusion of M&E curricula and activities, reviewing staff schedules in the monitoring units, evaluating effectiveness of primary specialty training programs, exploring opportunities for staff incentives for specialization, providing technical support for ICT, and refining the electronic database and data entry system) and evaluations to be conducted (a data quality assessment, a cascade analysis, and an incident analysis).

## **Conclusion**

Despite progress toward ending TB worldwide, combating TB remains a high priority in the Kyrgyz Republic, especially in the COVID-19 era infection rates among health workers in the country has been high (JSI, 2021) which has contributed to a scarcity of TB services in a context

where Kyrgyz Republic still faces among the world's highest burdens for MDR/RR-TB. The D2AC assessment in Kyrgyz Republic highlighted both the high-performing elements of the NCPH's data use capabilities and the challenges that should be addressed to improve evidence-based decision making. The assessment revealed good performance in certain dimensions of the D2AC, such as data collection and reporting, MEL, and hardware. However, it also revealed important gaps, such as standardized data quality parameters, guidelines, exercises, and rigorous data use guidance. These findings provided evidence of the areas needing programmatic interventions, and can inform policymakers, donors, and program managers who want to design and implement responsive programs and interventions to strengthen and improve data use capabilities for evidence-based decision making to provide targeted and data informed high-quality services for all TB patients and their families.

## Background

A strong tuberculosis (TB) monitoring and evaluation (M&E) and surveillance system is vital for countries to achieve global goals to end TB. By routinely collecting high quality, detailed data and by effectively integrating various components of routine information systems (e.g., service statistics, disease surveillance, and financial and human resource data), national TB programs (NTPs) are better able to meet the many data demands of stakeholders; better target TB program implementation; improve the quality and efficiency of TB services; and effectively plan and advocate for resources.

### USAID Leadership in Ending TB

The United States Agency for International Development (USAID) leads the U.S. Government's global efforts to end TB. USAID's Global Accelerator to End TB is the Agency's programmatic approach to fight TB. The Accelerator increases commitment from, and builds the capacity of, governments, civil society, and the private sector to accelerate national progress to reach global TB targets. The Accelerator focuses on countries with high burdens of TB where the Agency can unite with local communities and partners to deliver performance-based results. To ensure the Accelerator's effectiveness and increased transparency, USAID uses standardized data collection and performance-based indicators that align with the targets.

### TB DIAH and D2AC

Under the Accelerator, USAID funds the TB Data, Impact Assessment and Communications Hub (TB DIAH). TB DIAH aims to ensure optimal demand for and analysis of TB data, and the appropriate use of that information to measure performance and to inform NTPs and USAID interventions and policies.

TB DIAH developed the TB Data-to-Action Continuum (D2AC) Toolkit to measure countries' progress and guide efforts to improve their TB M&E and surveillance systems. The D2AC builds on the work of the Performance-based Monitoring and Evaluation Framework<sup>1</sup> (PBMEF), the Assessment of Reporting Capacity (ARC), and other existing documentation (i.e., joint program reviews, epidemiological assessments). It allows NTPs to precisely gauge the barriers to data use and assess the decision-making capabilities of different actors across their health systems. It also helps NTPs select appropriate interventions in the context of their health systems and develop implementation plans to apply them.

The D2AC framework aims to gauge country and NTP capacity to translate data into action to improve NTP performance. Through a systematic review of existing literature and a phased review by experts to validate the concept and pretest the approach, the D2AC team developed the D2AC Toolkit (Kumar, Silver, Chauffour, Boyle, & Boone, 2021). More information on TB DIAH's D2AC Toolkit can be found at <https://www.tbdiiah.org/assessments/d2ac>

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<sup>1</sup> Available at <https://www.tbdiiah.org/resource-library/pbmef/>

## **TB and the Kyrgyz Republic**

The Kyrgyz Republic has a dedicated National Center of Phthisiology (NCPh) tackling a TB burden of 105 cases per 100,000 people as of 2020 (World Health Organization [WHO], 2022). The Kyrgyz Republic was one of the first countries in the world to provide free and full treatment to all of its patients and, while the country's TB treatment coverage was 62 percent in 2020 (WHO, 2021), the Kyrgyz Republic boasts an 81 percent treatment success rate (World Bank, 2019). In 2020 it was estimated that USD 16.1 million was still needed to fill the gap in TB funding as of 2020 (Stop TB Partnership, 2020), despite 39 percent of the 2021 TB budget being funded by foreign countries or institutions (WHO, 2022). Considering the funding gap and the desire to reach global goals, Kyrgyz Republic recognized the need to identify gaps in its current M&E and surveillance system to develop a strategic plan for improvement, and to use the strategic plan to advocate for greater funding.

While the Kyrgyz Republic is not rated in the WHO's 30 high TB burden countries it does appear on the WHO's 2021–2025 global list of high-burden MDR/RR-TB countries (WHO, 2021), with an estimated 29 percent of new TB cases classified as drug resistant, compared with 3.3 percent worldwide (WHO, 2021). However, the improvements in the coverage of testing for rifampicin resistance in all six WHO regions between 2019 and 2020 was also witnessed in Kyrgyz Republic, when it became one among 18 of the 30 high MDR/RR-TB burden countries to reach coverage of testing for rifampicin resistance of more than 80 percent in 2020 (WHO, 2021).

## **Objectives**

### **Workshop Objectives**

The purpose of the D2AC workshop was to guide the evaluation of data use capabilities to routinely monitor and improve data use attributes associated with TB program management and service delivery at subnational and national levels.

The D2AC Toolkit was used for both individual and group responses. The objective was to use the findings to evaluate TB M&E and surveillance systems by:

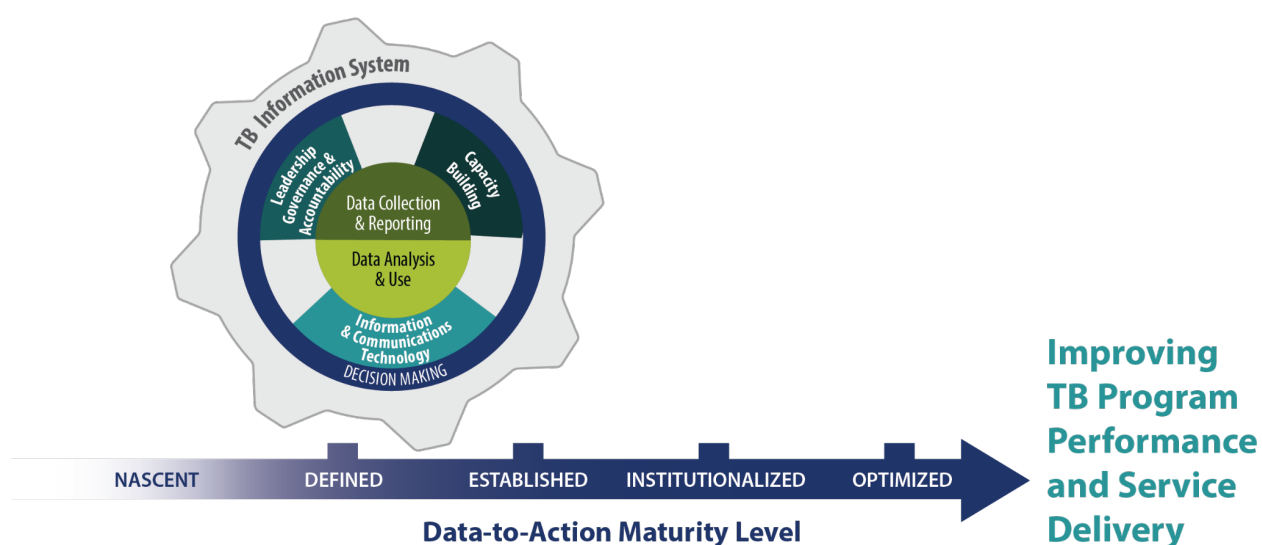
- Assessing decision-making capabilities of different actors
- Precisely gauging barriers to data use
- Helping the NTP select appropriate interventions in the context of its health system
- Developing an implementation plan to apply in the future
- Using implementation recommendations for strategic planning purposes and decision making

Beyond the standard objectives of the D2AC assessment, some objectives were also specific to the Kyrgyz Republic. The TB DIAH team in Kyrgyz Republic expressed that the findings and recommendations from this workshop would be very useful in advance of an important USAID work planning meeting scheduled for late June and early July. Furthermore, the TB DIAH—Kyrgyz Republic team expressed, on behest of the NCPh, that they were interested in implementing the D2AC Toolkit at the national level to shed light on gaps in data analysis and as a potential precursor to a similar exercise at the district (rayon) level in 2023.

## Concept

The conceptual framework (Figure 1) describes the organizational, human, technology, and process-related factors affecting data use capabilities. The framework highlights an interlinked and cyclical evolution of the health information system involving TB data collection and reporting, analysis, use, and dissemination-related interventions that build on the leadership and governance and capacity building efforts of a given NTP. The framework shows that the interlinked interventions follow a continuous improvement approach to achieve the advanced maturity levels (often identified by a descriptor, such as nascent, defined, established, institutionalized, and optimized), which are associated with an improvement of NTP performance in terms of using data for proactive and responsive clinical, programmatic, managerial, and policy decision making.

**Figure 1. D2AC conceptual framework**



## Tool Design

The D2AC Toolkit was developed under the TB DIAH project, funded by USAID's Global Accelerator to End TB. D2AC was initially developed as a framework to gauge country and NTP capacity to translate data into action to improve NTP performance. Informed by a review of peer-reviewed and gray literature, the D2AC Toolkit and process builds on previous experience with maturity models. The D2AC team documented and published a journal article on this systematic review (Kumar, et al., 2021). A phased review of the Toolkit was also conducted by the D2AC Advisory group starting in March 2021. More information on the Toolkit validation process can be found at <https://www.tbdiah.org/assessments/d2ac>

The D2AC Toolkit is composed of three components:

1. An Excel-based D2AC Data Collection Tool for collecting individual responses with: five defined continuum levels (Table 1); a country profile template to collect socioeconomic, demographic, and epidemiological indicators; a D2AC scale with

capability statements organized into five domains and 18 subdomains (Table 2) for each of the five continuum levels; key user roles and decisions organized according to USAID’s TB objectives of reach, cure, prevent, and sustain; a data collection instrument with closed-ended capability continuum response options; an analysis matrix; and an analysis dashboard.

2. An Excel-based D2AC Data Analysis Tool that automatically aggregates responses from all completed data collection instruments and generates data visualizations and recommended priority actions. This enables decision makers to make sense of and apply the findings, and to develop an implementation plan using the template provided in the D2AC Toolkit.

3. A User Guide to facilitate the use of both tools. It provides step-by-step instructions for planning and implementing the D2AC assessment and for developing an implementation plan

The Toolkit measures the status of current and desired TB M&E and surveillance systems data use capabilities across 18 subdomains, grouped in five domains. The domains and subdomains are then measured across five continuum levels: nascent, defined, established, institutionalized, and optimized (Table 1). This method offers a systematic way to show a measurable impact of improvements across processes (e.g., data collection processes); human resources (e.g., skill and knowledge development); and institutional attributes (e.g., policy, strategy, and governance).

**Table 1. The five D2AC continuum levels**

Continuum Level	Description
<b>1 (Nascent)</b>	<ul style="list-style-type: none"> <li>Formal processes, capabilities, experience, or understanding of data use issues/activities are limited or emerging.</li> <li>Formal processes are not documented, and functional capabilities are at the development stage.</li> <li>Success depends on individual effort (few committed users).</li> <li>Predominantly paper-based data management system.</li> </ul>
<b>2 (Defined)</b>	<ul style="list-style-type: none"> <li>Basic processes are in place, based on previous activities or existing and accessible policies.</li> <li>The need for standardized processes and automated functional capabilities is known.</li> <li>There are efforts to document current processes and policies, and capacity building needs.</li> </ul>
<b>3 (Established)</b>	<ul style="list-style-type: none"> <li>There are approved documented processes and guidelines tailored to data use.</li> <li>There is increased collaboration and knowledge sharing.</li> <li>Need for external technical assistance is clearly identified.</li> <li>Innovative methods and tools can be implemented and used to extend functional capabilities.</li> </ul>
<b>4 (Institutionalized)</b>	<ul style="list-style-type: none"> <li>Activities are under control using established processes.</li> <li>Requirements and goals have been developed and a feedback process is in place to ensure that they are met.</li> </ul>

Continuum Level	Description
	<ul style="list-style-type: none"> <li>Detailed measures for processes and products are being collected.</li> </ul>
<b>5 (Optimized)</b>	<ul style="list-style-type: none"> <li>Best practices are being applied, and people and the system are capable of learning and adapting.</li> <li>The system uses experiences and feedback to correct problems and continuously improve processes and capabilities.</li> <li>Future challenges are anticipated, and a plan is in place to address them through innovation and new technology.</li> <li>Processes are in place to ensure review and incorporation of relevant innovation.</li> </ul>

The D2AC scale is made up of five domains, with 18 corresponding subdomains (Table 2).

**Table 2. The five D2AC domains and 18 D2AC subdomains**

Domains	Subdomains
1. Data Collection and Reporting	<ol style="list-style-type: none"> <li>Data collection tools and workflow</li> <li>Reporting</li> <li>Data quality</li> </ol>
2. Data Analysis and Use	<ol style="list-style-type: none"> <li>Data integration and exchange</li> <li>Analytics and visualization</li> <li>Dissemination and communication</li> </ol>
3. Leadership, Governance, and Accountability	<ol style="list-style-type: none"> <li>Data use guidance</li> <li>Data access and sharing</li> <li>Organizational structure and function</li> <li>Leadership and coordination</li> <li>Monitoring, evaluation, and learning (MEL)</li> <li>Financial resources</li> </ol>
4. Capacity Building	<ol style="list-style-type: none"> <li>Data interpretation</li> <li>Skill and knowledge development</li> <li>Decision making ability</li> </ol>
5. Information and Communications Technology (ICT)	<ol style="list-style-type: none"> <li>Hardware</li> <li>Network and connectivity</li> <li>ICT business infrastructure</li> </ol>

### Workshop Design

The D2AC Toolkit is designed to be implemented as a facilitator-guided workshop with stakeholders from different aspects of the NTP (e.g., screening, diagnosis, and treatment) and from different levels of the health system. Participants discuss and achieve consensus on where the elements of NTP capacity fall on the continuum. The Toolkit then yields suggested interventions—called priority actions—tailored to stakeholders’ assessments of NTP capacities. These priority actions help the NTP improve capacity to translate data into action, targeted to the current continuum level at different levels of the health system.



## **D2AC in the Context of TB DIAH Resources**

The D2AC Toolkit can be used on its own, or as a complement to other TB DIAH tools and products as part of an assessment of a country's TB M&E and surveillance systems. When used alongside other TB DIAH tools and assessments, such as the PBMEF, ARC, or Quality of TB Services Assessment,<sup>2</sup> the D2AC activity contributes to a holistic view of a country's TB M&E and surveillance systems and its capacity to collect, analyze, and use key indicator data for TB service delivery, performance improvement, and data-based decision making.

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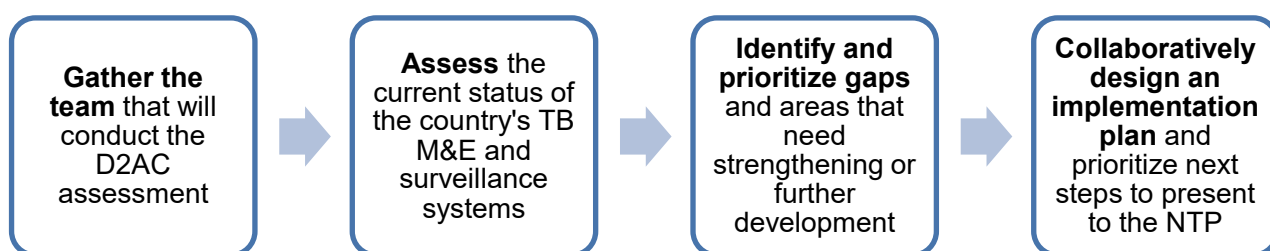
<sup>2</sup> Available at <https://www.tbdiah.org/assessments/quality-of-tuberculosis-services-assessments/>

## Methods

### Summary of Workshop Process

Planning for the D2AC workshop began in the winter 2022 with the formation of the leadership team (described in the next section). USAID played a key role in working with the NCPH and the D2AC team to secure support, identify the assessment scope, discuss the planning process, and identify participants. During the workshop, participants assessed the current status of the TB M&E and surveillance systems, identified gaps, and prioritized actions in areas that needed strengthening or further development. Once this was completed, the participants designed an implementation plan to present to the NCPH for further discussion (Figure 2).

**Figure 2. The D2AC workshop approach and process**



### Identification of the Kyrgyz Republic for D2AC Implementation

The D2AC team had several criteria in mind when considering what countries to partner with for the D2AC Toolkit implementation. Following two field tests in Anglophone countries, the team wished to host a workshop in a non-English setting and translate the D2AC Toolkit for that purpose. Second, the team wanted to conduct the first implementation in a country where there was already a TB DIAH team in place who was already working closely with a NTP, who would be able to support a Russian-language workshop, and where there would be strong support from the USAID Mission to have more NCPH buy-in and support for workshop facilitation and an increased chance of later use of the assessment recommendations and findings. Third, for health safety reasons, the team wanted to target a country with a low COVID-19 incidence at the time of the workshop.

The Kyrgyz Republic is one of USAID's 23 priority countries that TB DIAH usually works with closely as part of their portfolio of technical assistance activities, thereby providing the opportunity of administering the tool in a context where the findings would be of particular interest. Strong and established support from the NCPH was another valuable consideration. Moreover, two of the D2AC Advisory Group members are based in the Kyrgyz Republic and encouraged the implementation. After two field tests in contexts of an integrated TB system, this implementation was also an opportunity to use the tool in the context of a vertical system. Finally, the TB DIAH team had the expertise and resources to translate the D2AC Toolkit into Russian in advance of the workshop. The D2AC core team approached the Kyrgyz Republic as a possible first implementation location in June 2021, contacting the TB DIAH—Kyrgyz Republic

team on July 1, followed by the TB DIAH—Kyrgyz Republic Team Lead introducing the D2AC team to the Kyrgyz NCPH and USAID Mission on February 26.

### Formation of the Leadership Team

The leadership team consisted of one senior NCPH staff taking on the role of host; two D2AC team members as workshop co-facilitators; two TB DIAH—Kyrgyz Republic staff as workshop co-facilitators and one staff as the workshop coordinator, and two D2AC team members supporting the event from headquarters. USAID was represented at the workshop on the first and last day. The leadership team had the appropriate knowledge of the D2AC Toolkit and assessment process, and the expertise to oversee the assessment process (Table 3). The leadership team met over Zoom calls on November 3 and 19, 2021, February 8 and 22, March 10, April 28, and May 18, 2022.

**Table 3. Kyrgyz Republic D2AC leadership team**

Name	Position	Institution
Atyrkul Toktogonova	Deputy Director for Scientific Work	Kyrgyz Republic NCPH
Totugul Murzabekova	Team Lead	TB DIAH—Kyrgyz Republic
Aibike Artykbaeva	Project Officer	TB DIAH—Kyrgyz Republic
Bermet Kachkinbaeva	Finance and Admin Manager	TB DIAH—Kyrgyz Republic
Jeanne Chauffour	D2AC Team Lead/M&E Advisor	TB DIAH
Meredith Silver	Data Systems and Use Technical Advisor	TB DIAH
David Boone	Epidemiologist	TB DIAH
Yanira Garcia-Mendoza	M&E Officer	TB DIAH

### Invitation of Participants

The leadership team used purposive sampling to identify and select participants. Criteria for selection included participants from the national level (e.g., NTP, national reference laboratory, health management information system [HMIS] department); provincial level (e.g., provincial TB program unit); district level (e.g., district health/TB program unit); and health facility level (TB clinic/health unit). Emphasis was placed on diversifying participants working on TB case outreach, treatment, prevention, and TB program sustainability (USAID TB pillars of reach, cure, prevent, sustain). Twenty-five people were carefully identified by name or institution and invited by the NCPH, of which 22 attended, and another six were in attendance, either as substitutes for the original invitees or as additional invitees, for a total of 28 participants. This total did not include the TB DIAH staff.

## Workshop Process

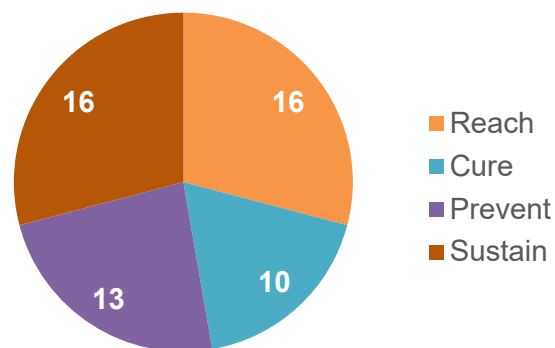
The D2AC assessment can be implemented using a variety of approaches, including individual assessment, group assessments, or a hybrid approach. In the Kyrgyz Republic, a hybrid approach was implemented. The assessment was conducted in-person. The workshop was conducted over a three-day period and included 28 key personnel identified and invited by the NCPH.

The assessment took place on June 1–3 at the Novotel City Center in Bishkek, Kyrgyz Republic. The workshop was facilitated by Jeanne Chauffour, D2AC Team Lead and M&E Technical Advisor, of TB DIAH, John Snow Inc. (JSI); Meredith Silver, Data Systems and Use Technical Advisor, of TB DIAH, University of North Carolina at Chapel Hill; Totugul Murzabekova, TB DIAH–Kyrgyz Republic Team Lead, and Aibike Artykbaeva, Project Officer, both of TB DIAH–Kyrgyz Republic, JSI. The workshop was supported by Bermet Kachkinbaeva of TB DIAH–Kyrgyz Republic, JSI and Bermet Talaibek Kyzy. The workshop agenda can be found in [Appendix A](#).

## Workshop Participants

Of the 28 participants, three (11%) were men. Nearly two-thirds of the participants came from the national level (64% – 18 participants), four participants represented the oblast level (the Kyrgyz Republic equivalent of provinces or regions), three represented the city level, and the rayon level (the Kyrgyz Republic equivalent of districts) were represented by three participants from health facilities. The four USAID TB pillars of reach (16 participants identified with this pillar), cure (10 participants), prevent (13 participants), and sustain (16 participants), were all represented by participants' areas of work and focus (Figure 3 and Appendix B, Table B1). The split was also relatively even when examining secondary responsibilities, falling into the four USAID TB pillars of reach (2 participants), cure (2 participants), prevent (2 participants), and sustain (3 participants).

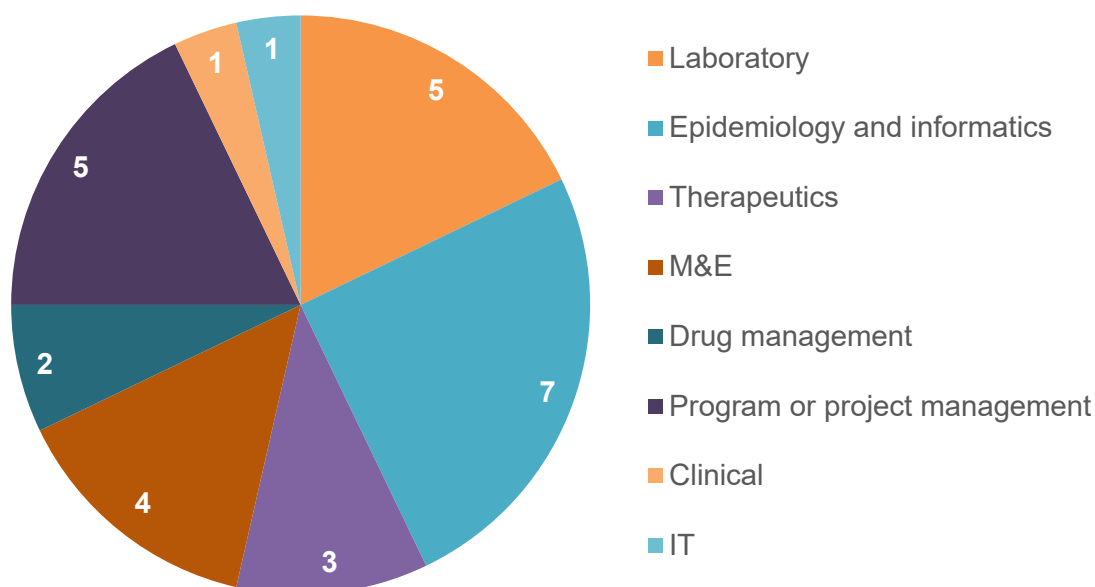
**Figure 3. Participant composition, by TB work area**



Most participants were working in epidemiology and informatics (7 participants), in program or project management (5 participants), or at a laboratory (5 participants). Other participants were

working in M&E (4 participants), therapeutics (3 participants), drug management (2 participants). The clinical and IT sectors were each represented by one participant (Figure 4).

**Figure 4. Participant composition, by TB program sector or specialty**



Eighteen participants (64%) were representing the national level. Ten participants represented the NCPH from the following units: management for scientific work (1 participant), informatics and epidemiology (5 participants), laboratory (3 participants), and therapeutics (1 participant). One other participant represented the Department of Disease Prevention and State Sanitary and Epidemiological Surveillance<sup>3</sup> (SES) of the Ministry of Health (MOH) of the Kyrgyz Republic. Finally, there were also five central level partners. The partner organization most represented was USAID, with three participants representing the Cure TB project, one participant from the Sustaining Technical and Analytical Resources (STAR) program, and one participant from the USAID/Kyrgyz Republic Mission (5 participants in total). The other two partner organizations, the WHO and the *Koninklijke Nederlandse Chemische Vereniging* (KNCV) Tuberculosis Foundation, had one representative in attendance at the workshop. One participant from the Bishkek city TB center and one participant from the Republican TB hospital “Kara-Balta” also responded to their individual instruments from the national level perspective.

The oblast level was represented by four representatives from the Chuy oblast and one participant from the Bishkek city TB center. The rayon level was represented by one participant from the Bishkek city TB center and two participants affiliated with the General Medicine Practice Center Tokmok city and the General Medicine Practice Center Ysyk-Ata rayon.

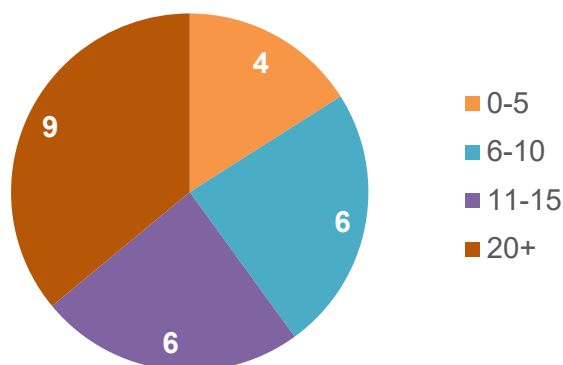
[Appendix B](#) provides the full list of participants (Table B1).

Only four attendees had less than five years work experience (14%). Approximately 22 percent of attendees had 5–10 years of experience (6 participants) and another 22 percent had 11–15 years

<sup>3</sup> Available at <https://dgsen.kg>

of experience (6 participants). Nine participants had more than 20 years of work experience (32%). Three participants did not provide a response (Figure 5 and Appendix B, Table B2).

**Figure 5. Years of experience in TB work among workshop participants**



## Workshop Proceedings

### Workshop Opening

The opening address was given by Dr. Atyrkul Toktogonova, Deputy Director for Scientific Work at the NCPH, and Dr. Murzabekova. Ms. Chauffour and Ms. Silver concluded the opening words of welcome.

The D2AC team lead presented the workshop overview, including its purpose and how the findings would be used, and the D2AC assessment approach and Toolkit.

The D2AC team lead applied a mixed methods approach conducted in three parts: (1) participants completed the D2AC Toolkit’s data collection instrument first individually and then in groups; (2) individually and then in groups, participants provided evidence and justification in the data collection instrument for the response options selected; and (3) in groups, participants identified priority actions for post-workshop implementation. A semi-structured questionnaire and focus group discussion method were implemented during the assessment.

The D2AC team lead facilitated the workshop with the use of slides and handouts. There were also several break-out group activities and report-backs. The D2AC team lead introduced the objectives of the workshop, the background of the Toolkit’s development and method, the workshop approach, and the Toolkit in detail, tab-by-tab.

The Kyrgyz Republic country profile was developed by a D2AC core team member, Yanira Garcia-Mendoza, M&E Officer for TB DIAH, JSI (who was not facilitating the workshop), with support from the TB DIAH—Kyrgyz Republic team, in parallel to the workshop taking place. The country profile is provided in [Appendix C](#).

### Individual Instrument Completion

The 25 participants were invited to fill out the D2AC data collection instrument individually with the help of the D2AC Glossary ([Appendix D](#)). This gave each participant the chance to

explore the tool, become familiar with the instrument questions and their answer options ([Appendix E](#)), and to indicate their views on the Kyrgyz Republic TB program and information system’s current status for each of the 48 capability questions associated with the five domains and 18 subdomains (Table 4). The data collection instrument also includes a set of customized questions based on the user category that the respondent associates with. The 25 filled-out instruments were aggregated in the D2AC Data Analysis Tool. The findings from the aggregated individual responses were shared in plenary using data visualizations generated by the D2AC Data Analysis Tool. The floor was then opened for comments and questions.

**Table 4. Data collection instrument questions, by domain and subdomain**

Domain	Subdomain	Questions by subdomain	Questions by domain
Data Collection and Reporting	Data collection tools and workflow	6	11
	Reporting	3	
	Data quality	2	
Data Analysis and Use	Data integration and exchange	4	10
	Analytics and visualization	4	
	Dissemination and communication	2	
Leadership, Governance, and Accountability	Data use guidance	1	11
	Data access and sharing	1	
	Organizational structure and function	1	
	Leadership and coordination	2	
	Monitoring, evaluation, and learning	4	
	Financial resources	2	
Capacity Building	Data interpretation	3	12
	Skill and knowledge development	5	
	Decision making ability	4	
Information and Communications Technology (ICT)	Hardware	2	4
	Network and connectivity	1	
	ICT business infrastructure	1	
<b>Total number of questions</b>		<b>48</b>	

### Group Instrument Completion

The 22 participants were divided into five groups of three to five people which were designed to be as homogeneous as possible. Each group had at least one representative from the national



level, at least one representative from the subnational level, at most one representative from an implementing partner/non-governmental/civil society sector organization, and with at most one man in each group (Table 5). Each group had at least one member working in an M&E role, and other roles (laboratory, informatics and epidemiology, drug management, therapeutics) were evenly distributed across groups.

**Table 5. Group composition for the D2AC instrument completion exercise**

Group number	Number of central government staff	Number of subnational levels represented	Number of partners	Man-to-woman ratio
1	2 (both NCPH)	2 (Chuy oblast, one facility)	1 (central level)	1:4
2	1 (NCPH)	2 (Chuy oblast, Bishkek city)	1 (central level)	1:3
3	3 (two NCPH, one SES)	1 (Bishkek city)	1 (central level)	0:5
4	1 (NCPH)	2 (Bishkek city, one facility)		0:3
5	2 (both NCPH)	2 (Chuy oblast, one facility)	1 (central level)	1:4

Participants were invited to fill out the D2AC data collection instrument ([Appendix E](#)) as a group. Each group discussed and built consensus on all 48 capability questions before submitting their completed instrument. The five group instrument responses were aggregated in the D2AC Data Analysis Tool. Each group presented the scores, findings, and discussion points raised during this group exercise in plenary, by selecting a question that had prompted debate or dialogue, and the discussion was open in plenary for all groups to contribute. The findings from the aggregated group responses were then shared in plenary using data visualizations generated by the D2AC Data Analysis Tool, and the floor was then opened for comments and questions.

### Co-Created Priority Actions

Following the groups' completion of the data collection instrument and plenary presentation of results, which was a moment for consensus building around the aggregate group score, the D2AC team facilitated an activity where participants individually identified the five subdomains (out of a total of 18 in the D2AC Toolkit) that were of highest priority for action, according to their experience and results (personal opinion).

Once the five priority subdomains were identified by tallying the individual votes (five votes per person, to assign to five subdomains of their choice among the 18), the D2AC facilitators asked participants to divide themselves equally across five groups (with each group assigned one of the five priority subdomains) based on their interests and votes. Participants chose what subdomain to work on and created groups of four to five people. The five groups each filled out an implementation plan worksheet. Once submitted, the five worksheets were compiled into a combined implementation plan. The combined implementation plan was projected on the screen, with each group presenting their suggested priority actions and rationale. The combined implementation plan was approved and validated by all attendees in plenary.

## **Workshop Closing**

Dr. Toktogonova gave closing remarks, expressing high satisfaction with the workshop purpose, objectives, and findings. She described a valuable learning opportunity that stressed reflection and enabled the gathering of and discussions with colleagues from different levels of the TB health system. Dr. Toktogonova also expressed gratitude for the Kyrgyz Republic being selected to pave the way in the implementation of the D2AC Toolkit. Dr. Murzabekova, Ms. Chauffour, and Ms. Silver then gave closing words on behalf of TB DIAH and the D2AC team.

At the end of the workshop, all participants received a certificate of completion.

## **Data Analysis**

### **Quantitative Data**

The quantitative data from the 30 (25 individual and 5 group) data collection instruments were automatically generated using the D2AC Analysis Tool; these data included the scores by domain, subdomain, user level, etc. The scores were automatically generated and displayed in summary data tables and bar charts. Responses were averaged across subdomain, domain, and overall to derive scores for each. Although subdomains are given an equal weight in the calculation of domain aggregates, domains are weighted by the number of subdomains they include to derive the overall score. The aggregate score generation was done by Meredith Silver and Jeanne Chauffour of the D2AC core team, using the D2AC Data Analysis Tool.

### **Qualitative Data**

The qualitative data from the assessment workshop consisted of the observations, comments, and questions presented and posed in plenary and in groups; the comments entered in the individual and group data collection instruments; the work entered on the implementation plan worksheets; and the group presentations and report-backs. The group presentation takeaways and the plenary observations, comments, and questions were carefully noted in real time during the workshop. All 30 (25 individual and 5 group) data collection instruments were reviewed manually one-by-one and all comments were noted. Last, all seven group implementation plan worksheets were transcribed and analyzed.

## **Limitations**

There are limitations to the generalizability and applicability of the findings in other contexts, given that all participants were from and were responding to questions about the context of the Kyrgyz TB system. Furthermore, the workshop was not representative of the diversity and range of experiences across the Kyrgyz Republic due to the limited number of oblast and rayon-level participants and an overwhelming majority of participants representing the central level. The purposive sampling strategy could have led to some biases, with the most engaged or involved actors in the Kyrgyz TB system being invited, agreeing to attend, and participating in the three-day workshop, as opposed to other actors perhaps less engaged or involved.

It is also possible that some courtesy bias may have been introduced, meaning that participants wished to convey an image of quality that was better than reality. This may have occurred for

several reasons, including the fact that they were invited by the NCPH's leadership and were participating in the workshop in the presence of their hierarchical superiors, and even potentially assigned to the same groups. To minimize this bias, the D2AC team first asked each participant to individually share their responses, without discussing or sharing those with anyone else in the room. Subsequently, the group work was organized so that no one person could sway a group's answers or potentially, even unintentionally, inhibit other group members from freely expressing their opinions.

Ultimately, the value of the output of the workshop depended heavily on the expertise and experience of the participants. A potential limitation arises if insufficient knowledge and experience of the local system are not brought to bear when completing the tool.

Post hoc comparison of group scores is one quality assurance approach to assess the consistency and coherence of the workshop output. Divergent group scores can indicate imbalances in knowledge or experience, or of overly influential group members.

A second quality assurance technique is comparing the individual scores to the group scores. Consistency across individual and group scores provides reassurance that output is unbiased, whereas inconsistencies reveal areas that should be examined more thoroughly.

Quality is challenging to guarantee, especially when it comes to the individual tool completion exercises. All participants completed the same data collection instrument. It took the fastest participant just 2 hours and 20 minutes, it took others four hours and 20 minutes (the latter included a lunch break interruption).

## **Challenges**

Having learned from the challenges of the two field tests, the logistical and technical challenges previously encountered were avoided, in part thanks to a workshop lasting three days instead of two, also made necessary due to a translation component not involved in previous workshops. Although two of the workshop facilitators did not speak Russian, all the materials were provided in Russian; all the data were collected in Russian, and analyzed and synthesized in both English and Russian; and a live translation service was available for the entire duration of the workshop for both Russian to English and English to Russian.

There were no challenges encountered during the course of the workshop.

## **Ethics**

The D2AC team explored the need for institutional review board approval, but it was deemed not necessary by the University of North Carolina and JSI institutional review board committees.

## **Risks**

There were no major risks associated with participating in this workshop. The non-physical risks included personal information about participants being shared with the D2AC team. This was considered of minimal risk because little or no information of a confidential nature was collected and all personal information collected during the assessment was treated as confidential; all

responses aggregated in the D2AC Data Analysis Tool were anonymized before being shared back with the participants. The primary research burden for participants was the time spent providing information to the D2AC facilitators team.

### **Advantages**

No direct benefits accrued to participants from attending this workshop. Participants were each given a transportation per diem for the two workshop days, and the one participant coming from outside Bishkek had their flights and accommodation paid for by TB DIAH. Each participant was awarded a certificate of attendance.

At the national level, there were several important societal benefits from this assessment, namely that the NCPH and its partners will receive feedback on the quality of data use and evidence-based decision making in the TB program, and that useful policy and program implications, and targeted funding allocation, may result from the findings.

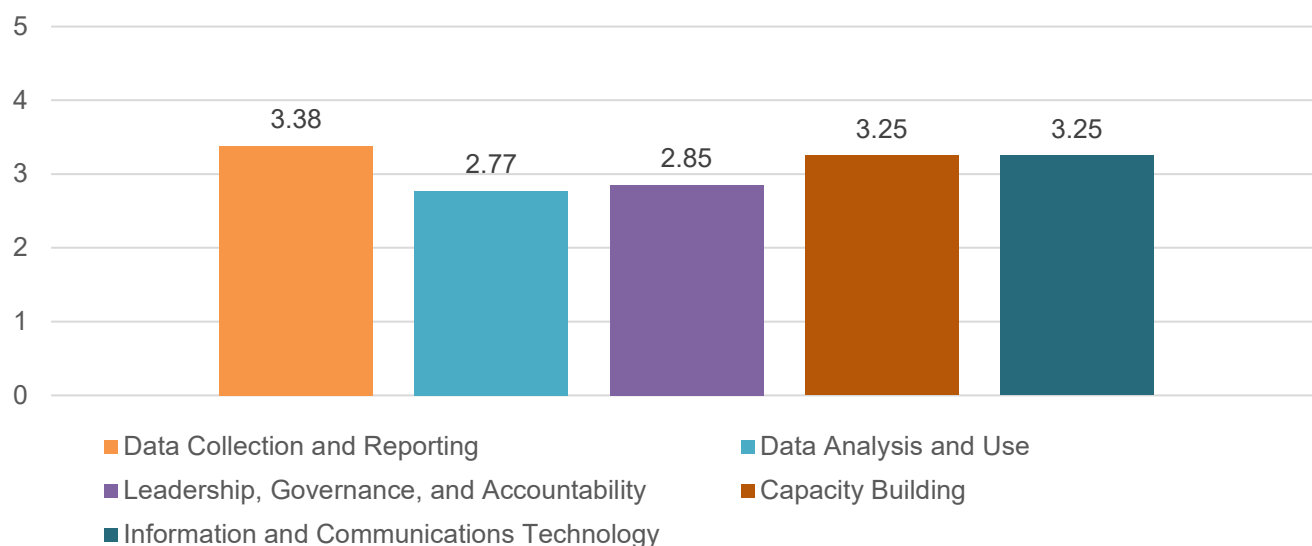
# Results

## Overall Results

The overall D2AC assessment score from aggregate group responses was 3.06 (out of 5), putting the Kyrgyz Republic at an “established” level according to the D2AC. The country performed best in domain 1 (Data Collection and Reporting, score of 3.38) and worst in domain 2 (Data Analysis and Use, score of 2.77). Domain 3 (Leadership, Governance, and Accountability), domain 4 (Capacity Building), and domain 5 (ICT) received scores of 2.85, 3.25, and 3.25, respectively (Figure 6). Summary tables of results are provided in [Appendix F](#). The answer equivalents to the aggregate group score for each of the 48 questions are highlighted in yellow in [Appendix E](#).

The overall score from aggregated individual responses was similar, albeit slightly inferior, to the group aggregate score, with a score of 2.76 (out of 5).

**Figure 6. Overall domain scores (aggregate of group responses)**

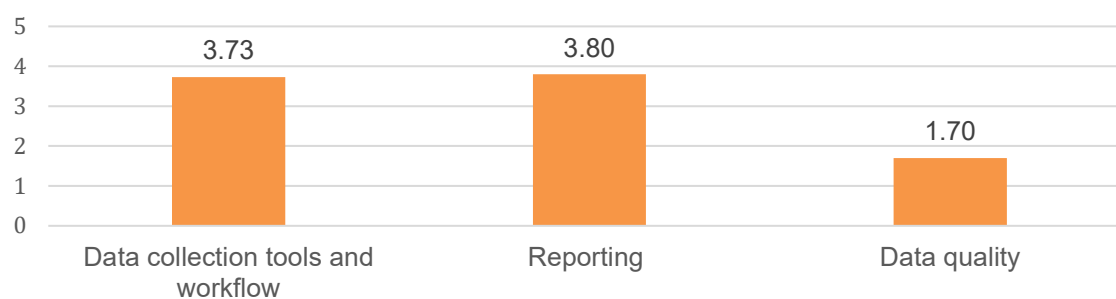


## Results by Domain

### Domain 1: Data Collection and Reporting

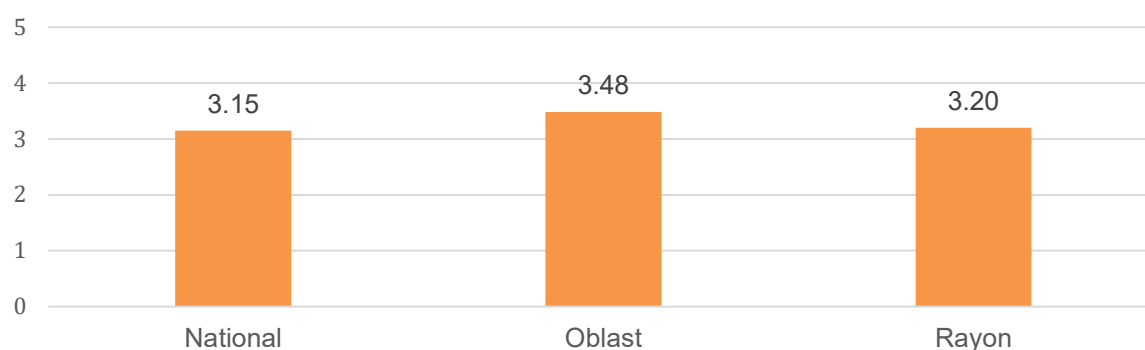
Domain 1, subdomain 1 (Data collection tools and workflow) received an aggregate score of 3.73; subdomain 2 (Reporting) received an aggregate score of 3.80; and subdomain 3 (Data quality) received an aggregate score of 1.70 (Figure 7). Domain 1 was the highest performing domain and domain 1, subdomain 2 was the highest performing subdomain.

**Figure 7. Domain 1 subdomain scores (aggregate of group responses)**



When looking at individual respondent data for domain 1, oblast-level participants gave higher scores, on average (3.48), whereas the national was the most conservative (3.15). The rayon-level score was 3.20 (Figure 8).

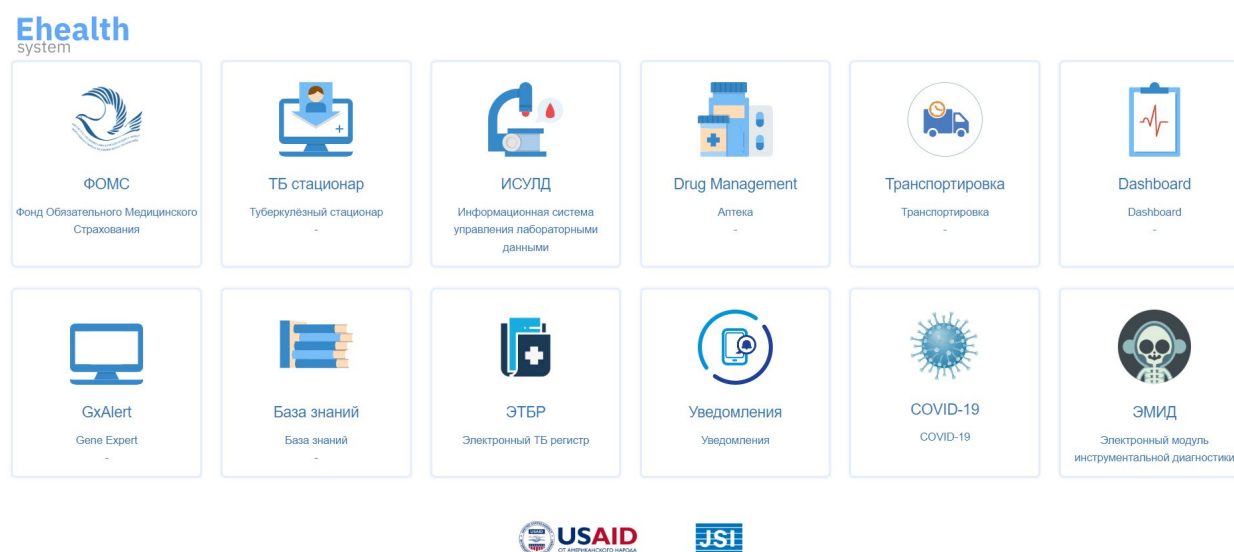
**Figure 8. Domain 1 scores, by health system level (aggregate of individual responses)**



The qualitative findings for domain 1 (11 questions) were that standardized electronic data collection tools (**question 1**) are available on the Ehealth website<sup>4</sup> which hosts the Medical Information Systems in TB Service (Figure 9). However, not all historical data are available in electronic formal and the electronic data availability is not consistent across the country. The quality of data collection and reporting varies between areas. Most historical data dating back to when only standardized paper tools were used cannot be found in the database. When it comes to laboratory staff, they use the Laboratory Data Management Information System for data entry, but reporting and statistical modules are still under development. When it comes to drug management, some practical guidelines exist for the management of tuberculosis drugs (Order № 449). In some areas, there is still a mixed system at use, with some facilities mainly using paper-based forms. There is an M&E Toolkit in place to assist with the verification of paper forms (including laboratory forms) on the electronic database. Furthermore, when it comes to the health financing system, statistics are kept in paper tools. Currently, electronic data collection tools are 90 percent used in the National Reference Laboratory (NRL), and 50 percent in the Bishkek city TB center.

<sup>4</sup> Available at <https://ehealth.kg/> and <https://tb.ehealth.kg/>

Figure 9. Screen capture of the Ehealth system website



The inventory of TB data collection systems (**question 2**) is also available on the Ehealth website and includes: Laboratory logbooks forms TB-04, TB-04U, the Laboratory Data Medical Information System (LDMIS), and is detailed in the Order of the MOH of the Kyrgyz Republic № 1739 of 29.12.2021. The inventory is not specific to TB, it includes all data collection systems for infectious and parasitic diseases. The inventory is not available at the district level, but access to this inventory from the district level is under way.

Data collection procedures are described in the 2013 M&E Manual (which will be revised in the near future). Current TB service delivery guidelines are mostly clinical in nature, and do not include guidance pertaining to data management (**question 3**). In connection with the introduction of the LDMIS, accounting and reporting forms that were previously used in TB laboratories have lost their relevance. There is a need for rapid development of reporting and statistical module in the LDMIS. Moreover, there exist practical guidelines for the management of tuberculosis drugs (Order № 449). Other national guidance documents include the Order of the MOH of the Kyrgyz Republic of 29.12.2021, № 1739 “On Improvement of Tuberculosis Records and Reporting” and Order № 523 from 28.04.2022 “Regulations on quarterly reporting” on recording and reporting in the electronic TB database.

The NTP uses a unique identification number (**question 4**), also available on the Ehealth website as it is used in the electronic TB register. Information around the unique identification number is provided in the Practical guidelines for the management of tuberculosis drugs Order № 449. The unique identification number allows health providers to access and view electronic medical records for every patient receiving treatment at any level.

The NCPH website<sup>5</sup> has an electronic list of TB centers and TB departments, but it does not include all primary health center (PHC)-level pharmacies of private health care providers (**question 5**). This list is also available on a mobile app developed by the Stop TB Partnership

<sup>5</sup> Available at [tbcenter.kg](http://tbcenter.kg)



and called OneImpact, also available as a digital platform.<sup>6</sup> When a patient is transferred to another facility for continued treatment, the transfer is also made through the electronic database.

All TB data collection (TBo2/o2y) and reporting (TBo6/o6y, TBo7/o7y, TBo8/o8y) tools allow for data disaggregation (**questions 6 and 8**). Data are also disaggregated in the electronic database, including the LDMIS. Guidance around data disaggregation is the Order of the MOH of the Kyrgyz Republic of 29.12.2021, № 1739 and the NTP Tuberculosis-5. The NTP Tuberculosis-5 is a national strategic plan that is approved by the government every five years (the TB-5 program was used from 2017–2021; the TB-6 program is currently in pre-approval review in the Cabinet of Ministers). The quality of disaggregated data is evaluated during NTP monitoring visits and summarized in NTP quality assessments reports. The paper tools allow for data disaggregation, and it is planned for all electronic tools to allow for data disaggregation as well. Participants stressed the importance of data disaggregation for surveillance data. One participant shared that “full data collection in a broad and in-depth format in the form of a conjuncture report, with a comparison and evaluation analysis of the last 3 years is carried out directly at the institution.”

Electronic data reporting (**question 7**) is done at the oblast level using TB-01 form, with data from the TB clinical data reporting forms (TBo6/o6y, TBo7/o7y, TBo8/o8y) then used in national reports. These reports are available at the Department of Informatics and Epidemiology and on the Ehealth website. The electronic database is still undergoing testing. One participant shared that at the city TB center level, reporting is still done at 70 percent using paper forms.

Alignment between data reporting processes and TB service delivery guidance (**question 9**) is ensured by the NTP following NTP guidelines. Verification of reporting data is carried out both at the regional level and at the national level. The district phthisiatrician reports to the region using the TB clinical data reporting forms (TBo6/o6y, TBo7/o7y, TBo8/o8y). Accounting and reporting forms (forms  $\Phi$ -14 and  $\Phi$ -17) also align with TB service delivery guidance—as one participant noted, “only statistical data are transmitted (number, gender, rural-urban, nosology of the disease, in- and out-of-home).”

Data quality parameters (**question 10**) are defined for NTP programmatic indicators in Annex 3 of the “Indicators of Programme VI for 2022–2026.” One participant shared that “reports on the database have not been done yet, there is a program in the NCPH that makes a report on the data entered. There is a big discrepancy with the paper reports, it turned out that there are many inconsistencies in the entered data for various reasons: the data are not entered, because the patient is in another institution for inpatient treatment, it is necessary to search, call, ask the doctor to enter the patient's data; there are mistakes when entering. I would like to have a program that makes a report on the electronic database in the field in the district in order to correct deficiencies in the database in time.” Another participant confirmed that primary data entry is not always of good quality (e.g., the right tests are not always ordered for the right purpose, or new cases versus previously treated cases are not correctly reported).

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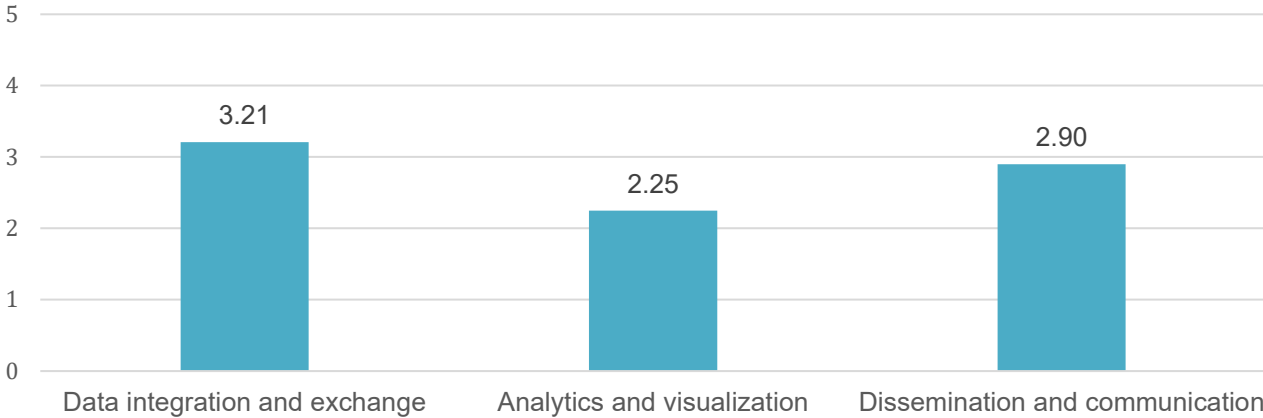
<sup>6</sup> Available at <https://stoptbpartnershiponeimpact.org/>

Data quality reviews (**question 11**) are limited to activities conducted under donor-funded international projects and programs. TB DIAH has developed a data quality assurance tool and is currently supporting two regions to pilot the tool and validate it for wider use in Kyrgyz Republic.

**Domain 2: Data Analysis and Use**

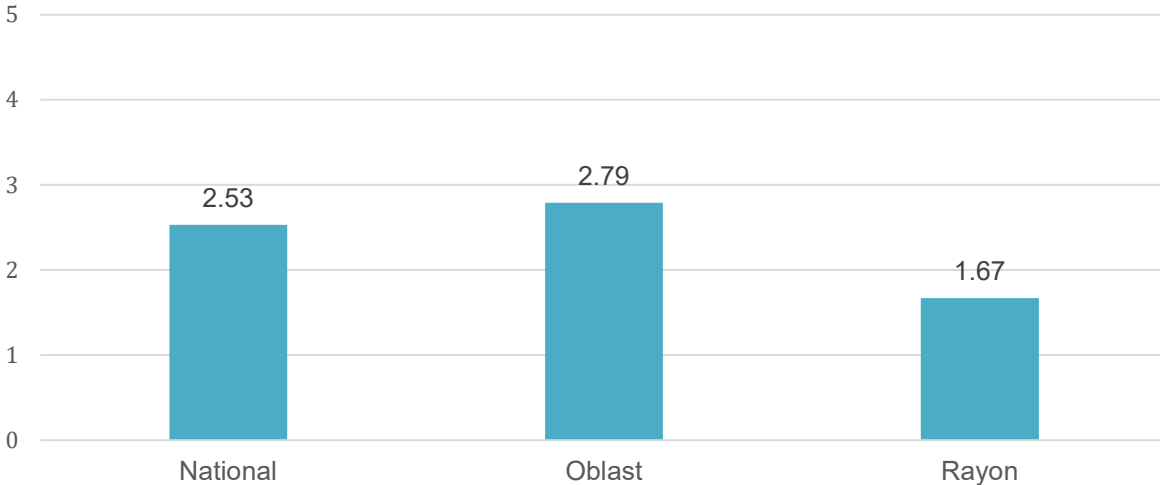
Domain 2, subdomain 1 (Data integration and exchange) received an aggregate score of 3.21; subdomain 2 (Analytics and visualization) received an aggregate score of 2.25; and subdomain 3 (Dissemination and communication) received an aggregate score of 2.90 (Figure 10). Domain 2 was the lowest performing domain.

**Figure 10. Domain 2 subdomain scores (aggregate of group responses)**



When looking at individual respondent data for domain 2, oblast-level participants gave higher scores, on average (2.79), whereas the rayon level was the most conservative (1.67). The national-level score was 2.53 (Figure 11).

**Figure 11. Domain 2 scores, by health system level (aggregate of individual responses)**

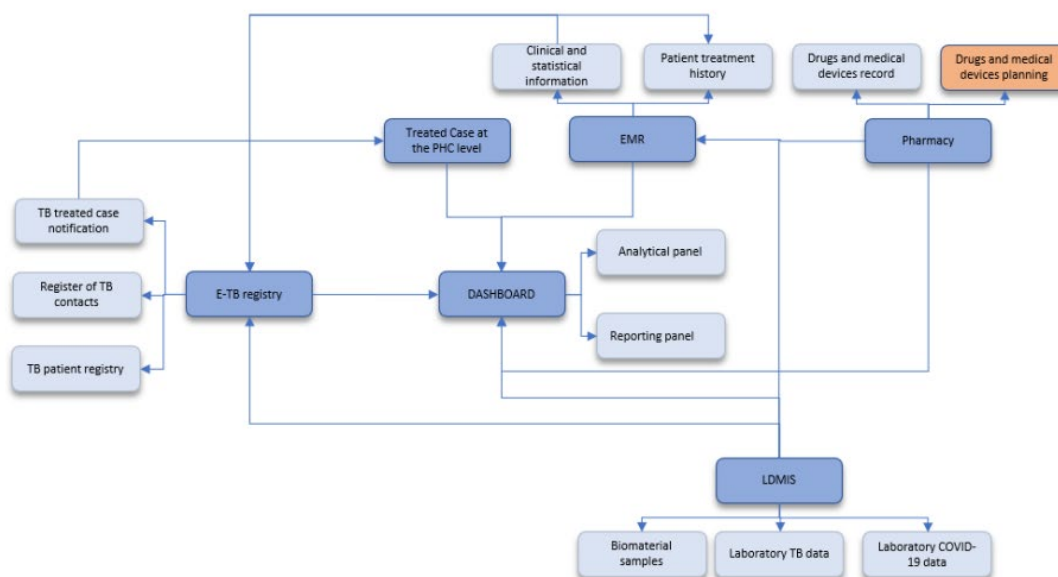


The qualitative findings for domain 2 (10 questions) were that Ehealth stands as the central data repository (**question 12**), with the server hosted at the NCPH's central offices. TB data are available for central, regional (oblast), and district (rayon) levels. While there are still servers hosting data from outdated databases, those are not accessible from the Ehealth platform.

Data exchange between systems at points of service and central repositories (**question 13**) is possible on Ehealth, with pharmacy data, for example, being available for exchange.

Data exchange processes between points of service and laboratory testing and reporting or central repositories (**question 14**) is hosted on Ehealth and the laboratory information system website<sup>7</sup> (Figure 12). Historical laboratory data are only available in paper form.

**Figure 12. Overview of interconnection of TB MIS**



Source: Kyrgyzstan ARC Report (TB DIAH, 2021)

Participants shared that it is not possible to view data from electronic registers previously used in the country. No merger of databases was carried out and there are no exchange standards in place (**question 15**). There are also ad hoc data exchanges processes in place between projects, and data exchange activities are currently supported by donors.

Users' ability to conduct analyses and develop visualizations (**question 16**) is mostly limited to the central level. Analysis is still donor- and project-specific, for example CDC or PEPFAR projects, and analysis of work on methadone maintenance therapy (MTCT) sites.

Data analytics and visualizations requirements (**question 17**) are ad hoc, and mostly steered by projects. The NRL, however, has standard requirements for data analysis and visualization.

Data sources are used (**question 18**) for checklist purposes, or in trainings aimed at improving decision making skills.

<sup>7</sup> Available at <https://lis.ehealth.kg/>

Decision support tools (**question 19**) are currently in the process of being developed. The objective is for them to be based on the monitoring of program implementation at all levels from the analysis of data, to resolving problems identified during the data monitoring activities. The tools will include a timeframe and solution(s) proposal to eliminate the identified problem(s) based on the indicator they are associated with.

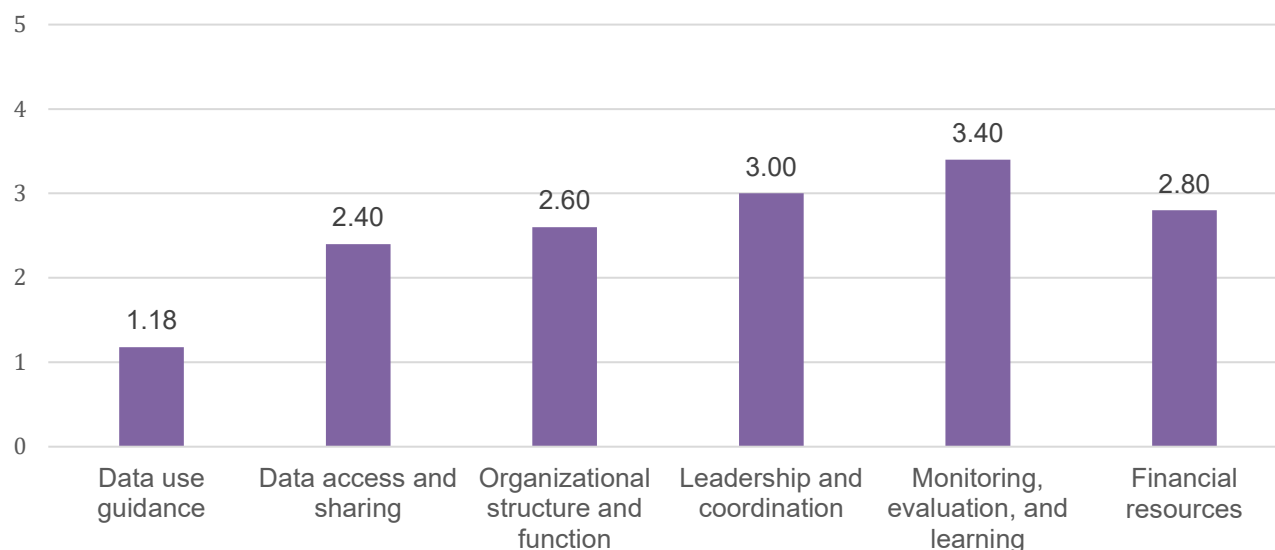
An approved communication strategy, the NTP Tuberculosis-5, is mostly followed at the national level, which is not the case at subnational levels (**question 20**).

Information products (**question 21**) are available on the Ehealth website, or as SOPs. There are also annual reports developed by the MOH and data submitted annually for the country's TB profile. M&E activities are conducted at each level of the TB system according to guidance provided in the NTP Tuberculosis-5 guidance. Participants shared that most information products developed and disseminated is in the context of projects, and not as common in the public sector.

### Domain 3: Leadership, Governance, and Accountability

Domain 3, subdomain 1 (Data use guidance) received an aggregate score of 1.18; subdomain 2 (Data access and sharing) received an aggregate score of 2.40; subdomain 3 (Organizational structure and function) received an aggregate score of 2.60; subdomain 4 (Leadership and coordination) received an aggregate score of 3.00; subdomain 5 (Monitoring, evaluation, and learning – MEL) received an aggregate score of 3.40; and subdomain 6 (Financial resources) received an aggregate score of 2.80 (Figure 13). Domain 3, subdomain 1 was the lowest performing subdomain.

**Figure 13. Domain 3 subdomain scores (aggregate of group responses)**



When looking at individual respondent data for domain 3, oblast-level participants gave higher scores, on average (3.07), whereas the rayon level was the most conservative (2.38). The national-level score was 2.58 (Figure 14).

**Figure 14. Domain 3 scores, by health system level (aggregate of individual responses)**



The qualitative findings for domain 3 (11 questions) were that an SOP for data use guidance newly exists at the NCPH (**question 22**) through the NTP Tuberculosis-6 guidance (not yet publicly available). The NTP Tuberculosis-6 includes an update to the 2013 M&E manual which is the SOP currently used. It takes into account UN targets and recommended core and additional indicators included in the End TB Strategy.

In terms of data sharing, the data exchange mechanism is not systematic, only upon request (**question 23**).

Job descriptions do not always explicitly account for responsibilities pertaining to data use (**question 24**). The NCPH designs the roles and responsibilities for the Informatics and Epidemiology Department, the M&E divisions, and the oblast TB centers. The NRL has job descriptions that outline the roles and responsibilities of staff in terms of data use.

The interagency leadership and coordination team (**question 25**) is the Global Fund's Country Coordinating Committee. They share meeting minutes and have developed their own regulations. They work closely with the Department of Statistics and Institutional Monitoring.

A meeting of the Board of Directors on the implementation of activities takes place on a regular basis (**question 26**).

Guidelines for MEL will be developed and adopted as part of the approved Tuberculosis-6 strategy, and will be available at all levels (**question 27**). The NTP is currently holding regular meetings to discuss these MEL considerations and to identify what to include in the MEL guideline under revision. In terms of applied MEL, all levels have their own approved schedule of monitoring visits.

Treatment outcomes are documented at all levels, but are analyzed mainly at the central level (**questions 28**). MEL guidelines are outlined in NTP guidelines for TB treatment. MEL processes are developed in the M&E Manual that is currently under review, and in NTP guidelines (**question 29**). Staff are required to be trained on MEL on a regular basis. MEL supports NCPH program improvements (**question 30**) but no further details were shared by participants.

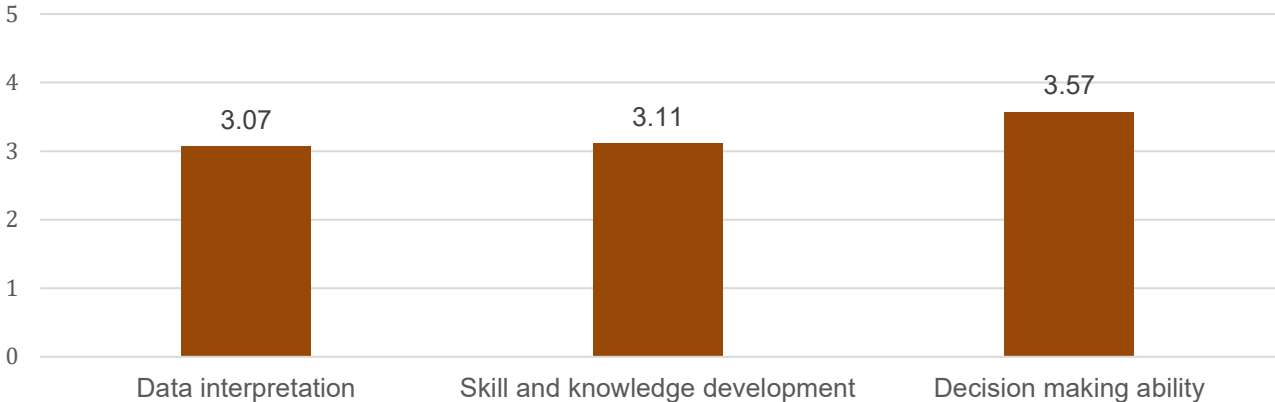
The budget for data use (**question 31**) is set aside by MOH orders.

Financial resources are mobilized (**question 32**) via agreements and joint action plans of the NCPH and international projects. TB-5 and TB-6 strategic programs are supported by financial calculations aimed at their implementation. These financial plans define the NTP resources, donors need to implement the NTP programmatic goals. Some participants remarked they were unsure if financial resources are set aside for data use purposes.

**Domain 4: Capacity Building**

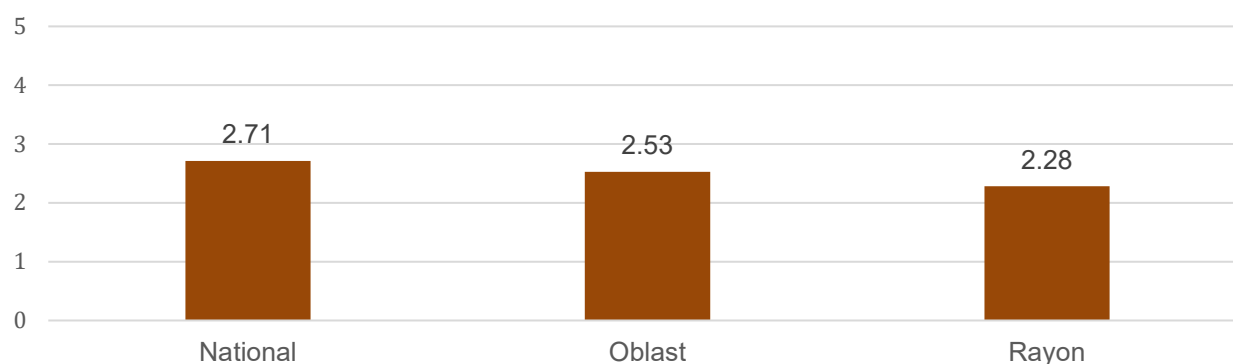
Domain 4, subdomain 1 (Data interpretation) received an aggregate score of 3.07 and subdomain 2 (Skill and knowledge development) received an aggregate score of 3.11 (Figure 15). For Domain 4, subdomain 3 (Decision making ability), the aggregate score was taken from the individual as opposed to the group responses, since the four questions under that subdomain were about personal job satisfaction, training, supervision, and motivation. This third subdomain, from the aggregate of individual responses, received a score of 3.57.

**Figure 15. Domain 4 subdomain scores (aggregate of group responses for subdomain 1 and 2 and of individual responses for subdomain 3)**



When looking at individual respondent data for domain 4, the national-level participants gave higher scores, on average (2.71) while the rayon level was the most conservative (2.28). The oblast-level score was 2.53 (Figure 16).

**Figure 16. Domain 4 scores, by health system level (aggregate of individual responses)**



The qualitative findings for domain 4 (12 questions) were that some participants reported that data use forums (**question 33**) exist but are primarily supported by donors, such as M&E working groups – whose meeting minutes are circulated.

Data reviews (**question 34**) happen on multiple fronts: the NCPH regularly reports on the epidemiological situation and submits these to the MOH, projects (e.g., USAID-funded projects) host their own data review meetings, and there are also data review meetings organized at the time of submission of quarterly reports.

The NCPH staff receive on-site technical support (**question 35**) through pilot projects from international donors on some specific skills or practices (e.g., conducting cohort analysis as performed in the Chuy, Naryn, Talas, and Batken oblasts). Other participants shared that they receive support upon their request – they will reach out to an IT specialist to ask for guidance, for example. At the national and oblast levels, funds are allocated from the state budget for monitoring on a per capita basis<sup>8</sup>.

Pre-service training programs for skill and knowledge development developed by the NTP (**question 36**) is hosted by the Kyrgyz State Medical Institute of Retraining and Professional Development (KGMIPiPK), which also allows for pre-service specialized training. One participant shared that “training has begun for regional and district TB specialists on how to assess the reported data at their level.” The NCPH has assigned KGMIPiPK with the role of managing pre-service training (**question 37**), but providers of training activities are not limited to KGMIPiPK and are also represented by international organizations/projects or non-governmental organizations (funded by international organizations).

KGMIPiPK is the main body hosting an in-service training program for skill and knowledge development (**question 38**), with other in-service training being more ad hoc in the form of on-the-job training and skill and knowledge transfer. During the first two years of the COVID-19 pandemic, KGMIPiPK was hosting these trainings online. At KGMIPiPK, trainees also have the opportunity to choose a field to specialize in. A participant shared that “on-the-job training is feasible through e-learning and blended learning. This approach is usually most effective when

<sup>8</sup> Beyond purposes of monitoring, per capita funding is also extended to the function of coordinating scientific and technical progress at the national and oblast levels.



properly funded and expertly supported, in order to reach professionals at all levels, regardless of geographical location. More focus is required to improve the skills and knowledge of specialists in the use of distance learning tools, as well as to improve the infrastructure at the central level.” A participant shared that “The opportunity for a specialist to participate in in-service training programs, in my opinion, depends largely on the current employment/workload at a particular healthcare facility in a particular time period, as well as on the level of support and motivation by managers in the field (**question 39**).

A participant shared that they “hope that data on in-service trainings conducted are accumulated and regularly monitored at the MOH and KGMIPiPK level, which ultimately translates into the identification of real needs of specialists in the field (and the organizations they represent) for professional development based on current training needs on the implementation of NTP” (**question 40**).

The comments included in the group instruments for **questions 41–44** mentioned that there were divergent opinions within the group for these more subjective questions. The comments below are extracted from the individual instruments:

When asked if they feel their use of data for decision making is valued (**question 41**), one participant shared that they “participate, albeit not systematically, in data discussions and decision-making, but help in establishing a system for data use and decision-making at the NTP level is important.” Another participant shared that their “data access is very indirect due to the lack of this function by type of activity” but that they “clearly understand the great importance of having effective mechanisms for collecting and analyzing data (through the use of automated tools) for making quality decisions.”

When asked about how satisfied they were in their jobs (**question 42**), one respondent noted that “in the context of my involvement in the work on the use of data, I feel that national specialists, especially at the peripheral level, have no motivation for analysis, because this tends to lead to punishment by senior management for "bad" performance.” Another participant shared that “unfortunately, as part of my work in the organization that I represent at this seminar, I am rarely involved in events at the "program level" (where my experience and knowledge of an expert in the fields of IT, e-learning, system design and analytics could be in demand). Therefore, I am always open to new opportunities for professional growth on a part-time basis in any promising projects with in-demand expertise in the above aspects.”

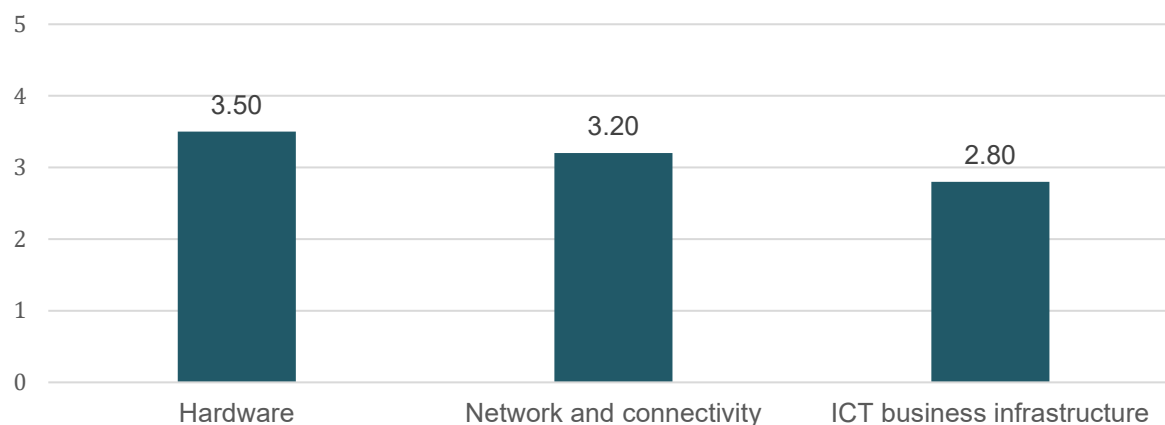
When asked how adequately they had been trained to use data for action (**question 43**), one respondent noted that “to analyze laboratory data, I use my knowledge of laboratory TB diagnostics, indicators of microscopic, culture and molecular genetic testing for TB, as well as general indicators of the quality of TB laboratories. Education, as a rule, is fragmentary and largely self-education (self-learning), i.e., with minimal opportunities for on-job training on TB (again, since this area is not the main one due to the type of activity).” Another respondent said it had been over 10 years since their last training.

Finally, when asked if there is a person they go to for support and mentorship (**question 44**), one respondent shared that the person they go to has “also not received special training in data use.”

### Domain 5: ICT

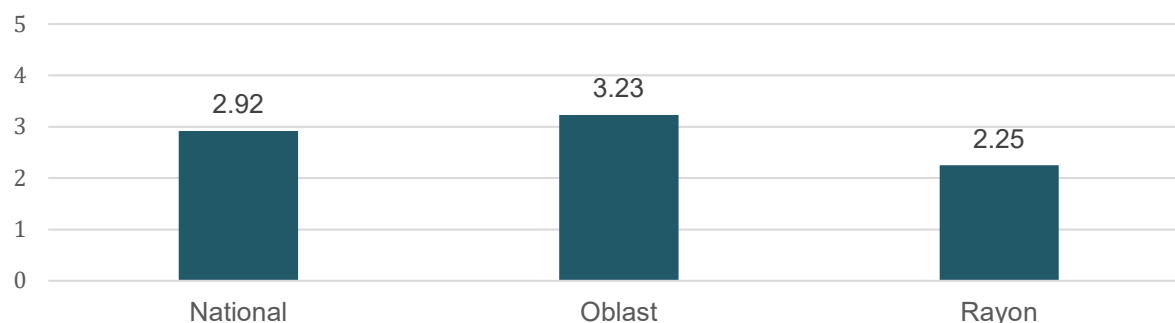
Domain 5, subdomain 1 (Hardware) received an aggregate score of 3.50; subdomain 2 (Network and connectivity) received an aggregate score of 3.20; and subdomain 3 (ICT business infrastructure) received an aggregate score of 2.80 (Figure 17).

**Figure 17. Domain 5 subdomain scores (aggregate of group responses)**



When looking at individual respondent data for domain 5, oblast-level participants gave higher scores, on average (3.23), whereas the rayon level was the most conservative (2.25). The national-level score was 2.92 (Figure 18).

**Figure 18. Domain 5 scores, by health system level (aggregate of individual responses)**



The qualitative findings for domain 5 (4 questions) were that hardware (**question 45**) is available in almost all laboratories, but there is not enough training of specialists in computer literacy. Oblasts are in charge of budgeting for their own hardware needs.

Regularity of hardware specification (**question 46**) varies from oblast to oblast, as it is budgeted locally. Terms of reference for equipment procurement are developed by various agencies for the NCPH.

Internet connectivity (**question 47**) is available in most sites, including in oblasts and districts. However, the quality can vary greatly, as it largely depends on the coverage of Internet providers in specific areas. In some areas, there is good coverage by cellular operators, whereas in others the services are provided via ADSL technology from Kyrgyz Telecom. Interruptions in connectivity may occur as a result of data plans not being paid on time.

For both hardware and connectivity, often in place thanks to technical support from international donor projects, the transition to a more sustainable basis needs to be thought through.

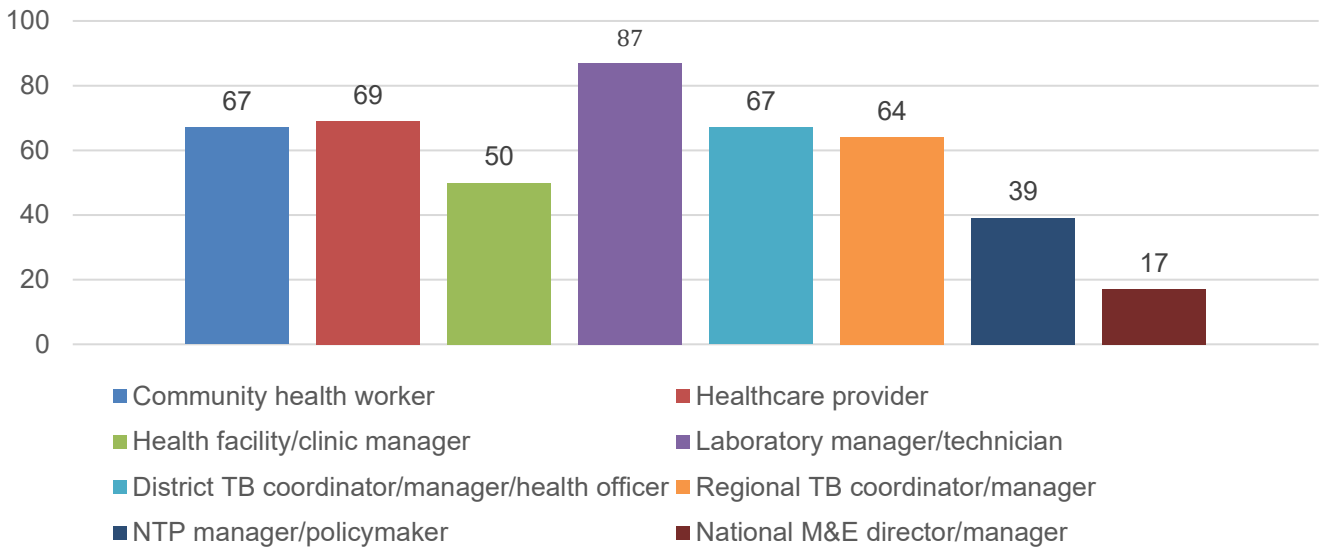
The level of ICT infrastructure varies from site to site. While it is quite strong at the central level, the regions and districts may encounter situations with insufficient availability of computer equipment and insufficient capacity to keep both hardware and software up-to-date (**question 48**). However, there is a widespread ability to send program data, reporting and analysis by email between national and subnational levels.

### **TB Users' Data Needs**

No participant identified with the roles of regional laboratory manager, national reference laboratory manager, and TB advocate (from civil society of the media). However, the eight other user roles outlined in the D2AC Toolkit were roles that participants identified with, and for which they answered the relevant user role questions. These questions can be found at the end of [Appendix E](#).

The range of responses for TB data needs met varied, with the national M&E director/manager reporting that only 17 percent of their TB data needs were being met, while the laboratory managers/technicians reported that 87 percent of their TB data needs were being met. However, most user groups were in the 64 to 69 percent category, including community health workers (67%), healthcare providers (69%), district TB coordinators (67%), and regional TB coordinator (64%) (Figure 19).

**Figure 19. Participants' perspectives on how well TB data needs are met, by user role**



Of these eight user role categories, only respondents identifying with the following four user roles provided qualitative responses: health facility/clinic manager, laboratory manager/technician, NTP manager, and National M&E director. Their comments are as follows:

Respondents identifying with the role of health facility/clinic manager provided the following comments regarding their TB data needs: for data needs involving TB case detection, based on the estimated prevalence, it was noted that there were difficulties in diagnosing vulnerable populations (migrants, unemployed, etc.) and juveniles, as well as extrapulmonary TB. It was also noted that active detection is a priority in the Kyrgyz Republic, and screening is done in groups based on risk factors. Furthermore, it was noted that “staffing problems can be seen everywhere” and that even though patients are being educated on TB prevention, the health literary is still lacking.

Respondents identifying with the role of laboratory manager/technician provided the following comments regarding their TB data needs: when asked if the laboratory has sufficient capacity to perform the expected number of tests based on estimated prevalence, it was noted that there was no Internet or a generator of uninterrupted power in some places and that Internet and power outages can occur, although the frequency or percentage of locations experiencing this was not noted. It was also noted that the NRL does have a quality indicator spreadsheet, as well as spreadsheets for personnel, equipment, reagents, and consumables for which data are tracked on a regular basis. There is a spreadsheet for forecasting and generating orders which supports the right tests being available in the right quantities and in the right places. In order to achieve efficient, quality, and available testing the test execution time is used as one of the main indicators for tracking efficiency, quality, and availability. However, at the current stage, some participants thought the data on the correctness of the diagnostic algorithm made effective monitoring of treatment very difficult to track. Regarding the existence of a laboratory referral network, it was noted that “the LDMIS database can be

used to track where the sample comes from and to which laboratory it is redirected, but statistical reports are currently under development in the LDMIS, so we cannot yet track data on sample referrals using the LDMIS but we can track this data using Excel databases, which at this stage are running in parallel with the LDMIS.”

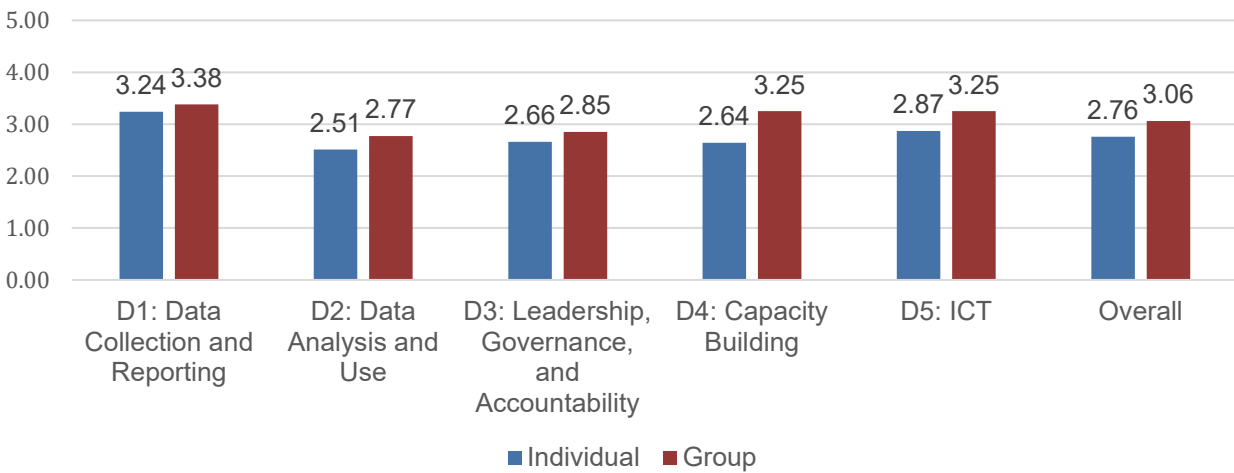
Respondents identifying with the role of NTP manager/policy maker provided the following comments regarding their TB data needs: TB detection at the PHC level is weak, as is adequacy of the coverage of TB diagnosis and treatment. It was also noted that there is no regular follow-up of the patient at the district level, and lack of adherence to treatment when asked if the distribution of drug-resistant TB in the country was adequately monitored. Furthermore, it was noted that the PHC level was not interested in or not measuring the adequacy of TB screening and diagnosis quality. Domestic funding for TB treatment and control is adequate and partially covered by donors. The quality of monitoring at regional and district levels was noted as “weak” when asked if adequate governance structures for TB M&E were in place. Regarding healthcare workers, it was noted that there is an absence of phthisiatricians in some districts and that quality of treatment monitoring at the PHC level was not always properly performed when it comes to assessing the performance of healthcare workers assigned to TB.

Respondents identifying with the role of national M&E director/manager provided the following comments regarding their TB data needs: data are collected for diagnostic purposes such as sputum microscopy and GeneXpert tests which are performed on patients with presumptive TB, thus providing an example for diagnostic system readiness. Progress towards targets (e.g., program review) are assessed every year at the national level and the performance of the recording and reporting systems (e.g., paper-based, electronic, mixed) are assessed every five years by WHO experts.

## **Comparing Individual and Group Results**

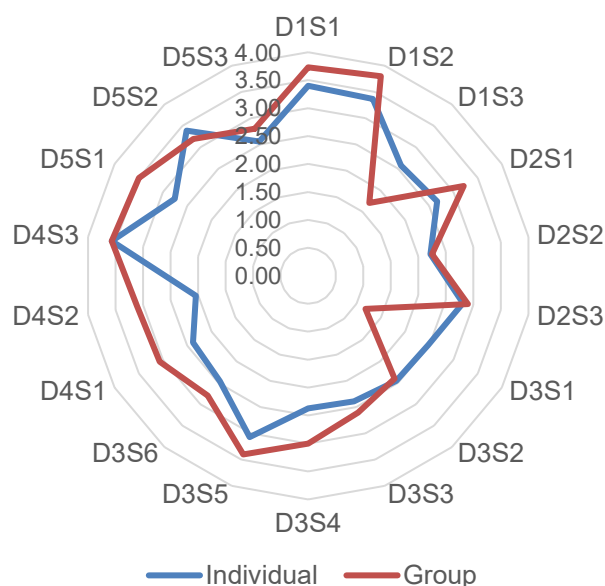
A comparison of the individual and group responses revealed that groups consistently scored higher than individuals across domains, with the biggest gap at 0.61 points for domain 4, and the smallest at 0.14 for domain 1 (Figure 20).

**Figure 20. Difference between individual and group results, by domain**



When examining individual and group differences at the subdomain level, the trend is also that group scores were overall higher than individual scores for most subdomains, with the exception of four subdomains—two where the difference is negligible such as D3S2 (0.05 point difference) and D5S2 (0.19 point difference)—and two where the difference is most striking: D1S3 (Data quality; 0.88 point difference) and D3S1 (Data use guidance; 1.30 point difference) (Figure 21). The latter two subdomains feature such a stark difference due to the discussions that occurred in plenary, where the scores for these two subdomains were debated, and where a hand-vote took place to reassess the Kyrgyz Republic’s level in answers to questions 10, 11, and 22 (see [Appendix E](#)).

**Figure 21. Difference between individual and group results, by subdomain**



### Co-Created Priority Actions

The count of individual votes resulted in five subdomains being identified as priority subdomains (receiving between 10 and 19 votes each). Six other subdomains received between 4 and 7 votes each, six subdomains received between 2 and 3 votes each, and finally, one subdomain received no votes at all (Table 6). The five priority subdomains were D1S3 (Data quality), D2S2 (Analytics and visualization), D3S5 (MEL), D4S2 (Skill and knowledge development), and D5S3 (ICT business infrastructure).

**Table 6. Number of votes by subdomain**

Subdomain		Votes
D1S3	Data quality	19
D2S2	Analytics and visualization	16
D4S2	Skill and knowledge development	16
D5S3	ICT business infrastructure	11
D3S5	Monitoring, evaluation, and learning	10
D5S2	Network and connectivity	7
D4S3	Decision making ability	6
D3S2	Data access and sharing	4
D3S3	Organizational structure and function	4
D3S4	Leadership and coordination	4

Subdomain		Votes
D2S3	Dissemination and communication	4
D3S6	Financial resources	3
D4S1	Data interpretation	3
D3S1	Data use guidance	3
D1S1	Data collection tools and workflow	2
D1S2	Reporting	2
D2S1	Data integration and exchange	2
D5S1	Hardware	0

For the five subdomains evaluated, the groups came up with 34 priority actions in a combined implementation plan ([Appendix G](#)).

For D1S3 (Data quality), three participants suggested that the priority actions should be to ensure that the electronic format for data collection and record-keeping and reporting forms is fully compliant, refine the electronic database, train oblast level staff on data quality review, develop standardized data quality checklists and data quality parameters for different levels, ensure regular linkage of inter-agency databases containing TB data, apply a standard data quality tool, and conduct an incident analysis and share feedback with data providers.

For D2S2 (Analytics and visualization), five participants suggested that the priority actions should be to develop an analytics and visualization manual, guidelines on data analysis and interpretation, and terms of reference for system developers; strengthen the capacity of staff on data analysis issues, improve the practical knowledge and technical skills in the use of automated tools, and encourage NTP staff to conduct in-depth analysis and develop visualization.

For D3S5 (MEL), five participants suggested that the priority actions should be to update the M&E manual, revise the M&E plan to reflect new recommendations, file for necessary funding to implement M&E activities, include M&E curriculum development costs in the estimate, organize training on the interpretation of received data, management, effective planning, and use of funds, and develop a plan of intersectoral meetings for M&E activities.

For D4S2 (Skill and knowledge development), five participants suggested that the priority actions should be to create a training program for data management and analysis, monitor and evaluate primary specialty programs for effectiveness and relevance and ensure that the NTP offers opportunities for staff to receive this kind of training, and organize trainings and seminars related to data collection and management.

For D5S3 (ICT business infrastructure), four participants suggested that the priority actions should be to develop normative legal documents, SOPs, ICT guidelines, a training plan at the level of medical schools, and to provide ongoing technical support for ICT business infrastructure.



## Discussion

The June 2022 D2AC assessment in the Kyrgyz Republic shed light on the perceived weaknesses of the Kyrgyz TB information system, namely in the areas of data analysis and visualization (data use guidance specifically) and data quality. Upon reveal of the aggregate group score, some comments were raised concerning the perceived high score achieved by Kyrgyz in the subdomains of data quality and data use guidance. These two areas were subject to score revisions in plenary—a discussion followed by a hand re-voting process so that the score more accurately reflected the level of the TB system for these subdomains. These areas received scores lower than 2 out of 5, meaning that they were identified as being at a “nascent” stage on the continuum.

The D2AC assessment in Kyrgyz Republic shed light on the areas that were performing the best. The strongest-performing areas were data collection and reporting practices. Other strong areas were data integration and exchange, MEL, decision making ability, and hardware. These areas received scores superior to 3 out of 5, meaning that they were identified as being at an “established” stage on the continuum. No subdomain received an average score at the “institutionalized” stage of the continuum. It should be noted that decision making ability was among the highest performing subdomains, even when considering the individual score (3.57) instead of the group score (3.75), which seemed more representative of individual opinion.

The D2AC records data in two ways: individual and group responses. The individual responses provided an opportunity for workshop participants to orient themselves to the content of the tool and engage in forethought on the maturity of the various capabilities, subdomains, and domains. The group-level exercise provided an opportunity for participants to derive a consensus view following discussion among themselves. The group-level results should be considered the more reasoned responses, given that a post hoc analysis of group constitution yielded reassurance that the appropriate background and experience were present in the groups. The individual responses could be used to validate the group responses if they were not substantially different (that is, if they were similar, it could be reasonably assumed that the group responses reflected the actual maturity of the system). If individual and group responses differed significantly, a comparison of individual and group responses at the capability and subdomain level could provide insight on the disparity. For example, the comparison may reveal that individual respondents lacked significant background or experience, or it could bring to light an overly influential group member. Differences in individual versus group responses do not indicate bias in the responses per se, rather, the potential for such that should be evaluated further and rectified, if possible.

## Recommendations

The recommendations are presented in two parts. The first part discusses recommendations developed in plenary and by consensus by all workshop participants. They are described in detail in the implementation plan ([Appendix G](#)). The second part presents, in greater breadth, recommendations that apply to the Kyrgyz Republic context. They are based on the average scores in the D2AC data collection instrument, and were both generated from the priority actions for implementation tab in the D2AC Data Analysis Tool and inspired by the group discussions during the workshop.

### Priority Recommendations from Combined and Validated Implementation Plan

As previously mentioned, the priority recommendations were developed in small groups, combined in a joint implementation plan in plenary, and validated by the workshop participants.

The recommendations can be summarized in four broad categories. First, participants recommended developing and implementing the following **trainings to be held**: data verification (for oblast coordinators), reporting form completion process (for district TB specialists), TB case definitions, clinical symptoms, treatment monitoring, and prevention measures (for district TB doctors), data analysis and interpretation (for health workers, managers, partners), technical skills for the use of electronic tools (all staff working with data), and management and effective financial planning (managerial staff). Second, participants also compiled a host of **materials to be developed**: standardized quality checklists for all levels, analytics and visualization manual, guidelines for data analysis and interpretation, terms of reference for data analysis for system developers, instructions for compiling electronic forms, data quality parameters, plan for intersectoral meetings on M&E, M&E manual (update), normative legal documents including SOPs and an ICT guideline, and training plans for managerial staff and for medical institutions. Third, participants reflected on areas where **monitoring was to be ensured**: compliance of electronic forms, regular linkage of databases containing TB data, funding for and inclusion of M&E curricula and activities, reviewing staff schedules in the monitoring units, evaluating effectiveness of primary specialty training programs, exploring opportunities for staff incentives for specialization, providing technical support for ICT, and refining the electronic database and data entry system. Last, participants suggested three types of **evaluations to be conducted**: a data quality assessment, a cascade analysis, and an incident analysis.

The 34 detailed priority recommendations can be found in [Appendix G](#).

### Other Recommendations, by Domain and Subdomain from the D2AC Toolkit and Group Feedback

This section lists the benchmarks and recommendations generated by the D2AC Toolkit's Priority Actions for Implementation function based on the subdomain scores, combined with the recommendations shared by the groups in small group discussions and in plenary.

## Domain 1: Data Collection and Reporting

For **D1S1 (Data collection tools and workflow, score of 3.73)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. Standardized electronic data collection tools are used at all levels and integrated with the national HMIS data collection system.
2. The inventory information is used to inform the need for a new TB data collection system.
3. Data collection processes are monitored and assessed to check alignment with the service delivery guidance.
4. Unique identifiers for TB cases are aligned with the national unique (person or patient) identifiers.
5. The NTP web-based site list is integrated in the master facility list.
6. NTP monitoring and review assesses quality of disaggregated data collection.

To reach an institutionalized level, the specific recommendations are to:

1. Complete the scale up of electronic data collection tools by building capacity for electronic data collection in sites identified as “in need” on the readiness assessment (e.g., by ensuring adequate electricity, providing computer hardware, training, ensuring maintenance). Gradually build capacity and scale up until all sites are using the electronic tools. Integrate standardized electronic tools into the national HMIS.
2. Make available and maintain a complete inventory of data sources with content details.
3. Institute a system of formal review, and periodic monitoring, of data collection processes to ensure alignment with service delivery guidance (as reflected in the policies and priorities in the TB Strategic Plan).
4. Conduct a review of the harmonized system of unique IDs in service delivery sites to ensure the system is effective at correctly identifying the correct individuals across TB services within sites (diagnosis, treatment, follow-up), across sites (program, testing, pharmacy), and eliminating duplication.
5. Integrate the NTP site list into the HMIS master facility list. Verify attribute data and consolidate records. Ensure TB sites are labeled as offering TB services, including type of service. Note where other sites from the MFL are offering TB-related services, like screening, diagnostics, or referrals to treatment.
6. Institute a regular appraisal of disaggregated data collection needs and compare with requirements published in the M&E plan. Amend M&E plan as necessary to ensure it is up-to-date with M&E needs in disaggregated data. Suggested frequency is at the beginning of the TB Strategic Plan, and again at mid-term review.

For **D1S2 (Reporting, score of 3.80)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. Standardized electronic data reporting tools are used at all levels and integrated into the national HMIS.
2. NTP monitoring and review assesses quality of disaggregated data reporting.

3. Data reporting processes are monitored and assessed to check alignment with TB service delivery guidance.

To reach an institutionalized level, the specific recommendations are to:

1. Use standardized electronic data reporting tools at national and district levels for aggregate data reporting. (For example, a TB-specific database into which paper-based forms from health facilities are entered. Data reported to higher levels are typically transmitted electronically and combined with results from other district to create regional and national totals.)
2. Ensure the NTP routinely reviews and updates disaggregate data reporting requirement in the M&E plan. Institute a regular appraisal of disaggregated data collection needs and compare with requirements published in the M&E plan. Amend M&E plan as necessary to ensure it is up to date with M&E needs in disaggregated data. Suggested frequency is at the beginning of the TB Strategic Plan, and again at mid-term review. This should be implemented in conjunction with efforts to assess needs for disaggregation of data in data collection tools (D1S1\_6).
3. Ensure that routine NTP guidance revision/update guides the revision of data reporting processes.

For **D1S3 (Data quality, score of 1.70)**, the requirements to go from a nascent to a defined level on the D2AC are the following:

1. Data quality parameters are clearly defined and documented by NTP.
2. Application of standard data quality tool is limited to donor-funded programs.

To reach a defined or, better yet, established level, the specific recommendations are to:

1. Clearly define and document data quality parameters.
2. Apply standard data quality tool.
3. Document data biases and adjusted in analysis for data to be comparable across sources and time.
4. Integrate data quality metrics into program review and are a routine feature of program management.

## **Domain 2: Data Analysis and Use**

For **D2S1 (Data integration and exchange, score of 3.21)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. A standard-based central data repository collates data from all the TB data collection systems.
2. All data exchange between systems at points of service for TB cases and reporting and/or central repositories is automated with adequate budgetary resources in the program to meet custom requirements.
3. All data exchange between systems at points of service for laboratory testing and reporting and/or central repositories is automated and integrated with the national health data exchange (if it exists).
4. The national TB data management and exchange standards are integrated in the national HIS and/or health plan.

To reach an institutionalized level, the specific recommendations are to:

1. Collate data from all the TB data collection systems in a standard-based central data repository.
2. Exchange data with adequate budgetary resources in the program to meet custom requirements all automated.
3. Automate all data exchange and integrate with the national health data exchange (if it exists).
4. Integrate the national TB data management and exchange standards into the national HIS and/or health plan.

For **D2S2 (Analytics and visualization, score of 2.25)**, the requirements to go from a defined to an established level on the D2AC are the following:

1. NTP staff are able to conduct advanced analysis (e.g., cascade analysis) and develop visualization in real-time mostly at the national level.
2. The NTP has identified and documented a minimum set of standard data analyses and visualizations requirements/needs at all levels.
3. Decision making is focused only on program resources and/or patient data reports and summaries.  
Some decision support tools exist locally or for specific implementations.
4. Decision-support tools are automated to use the knowledge base for contextually relevant reference information.

To reach an established level, the specific recommendations are to:

1. NTP staff conduct advanced analysis (e.g., cascade analysis) and develop visualization in real-time mostly at the national level.
2. Document data analysis and visualization requirements/needs to support NTP decision making.
3. Ensure that program staff routinely make decisions that require combining data from multiple sources (e.g., to provide scenario-based, health-system level specific decision-making support, and predict the impact of decisions and policy).
4. Make certain that decision support tools incorporate guidelines (both program and clinical) and exist locally or for specific implementations.

For **D2S3 (Dissemination and communication, score of 2.90)**, the requirements to go from a defined to an established level on the D2AC are the following:

1. An approved communication strategy is being implemented but confined to the national level.
2. Targeted information products are disseminated in multiple formats (print, digital) using electronic and web-based platforms at higher levels.

To reach an established level, the specific recommendations are to:

1. Implement an approved communication strategy even if confined to the national level.
2. Routinely produce/distribute information products to stakeholders at all levels of the health system.

### Domain 3: Leadership, Governance, and Accountability

For **D3S1 (Data use guidance, score of 1.18)**, the requirement to go from a nascent to a defined level on the D2AC is the following:

1. The NTP uses data use guidance to manage its data use activities at various levels.

To reach a defined or, better yet, established level, the specific recommendations are to:

1. Monitor and assess the implementation of data use guidance by the national governing/leadership body.
2. Guarantee the NTP leverages data use guidance to manage its data use activities at various levels.

For **D3S2 (Data access and sharing, score of 2.40)**, the requirement to go from a defined to an established level on the D2AC is the following:

1. Access-based control and data sharing agreements are established to allow access to and sharing of NTP data within and outside the NTP.

To reach an established level, the specific recommendation is to:

1. Establish access-based control and data sharing agreements to allow access to and sharing of NTP data within and outside the NTP.

For **D3S3 (Organizational structure and function, score of 2.60)**, the requirement to go from a defined to an established level on the D2AC is the following:

1. NTP staff at all levels have access to their written role and responsibilities related to data use.

To reach an established level, the specific recommendation is to:

1. Ensure that NTP staff at all levels have access to their written role and responsibilities related to data use.

For **D3S4 (Leadership and coordination, score of 3.00)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. A formal leadership and coordination team is an integral part of the NTP review and assessment process.
2. The monitoring, evaluation, and learning (MEL) team monitors and assesses ability of leadership and coordination team to lead and coordinate regularly scheduled meetings.

To reach an institutionalized level, the specific recommendations are to:

1. Make a formal leadership and coordination team an integral part of the NTP review and assessment process.
2. Ensure that the monitoring, evaluation, and learning (MEL) team evaluates and monitors the ability of the leadership and coordination team to lead and coordinate regularly scheduled meetings.

For **D3S5 (MEL, score of 3.40)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. The MEL plan implementation is monitored and reviewed as part of the program/strategy review.

2. Routine health outcome assessment and evaluation is conducted to measure improvement in individual and population level health outcomes.
3. MEL processes are routinely reviewed as part of the NTP performance review.
4. The MEL data are used to monitor, measure, and improve program data use at all levels.

To reach an institutionalized level, the specific recommendations are to:

1. Implement an approved MEL plan with adequate budget allocation at the national level.
2. Use health outcome measurement data to revise and prioritize program interventions.
3. Routinely review MEL processes as part of the NTP performance review.
4. Use the MEL data to monitor, measure, and improve program data use at all levels.

For **D3S6 (Financial resources, score of 2.80)**, the requirements to go from a defined to an established level on the D2AC are the following:

1. Operations of data use activities have been secured with annual budgets.
2. The NTP has a comprehensive financial plan that diversifies funding (resources from NTP, donors, and private sector) in place.

To reach an established level, the specific recommendations are to:

1. Secure operations of data use activities with annual budgets.
2. Ensure that the NTP has a comprehensive financial plan that diversifies funding (resources from NTP, donors, and private sector) in place.

#### **Domain 4: Capacity Building**

For **D4S1 (Data interpretation, score of 3.07)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. Performance of data use forums is monitored and assessed as part of the program performance review.
2. MEL staff routinely monitor and assess implementation of actions identified in the data review.
3. Supportive supervision is monitored to help identify technical resources NTP staff can access to meet supportive supervision needs.

To reach an institutionalized level, the specific recommendations are to:

1. Monitor and assess the performance of data use forums as part of the program performance review.
2. Ensure that MEL staff routinely monitor and assess implementation of actions identified in the data review.
3. Certify that NTP staff receives supportive supervision for data use at the national level.

For **D4S2 (Skill and knowledge development, score of 3.11)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. Pre-service training programs are monitored and assessed for their effectiveness and relevance.
2. The NTP offers opportunities and incentives to promote pre-service training of potential staff.
3. In-service training programs are monitored and assessed for their effectiveness and relevance.

4. Training institutions offer opportunities and incentives to promote continuous education of staff at all levels.
5. Assessment of training programs is routinely conducted as part of the MEL activities to gauge skill and knowledge of trainees.

To reach an institutionalized level, the specific recommendations are to:

1. Monitor and assess pre-service training programs for their effectiveness and relevance.
2. Ensure that the NTP offers opportunities and incentives to promote pre-service training of potential staff.
3. Monitor and assess the in-service training programs for their effectiveness and relevance.
4. Ensure that a designated NTP authority oversees in-service training programs.
5. Routinely assess the training programs as part of the MEL activities to gauge skill and knowledge of trainees.

## Domain 5: ICT

For **D5S1 (Hardware, score of 3.50)**, the requirements to go from an established to an institutionalized level on the D2AC are the following:

1. Hardware needs are monitored and assessed at all levels and is conducted annually as part of the program performance review.
2. Hardware specifications are supported by adequate budget in the program plan.

To reach an institutionalized level, the specific recommendations are to:

1. Routinely update and address hardware needs for the program through annual program planning.
2. Document and follow hardware specifications in procurement at all levels.

For **D5S2 (Network and connectivity, score of 3.20)**, the requirement to go from an established to an institutionalized level on the D2AC is the following:

1. Network and Internet connectivity needs are routinely monitored and assessed to identify and address gaps to support programmatic data collection, reporting, and analysis.

To reach an institutionalized level, the specific recommendation is to:

1. Routinely monitor and assess network and Internet connectivity needs to identify and address gaps to strengthen the TB HIS.

For **D5S3 (ICT business infrastructure, score of 2.80)**, the requirement to go from a defined to an established level on the D2AC is the following:

1. An ICT operations and maintenance plan is being implemented at the national level.

To reach an established level, the specific recommendation is to:

1. Implement an ICT operations and maintenance plan at the national level.



## Conclusion

Despite progress toward ending TB worldwide, combating TB remains a high priority in the Kyrgyz Republic, especially in the COVID-19 era infection rates among health workers in the country has been high<sup>9</sup> which has contributed to a scarcity of TB services in a context where Kyrgyz Republic still faces among the world's highest burdens for MDR/RR-TB. The D2AC assessment in Kyrgyz Republic highlighted both the high-performing elements of the NCPH's data use capabilities and the challenges that should be addressed to improve evidence-based decision making. The assessment revealed good performance in certain dimensions of the D2AC, such as data collection and reporting, MEL, and hardware. However, it also revealed important gaps, such as standardized data quality parameters, guidelines, exercises, and rigorous data use guidance. These findings provide evidence of the areas needing programmatic interventions, and can also inform policymakers, donors, and program managers who want to design and implement responsive programs and interventions to strengthen and improve data use capabilities for evidence-based decision making to provide targeted and informed high-quality services for all TB patients and their families.

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<sup>9</sup> <https://www.jsi.com/using-covid-to-spur-tb-program-innovations-in-the-kyrgyz-republic-ainura-ibraimova-shares-her-reflections/>

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## Appendix A. D2AC Kyrgyz Republic Workshop Agenda

<b>Wednesday, June 1, 2022</b> <b>D2AC Assessment Workshop Day 1</b> <b>Location: Novotel City Center, Bishkek</b>		
<b>Time</b>	<b>Description</b>	<b>Participants</b>
8:30–9:00	Registration, welcome tea-coffee	
9:00–9:45	Welcome Workshop opening addresses Introductions	Totugul Murzabekova Kyrgyz NTP Leadership Jeanne Chauffour/Meredith Silver All
9:45–10:30	Workshop Overview	Jeanne/Meredith Totugul/Aibike
10:30–12:30	Introducing the D2AC assessment approach and Toolkit	Jeanne/Meredith Totugul/Aibike
12:30–13:30	Lunch	
13:30–14:45	Step 1: Individual review of D2AC Toolkit	All (individually)
14:45–15:15	Tea break	
15:15–16:45	Step 2: Present individual data Closing	Jeanne/Meredith Totugul/Aibike
<b>Thursday, June 2, 2022</b> <b>D2AC Assessment Workshop Day 2</b> <b>Location: Novotel City Center, Bishkek</b>		
<b>Time</b>	<b>Description</b>	<b>Participants</b>
8:30–9:00	Registration, welcome tea-coffee	
9:00–9:15	Welcome, day one recap and overview of day two	Jeanne/Meredith Totugul/Aibike
9:15–10:45	Step 3: Group work (building on individual review information)	All (in groups)
10:45–12:00	Step 4: Plenary discussion on group work	All (group leads) Facilitator: Aibike/Totugul
12:00–13:00	Lunch	
13:00–14:00	Step 4: Plenary discussion on group work (continue)	All (group leads) Facilitator: Aibike/Totugul

14:00–14:45	Step 5: Presentation of aggregate group assessment data	All Facilitator: Jeanne/Meredith Totugul/Aibike
14:45–16:00	Step 6: Plenary discussion on aggregate data	All Facilitator: Aibike/Totugul
16:00–16:30	Tea break and closing	
<b>Friday, June 3, 2022</b> <b>D2AC Assessment Workshop Day 3</b> <b>Location: Novotel City Center, Bishkek</b>		
<b>Time</b>	<b>Description</b>	<b>Participants</b>
8:30–9:00	Registration, welcome tea-coffee	
9:00–9:30	Welcome, day two recap and overview of day three	Jeanne/Meredith Totugul/Aibike
9:30–10:15	Step 7: Identify priority action items	All (individually)
10:15–12:00	Step 8: Draft implementation plan for priority action items	All (in groups)
12:00–13:00	Lunch	
13:00–14:30	Step 8: Discuss implementation plan and next steps	All (group presentations) Facilitator: Aibike/Totugul
14:30–15:30	Closing words and acknowledgments Certificate ceremony	Totugul Kyrgyz NTP Leadership USAID Jeanne Chauffour/Meredith Silver

## Appendix B. D2AC Kyrgyz Republic Workshop Participants

**Table B1. Workshop participant list**

Names of participants appear in alphabetical order by last name.

Name	Affiliation	Role
Elmira Abdrakhmanova	National Center of Phthisiology	Head of Department of Informatics and epidemiology
Nestan Askarova	Chuy oblast TB center	Head of M&E department
Venera Alymkulova	Department of Disease Prevention and State Sanitary and Epidemiological Surveillance (SES)	Epidemiologist
Rakhat Cholurova	USAID/Cure TB project	Technical director
Irina Gubankova	National Center of Phthisiology	DR-TB coordinator Department of Informatics and epidemiology
Maria Idrisova	USAID/STAR	NTP advisor
Rakhat Ismanbaeva	USAID	M&E specialist
Altyn Iskakova	National Center of Phthisiology	Laboratory doctor Republican Reference Laboratory
Ainura Kadyralieva	USAID/Cure TB project	M&E specialist
Gulmira Kalmambetova	National Center of Phthisiology	Head of Republican Reference Laboratory
Kadyrbek Kantemirov	Chuy oblast TB center	Drug Management Coordinator
Zamira Karasartova	Republican TB hospital “Kara-Balta”	Head of Kara-Balta Republican TB Hospital
Aizat Kulzhabaeva	KNCV-KG	Epidemiologist, MER
Bolot Kyrbashov	National Center of Phthisiology	MIS coordinator Department of Informatics and epidemiology
Zhanyl Kyzalakova	Chuy oblast TB center	Deputy Director for therapeutic work
Gulshan Mataeva	National Center of Phthisiology	Laboratory coordinator Republican Reference Laboratory
Aisuluu Nueva	General Medicine Practice Center Ysyk-Ata rayon	Laboratory specialist
Cholpon Nurbaeva	Bishkek city TB center	Deputy Director for therapeutic work
Cholpon Nurgazieva	National Center of Phthisiology	M&E coordinator Department of Informatics and epidemiology
Dinara Pakirova	Bishkek city TB center	Drug Management Coordinator
Nurbek Tentiev	World Health Organization	IT specialist
Saadat Sagyndykova	National Center of Phthisiology	Drug supply coordinator Department of Informatics and epidemiology
Merbubu Sydykova	USAID/Cure TB project	Project specialist
Atyrkul Toktogonova	National Center of Phthisiology	Deputy Director of the NCPH for Scientific Work

Name	Affiliation	Role
Kunduz Toktorgazieva	National Center of Phthisiology	Head of the therapeutic department № 2
Salia Turganova	Chuy oblast TB center	Laboratory specialist
Zhyldyz Yskakova	General Medicine Practice Center Tokmok city	TB physician
Irina Yushenko	Bishkek city TB center	Head of M&E department

**Table B2. Workshop participant characteristics**

Participant information		Percentage and count	
Gender	Men	11% (n=3)	
	Women	89% (n=25)	
Level	Central	NTP	36% (n=10)
		Other government	3% (n=1)
		Partners	25% (n=7)
		All (subtotal)	64% (n=18)
	Oblast	14% (n=4)	
	Rayon	11% (n=3)	
	Health facility	11% (n=3)	
Roles affiliated with USAID TB pillars	Reach	64% *	
	Cure	40% *	
	Prevent	52% *	
	Sustain	64% *	
Years of work experience	0–5	14% (n=4)	
	5–10	21.5% (n=6)	
	10–15	21.5% (n=6)	
	15–20	-	
	20+	32% (n=9)	
	Unknown	11% (n=3) †	
Individual instrument responses		89% (n=25) †	
Participated in group instrument		79% (n=22) †	

\* No *n* is provided here because participants were able to identify with more than one pillar (and up to all four pillars), so the percentages illustrate representativeness of each pillar. Only 25 of the 28 participants (those who completed the individual instrument) provided responses.

† participants who only attended one or two days of the workshop are also included in these totals; and some participants were not in attendance to submit an individual instrument and/or to join a group for the group instrument submission

## Appendix C. D2AC Toolkit Kyrgyz Republic Country Profile

Demographic, Geographic, and Socioeconomic Features		Response	Year	Source
<b>Demographic</b>				
Area/size of the country (km <sup>2</sup> )		199,9	N/A	
Notable borders		Kazakhstan, Uzbekistan, Tajikistan, China	N/A	
Estimation of population size		6.579 million	2020	World Bank Data <sup>1</sup>
<b>Administrative structure</b>				
Regions/provinces/states (#)		7 provinces/regions	2020	N/A
Districts/councils/counties (#)		2 indent cities	2020	N/A
Service delivery sites	Facility-based (#)	1750	2019	National Stat committee <sup>2</sup>
	Community-based (#)			
<b>Socioeconomic features</b>				
United Nations classification		Lowermiddle income	N/A	
Population below the poverty line		1.678 million	2020	CABAR <sup>3</sup>
	Rural (%)	29.3%	2020	Poverty, Food Security and Nutrition Analysis in the Kyrgyz Republic Report by the WFP <sup>4</sup>
	Urban (%)	11%	2020	Poverty, Food Security and Nutrition Analysis in the Kyrgyz Republic Report by the WFP <sup>4</sup>
Major revenue sources		industrial exports, gold reserves, mercury, uranium, agriculture	2022	Encyclopedia Britannica <sup>5</sup>
<b>TB Epidemiologic Burden and Trends</b>		<b>Response</b>	<b>Year</b>	<b>Source</b>
TB mortality rate		4.6 cases per 100,000 pop	2020	World Data Atlas <sup>6</sup>
TB incidence		6,900 ( per 100,000 pop)	2020	WHO TB Global Report 2021 <sup>7</sup>
TB case notification rate		4,885	2020	WHO TB Global Report 2021 <sup>7</sup>
TB treatment coverage		62%	2020	WHO TB Global Report 2021 <sup>7</sup>
TB treatment success rate		81%	2020	WHO TB Global Report 2021 <sup>7</sup>
MDR/RR-TB incidence		1,359	2019	WHO TB Global Report 2021 <sup>7</sup>
MDR/RR-TB treatment enrollment rate		946	2020	WHO TB Global Report 2021 <sup>8</sup>
XDR-TB incidence		97	2019	WHO TB Global Report 2021 <sup>7</sup>
HIV coinfection rate		220,0	2020	STOP TB Partnership Kyrgyz Republic Country Profile <sup>9</sup>
TPT coverage		48%	2020	WHO TB Global Report 2021 <sup>7</sup>
<b>WHO impact indicators</b>				
Reduction in TB incidence rate (compared with 2015)		136 p 100,000 (2015); 105 p 100,000 (2020) = 31 difference	2020	World Bank Data <sup>10</sup>

Reduction in TB deaths (compared with 2015)		8.5 per0,000 (2015); 5.8 per0,000 (2020) = 2.7 dfference	2020	WHO TB Global Report 2021 <sup>11</sup>
TB-affected families facing catastrophic costs dues to TB (%)		Not avlable		
<b>NTP Laboratory and Workforce Capacity</b>		<b>Response</b>	<b>Year</b>	<b>Source</b>
Laboratory centers (#)				
Total number of laboratories conducting TB diagnosis (#)		108	2020	WHO TB Global Report 2021 <sup>11</sup>
	Microscopy centers	131	2014	WHO TB Global Report 2021 <sup>11</sup>
	GeneXpert sites	24	2019	WHO TB Global Report 2021 <sup>11</sup>
	Culture laboratories	7	2020	WHO TB Global Report 2021 <sup>11</sup>
	Reference laboratories	1	2018	NTP <sup>12</sup>
Does a lab referral network exist? (Yes/No)		Yes	2014	WHO TB Global Report 2021 <sup>11</sup>
Human resources				
NTP staff supported by government (#)		219	2019	National Stat committee <sup>13</sup>
NTP M&E staff supported by government (#)		98	2021	NTP
Resources allocated toward M&E or TB M&E (\$)		N/A		
TB/HIV officers recruited under partner's support absorbed into payroll (%)		N/A		
<b>TB Health Financing</b>		<b>Response</b>	<b>Year</b>	<b>Source</b>
WHO recommended level for the country		16.1 mllion	2020	STOP TB Partnership Kyrgyz Republic Dashboard <sup>9</sup>
TB treatment is free (Yes/No)		Yes		N/A
People eligible for exemptions who receive those exemptions (%)				
Proportion of population with TB who received social protection under the national health insurance scheme (%)		Totalountry beneficiaries 661,0 - how many have TB?	2016	World Bank <sup>14</sup>
Proportion of health budget allocated to TB services (%)		13 mllion	2020	WHO TB Global Report 2021 <sup>15</sup>
Proportion of annual TB budget funded by donors (%)		39%	2020	WHO TB Global Report 2021 <sup>7</sup>
Proportion of domestic TB financing (%)		61%	2020	WHO TB Global Report 2021 <sup>7</sup>
Proportion of cases that led to catastrophic costs due to TB (%)		Not avlable		
<b>Research and Development</b>		<b>Response</b>	<b>Year</b>	<b>Source</b>
Proportion of national TB budget allocated to research				
Surveys and research being conducted (e.g., prevalence surveys). Please provide name, year, and implementing/financing entity.				



- <sup>1</sup> <https://data.worldbank.org/indicator/SP.POP.TOTL?end=2020&locations=KG&start=2000&view=chart>
- <sup>2</sup> TB facilities plus PHC (FGP&FAP) with TB service
- <sup>3</sup> <https://cabar.asia/en/pandemic-unleashes-new-wave-of-poverty-in-kyrgyzstan-and-the-world#:~:text=In%202020%2C%201%20million%20678,per%20cent%20of%20rural%20residents.>
- <sup>4</sup> <https://reliefweb.int/sites/reliefweb.int/files/resources/WFP-0000133148.pdf>
- <sup>5</sup> <https://www.britannica.com/place/Kyrgyzstan/People#ref73582>
- <sup>6</sup> <https://knoema.com/atlas/Kyrgyzstan/topics/Health/Risk-factors/Tuberculosis-death-rate#:~:text=In%202020%2C%20tuberculosis%20death%20rate,per%20100%2C000%20people%20in%202020.>
- <sup>7</sup> [https://worldhealthorg.shinyapps.io/tb\\_profiles/?\\_inputs\\_&entity\\_type=%22country%22&lan=%22EN%22&iso2=%22KG%22](https://worldhealthorg.shinyapps.io/tb_profiles/?_inputs_&entity_type=%22country%22&lan=%22EN%22&iso2=%22KG%22)
- <sup>8</sup> <https://app.powerbi.com/view?r=eyJrljoiZDhjNDM0YmMtOGExOS00ODIxLWEzMjktZDk0NmI4YTAwODgwiwidCI6ImY2MTBjMGI3LWJkMjQtNGlzOS04MTBiLTNkYzI4MGFmYjU5MCIslmMiOjh9>
- <sup>9</sup> [https://www.stoptb.org/static\\_pages/KGZ\\_Dashboard.html](https://www.stoptb.org/static_pages/KGZ_Dashboard.html)
- <sup>10</sup> <https://data.worldbank.org/indicator/SH.TBS.INCD?end=2020&locations=KG&start=2015>
- <sup>11</sup> <https://www.who.int/teams/global-tuberculosis-programme/data>
- <sup>12</sup> [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0008/364814/php-4-1-1201-lab-capacities-eng.pdf](https://www.euro.who.int/__data/assets/pdf_file/0008/364814/php-4-1-1201-lab-capacities-eng.pdf)
- <sup>13</sup> <http://stat.kg/ru/statistics/zdravooхранenie/>
- <sup>14</sup> <https://www.worldbank.org/en/news/press-release/2013/05/03/kyrgyz-republic-continues-health-and-social-protection-reforms>
- <sup>15</sup> <https://app.powerbi.com/view?r=eyJrljoiMGlwZDUzMmItODE5Yi00YjAzLTliMGVhMGVlYzA4YWVkiwidCI6ImY2MTBjMGI3LWJkMjQtNGlzOS04MTBiLTNkYzI4MGFmYjU5MCIslmMiOjh9>

## Appendix D. D2AC Toolkit Glossary

Term	Definition
ad hoc	Arranged or happening when necessary and not planned in advance.
aggregate data	Compilation of individual data systems and data that could result in the totality of the information being classified and stratified at a higher level.
algorithm	A process or a set of rules to be followed in calculations or other problem-solving operations, especially by a computer; a common term used to show decision trees for diagnostic or treatment procedures (e.g., treatment algorithm; diagnostic algorithm).
aligned	The fit between the data flow and data collection or program goals and data analysis and data collection.
analytics	The process of discovering, interpreting, and communicating significant patterns in data.
capacity building	Capacity building focuses on strengthening the skills and knowledge of personnel, the management and governance of a program or project, and organizational infrastructure.
cascade analysis	Cascades are frameworks for monitoring gaps in program services needed to achieve goals and health outcomes.
case-based data	Patient-level data for a series of key or sentinel (reportable) events, used to measure and monitor the incidence, progression, and outcome of a disease.
central data repository	A centralized place to store and maintain data ( <i>see standards-based central data repository for more information</i> ).
client	An individual who is a potential or current user of health services; may also be referred to as a patient or beneficiary.
commodities	A raw material that can be bought and sold.
communication strategy	An outlined method used for exchanging information that can be visual, verbal, or in written form. A plan to achieve communications objectives internal or external.
data	A reinterpretable representation of information in a formalized manner suitable for communication, interpretation, or processing (e.g., a sequence of bits, a table of numbers, the characters on a page, and the recording of sounds made by a person speaking).
data analysis	The examination of acquired data for its significance and probative value to the case.
data audit	A guided inspection of an organization's health data registries and forms, typically by an independent body.
data collection system	A computer application that facilitates the process of data collection, allowing specific, structured information to be gathered in a systematic fashion, subsequently enabling data analysis to be performed on the information.
data element	A basic unit of information that has a unique meaning and subcategories (data items) of distinct value (e.g., gender, race, and geographic location).
data exchange	The process of taking data structured under a source schema and transforming it into a target schema, so that the target data are an accurate representation of the source data. Data exchange allows data to be shared between different computer programs.
data governance	A set of processes that ensures that data assets are formally managed throughout the healthcare system. A data governance model establishes authority, management, and decision-making parameters related to the data produced or managed by the healthcare system.

Term	Definition
data quality parameters	Dimensions used to examine, evaluate, and improve data quality— they include accuracy (are the data collected and reported in a manner by which the data are to be trusted because they are a reflection of the reality, [i.e., there are no omissions or duplicates]?), timeliness (are the data collected, cleaned, reviewed, or reported according to issued protocol and guidance?), completeness (are the data submitted complete, and are all the variables and indicator data fields properly filled out?), among others.
data quality reviews	A process whereby data and associated data files are assessed and required actions are taken to ensure that files are independently understandable for informed reuse. This is an active process involving a review of the files, documentation, the data, and the code.
data reporting tools	The paper and electronic tools used to transfer collected or received data to a higher level in an organized, streamlined, and consistent manner.
data source	The location from which the data being used originates and can include primary, secondary, and tertiary data sources.
data use	Instances where data are currently reviewed, updated, processed, erased, accessed, or ready to inform a recommendation for action in strategic planning, policymaking, program planning and management, advocacy, or delivering services.
data use forum	An event, series of events, or space (physical or virtual) dedicated to and gathering multiple actors in data use activities, practices, and exercises (e.g., quarterly data review and use meetings; online discussion groups/listservs).
decision making	The selection of a course of action from among two or more possible alternatives in order to arrive at a solution for a given problem.
decision support tools	Electronic applications to assist decision makers by providing evidence-based knowledge in the context of clinical decision making (e.g., decision tree, drug interaction alerts at the time medication is prescribed or reminders for specific guideline-based interventions during the care of patients with chronic disease) or policy/program decision making (e.g., dashboards or scorecards to help guide policy/program decisions).
descriptive analysis	Statistical techniques used to summarize and describe a data set, and also the statistics measures used in such summaries.
disaggregate data	Breaking down of data into smaller groupings, often based on such characteristics as sex, income, or racial/ethnic group.
exchange standards	Refers to the exchange of information according to a set of standards. Standards are agreed on methods for connecting systems together and may pertain to security, data transport, data format or structure, or the meaning of codes or terms.
evaluation	The systematic assessment of an ongoing or completed intervention to determine whether the intervention is fulfilling its objectives and to demonstrate an effect on health outcomes.
function	The functionality of a system is how well the system works when examining it against relevant documents that describe the conceptual design of the system(s).
guideline	A general rule, principal, or piece of advice.
health information system (HIS)	The HIS provides the underpinnings for decision making and has four key functions: data generation, compilation, analysis and synthesis, and communication and use. The HIS collects data from the health sector and other relevant sectors, analyzes the data, ensures their overall quality, relevance, and timeliness, and converts data into information for health-related decision making.
indicator	A quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement.

Term	Definition
information and communications technology (ICT)	The means employed to provide access to information through Internet, wireless networks, cell phones, and other communication media.
information products	Data that has been compiled, managed, and analyzed becoming evidence that can be used by decision makers.
in-service training program	Training concurrent to official responsibilities for improving professional qualifications or skills. Can be compulsory related to official professional development activities to maintain or upgrade professional qualifications or it can be optional for the sole purpose of improving skills.
in source documents	Documents from which data were originally collected (i.e., facility registers and tally sheets).
integration	The inter-connectivity requirements needed for two applications to securely communicate data to and receive data from another.
inventory	An itemized list of current information system/digital assets.
master facility list	A standard mechanism for uniquely identifying health facilities, which allows for information to be compared across time and across data sources for individual facilities.
mandate	An official order or commission to do something.
monitoring	The process of collecting and analyzing routinely collected data to compare how well an intervention is being implemented against expected results and measure changes in performance over time.
monitoring and evaluation plan	Describes and manages the process of assessing and reporting progress toward achieving project outputs and outcomes, and to identify what evaluation questions will be addressed through evaluation.
national health management system (HMIS)	A system whereby health data are recorded, stored, retrieved, and processed to improve decision making.
operational/ operationalized	In use or ready for use/put into use.
points of service	Of, relating to, or being a healthcare insurance plan that allows enrollees to seek care from a physician affiliated with the service provider at a fixed co-payment or to choose a nonaffiliated physician and pay more.
policy	A course or principal of action adopted or proposed by a government, party, business, or individual/a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions.
pre-service training program	Recognized and organized programs designed to train future professionals to formally enter the profession at a specified level of education.
procedures	An established or official way of doing something.
process	Services that the program provides to accomplish its objectives, such as outreach activities, curriculum development, materials developed, counseling sessions, workshops, and training events.
real-time data entry	Data that are not kept or stored, but are passed along/delivered to the end user immediately after being collected.

Term	Definition
requirements (for data analysis and visualization)	Necessary components for bringing order and structure to collected data and putting data into a chart, graph, or other visual format that helps inform analysis and interpretation.
retrospective (data entry)	Data recorded, or the process of recording data, later than the period or moment at which they should have been recorded (e.g., updating patient charts or registers days after the patient visit, when guidance instructs to update the charts and registers immediately following the patient visit).
scenario	A set of simple statements that summarize what the end-user needs the digital health intervention to do.
standard operating procedures (SOPs)	A set of descriptive directions that ensure the correct development of specific activities and processes.
stakeholder	Any person or party with an interest in the financing, implementation, or outcome of a service, practice, process, or decision made by another (e.g., healthcare, health policies).
standardize	Standardized measures are nationally recognized criteria for evaluating the quality of healthcare provided to patients. These measures are endorsed or developed by organizations, specialty medical boards, national accreditors, or government agencies.
standardized electronic data collection tools	A streamlined ensemble of digital data collection tools meant to be used in a consistent manner across a territory or system, as opposed to ad hoc or misaligned systems that make data difficult to compare or combine.
standards	Accepted methods or models of practice; they may be formally approved or de facto standards.
standards-based central data repository	A data bank or data warehouse, centrally managed, which stores and merges data with standardized definitions and terminology from existing databases so that these data can be accessed, shared, integrated, analyzed, reported, or updated as required.
supportive supervision	A process of helping staff improve their own work performance continuously, carried out in a respectful and non-authoritarian way with a focus on using supervisory visits as an opportunity to improve knowledge and skills of health staff and provide feedback.
synthesize (data)	A process of combining data into a coherent whole with the aim of drawing conclusions.
TB service delivery workflows (or just workflows)	A repeatable pattern of activity that can be organized with adequate resources, defined roles, and information and feed into a process that can be documented and learned.
unique identification	An identifier that is guaranteed to be unique among all identifiers; a long-lasting reference that allows for continued access to a digital object for a specific purpose.
visualization (data)	The representation of data in charts, infographics, video graphics, and dashboards or other images.

## Appendix E. D2AC Data Collection Instrument

The highlighted sentences correspond to the average group response (except for questions 41–44 which correspond to the average individual response). The User Roles questionnaire can be found at the end.

Domain 1	Data collection and reporting
Subdomain (D1S1)	Data collection tools and workflows
Definition	The tools/devices/instruments and processes used for the ongoing systematic data collection to support analysis, interpretation, and sharing of data according to the National TB Program (NTP) guidelines for TB treatment, prevention, and control.
<b>1. To what extent are standardized electronic data collection tools used?</b>	
1	Non-standardized paper-based tools are the primary tools for data collection at all levels.
2	Standardized paper-based data collection tools are the primary tools for data collection at all levels.
3	Standalone standardized electronic data collection tools are often used, including for retrospective data entry, at higher levels.
4	Standardized electronic data collection tools are used at all levels and integrated with the national health management information system (HMIS) data collection system.
5	National HMIS data collection system is used for real-time data entry.
<b>2. Do you have an inventory of TB data collection systems (clinical, lab, commodities, training)?</b>	
1	There is an ad hoc list of TB data collection system.
2	A list of all the TB data collection systems exists but information about its data and users is limited to the national level.
3	A complete inventory of all the TB data collection systems, its data, and target users is available with the NTP.
4	The inventory information is used to inform the need for a new TB data collection system.
5	TB data collection system inventory is routinely updated to add information about a new TB data collection system.
<b>3. To what extent are data collection processes aligned with TB service delivery guidance?</b>	
1	Data collection is ad hoc or mainly driven by donor or external stakeholder mandate for data collection.
2	Some data collection processes align with service delivery guidance.
3	Data collection processes are aligned with the TB service delivery guidance.
4	Data collection processes are monitored and assessed to check alignment with the service delivery guidance.
5	Data collection process monitoring and assessment findings guide revisions and updates.
<b>4. To what extent is unique identification used for TB cases?</b>	
1	Unique identification is absent or rarely used to identify TB cases.
2	Some TB program sites use their own unique identifiers to identify TB cases.
3	The NTP uses unique identifiers for TB cases across program sites.

4	Unique identifiers for TB cases are aligned with the national unique (person or patient) identifiers.
5	The NTP ensures use of unique identifiers to track and treat TB cases across all TB sites (program, testing, pharmacy).
<b>5. To what extent is the NTP site list standardized and in what format is it?</b>	
1	The NTP site list is absent or only includes site names.
2	The NTP has an electronic site list but it is incomplete.
3	The NTP has a web-based site list (similar to a master facility list) that is complete.
4	The NTP web-based site list is integrated into the master facility list.
5	The NTP web-based site list is routinely reviewed and updated together with the national master facility list.
<b>6. How is data disaggregation (e.g., by sex or age, treatment/retreatment, drug-resistant/drug susceptible) addressed in data collection?</b>	
1	Data are rarely or inadequately disaggregated in the site level data collection.
2	Data collection tools (paper or digital) and processes allow disaggregation of data but disaggregate data are not collected.
3	NTP guidance require collection of disaggregate data.
4	NTP monitoring and review assesses quality of disaggregated data collection.
5	The NTP routinely reviews and updates disaggregate data collection requirement in the monitoring and evaluation (M&E) plan.

<b>Domain 1</b>	<b>Data collection and reporting</b>
<b>Subdomain (D1S2)</b>	<b>Reporting</b>
Definition	The tools/devices/instruments and processes used for the ongoing systematic data reporting to support analysis, interpretation, and sharing of data according to the NTP guidelines for TB treatment, prevention, and control.
<b>7. To what extent are standardized electronic data reporting tools used?</b>	
1	Non-standardized paper-based tools are the primary tools for reporting at all levels.
2	Standardized paper-based reporting tools are used at all levels.
3	Standalone standardized electronic data reporting tools are used at national and district levels for aggregate data reporting, at higher levels.
4	Standardized electronic data reporting tools for aggregate data (i.e., not real time) are used at all levels and integrated into the national HMIS.
5	Standardized real time (e.g., case-based or point of service data entry) electronic data reporting tools are used.
<b>8. How is data disaggregation (e.g., by sex or age, treatment/retreatment, drug-resistant/drug susceptible) addressed in reporting?</b>	
1	Data are rarely or inadequately disaggregated in the site level reporting.
2	Data reporting tools (paper or digital) and processes allow disaggregation of data but data are incomplete or rarely collected.
3	NTP guidance require reporting of disaggregate data.
4	NTP monitoring and review assesses quality of disaggregated data reporting.
5	The NTP routinely reviews and updates disaggregate data reporting requirement in the M&E plan.

<b>9. To what extent are data reporting processes aligned with TB service delivery guidance?</b>	
1	Data reporting is ad hoc or mainly driven by donor or external stakeholder mandate for reporting.
2	Some data reporting processes align with TB service delivery guidance.
3	Data reporting processes are aligned with the TB service delivery guidance.
4	Data reporting processes are monitored and assessed to check alignment with TB service delivery guidance.
5	Data reporting processes are routinely updated based on NTP service delivery guidance revisions.

<b>Domain 1</b>	<b>Data collection and reporting</b>
<b>Subdomain (D1S3)</b>	<b>Data quality</b>
Definition	The accuracy, completeness, timeliness, consistency, reliability, and integrity of data.
<b>10. To what extent is data quality assurance defined and applied in NTP data systems?</b>	
1	Data quality is defined and measured in an ad hoc manner.
2	Data quality parameters are clearly defined and documented by NTP.
3	Data quality assessments are routinely conducted for priority indicators.
4	Data quality problems are documented and factored in data analysis to be comparable across sources and time.
5	High quality data (complete, consistent, and accurate) are available for at least the priority indicators for the last two years or more.
<b>11. To what extent has the NTP integrated data quality assurance into standard practice?</b>	
1	Data quality is not checked or ad hoc and non-standardized data quality assessments are conducted.
2	Data quality assessments are limited to donor-funded programs.
3	The NTP conducts routine standardized data quality assessments for both in-source documents at the facility and for the reported data.
4	The NTP uses data quality assessment findings to improve the data and capacity to collect and report good quality data.
5	Data quality limitations identified in data quality assessments are routinely factored in the evaluation of program performance and management (e.g., program review).

<b>Domain 2</b>	<b>Data analysis and use</b>
<b>Subdomain (D2S1)</b>	<b>Data integration and exchange</b>
Definition	The mechanism for transforming and integrating data from multiple sources into a target destination environment; can also refer to the activities of matching, merging, and deleting records within a single data store.
<b>12. To what extent has a central data repository been developed?</b>	
1	The NTP lacks central data repository(ies) (e.g., a national reporting system, a TB case report repository) where TB case report data are analyzed/reported to (at case or aggregate level).
2	The system requirements for a central data repository are documented but not implemented.



3	An electronic central data repository collates aggregate program data only at national level.
4	A standard-based central data repository collates data from all the TB data collection systems.
5	The central data repository is routinely used by NTP stakeholders to address program data analytics and visualization needs.
<b>13. To what extent are there data exchange processes between systems at points of service for TB cases and reporting and/or central repositories currently in place?</b>	
1	Data exchange processes are missing or are limited and require manual intervention.
2	There is some data exchange at the national level but limited automated exchange.
3	Data exchange occurs extensively on a national level and is mostly automated.
4	All data exchange is automated with adequate budgetary resources in the program to meet custom requirements.
5	All data exchanges are automated, resourced, and no specialized engineering efforts or expertise is needed to meet new requirements.
<b>14. To what extent are there data exchange processes between systems at points of service for laboratory testing and reporting and/or central repositories currently in place?</b>	
1	Data exchange processes are missing or are limited and require manual intervention.
2	There is some data exchange at the national level but limited automated exchange.
3	Data exchange occurs extensively on a national level and is mostly automated.
4	All data exchange is automated and integrated with the national health data exchange (if it exists).
5	All data exchanges are automated, integrated, and no specialized engineering efforts or expertise are needed to meet new requirements.
<b>15. To what extent are exchange standards (interoperability and/or health data standards, e.g., XML, JSON, LOINC, FHIR) integrated into the data exchange implementation?</b>	
1	No defined technical standards exist for use in the TB data management and exchange but may exist for other diseases or HIS activities.
2	The country has adopted and/or developed standards for TB data management and exchange, but standards may be localized to specific projects.
3	Standards for TB data management and exchange are approved and require certification of new exchange partners for compliance.
4	The national TB data management and exchange standards are integrated in the national HIS and/or health plan.
5	TB data management and exchange standards are tracked, monitored, and reviewed through a standardized process.

<b>Domain 2</b>	<b>Data analysis and use</b>
<b>Subdomain (D2S2)</b>	<b>Analytics and visualization</b>
Definition	The use of analytics and visualization techniques/tools to provide new insights and patterns from data analysis to stakeholders at different levels to enhance health and healthcare decision making.
<b>16. To what extent are users able to conduct analysis and develop visualization?</b>	
1	Basic or no knowledge/skill exists to conduct analysis and develop visualization.

2	NTP staff can conduct descriptive analysis and generate some visualization (tables, graphs, charts, etc.) to make comparisons and evaluate trends.
3	NTP staff are able to conduct advanced analysis (e.g., cascade analysis) and develop visualization in real-time mostly at the national level.
4	NTP staff at national, subnational, and facility levels are able to conduct advanced analysis (e.g., cascade analysis) and develop visualization in real-time (e.g., for identifying causes of poor performance, implementation problems, and monitor and forecast services/commodities demand) as part of the M&E activities.
5	NTP staff can develop customized analytics and visualization using the central data repository (e.g., to monitor stock availability and forecast demand at all levels).
<b>17. To what extent are analytics and visualization requirements documented?</b>	
1	Data analysis and visualization requirements/needs are missing or ad hoc.
2	Data analysis and visualization requirements/needs are documented to support NTP decision making.
3	The NTP has identified and documented a minimum set of standard data analyses and visualizations requirements/needs at all levels.
4	The NTP's analytics and visualization requirements are monitored and budgeted in the NTP plan.
5	The NTP routinely updates analytic and visualization needs using monitoring data.
<b>18. To what extent are data sources used?</b>	
1	Decision making is informal or only one data source is used for decision making.
2	Some guidance is available that explains how multiple data sources support decision making.
3	Decision making is focused only on program resources and/or patient data reports and summaries. Some decision support tools exist locally or for specific implementations.
4	Program staff routinely make decisions with data incorporated from multiple sources (e.g., to provide scenario-based, health-system level specific decision making support, and predict the impact of decisions and policy).
5	Advanced models, used for decision making, incorporate multiple data sources (including the central data repository) to optimize and influence TB health outcomes.
<b>19. To what extent are decision support tools used?</b>	
1	The need for decision support tools has yet to be identified.
2	Decision support tools need is documented and exist locally or for specific implementations.
3	Decision support tools are automated to use the knowledge base for contextually-relevant reference information.
4	Assessments to ensure the knowledge relevance, value, and accuracy of decision support algorithms are conducted on a regular schedule.
5	Assessment findings are used for continuous improvement of decision support algorithms (in terms of relevance of information and accuracy).

<b>Domain 2</b>	<b>Data analysis and use</b>
<b>Subdomain (D2S3)</b>	<b>Dissemination and communication</b>
Definition	The analyzed data are synthesized and can be shared in appropriate visualizations, understood, and used by the target audience.
<b>20. To what extent is a communication strategy in place?</b>	
1	Communication is informal and lacks documented communication strategy.
2	A documented national communications strategy is in place but not operationalized.
3	An approved communication strategy is being implemented but confined to the national level.
4	Implementation monitoring and assessment are routinely conducted to gauge the effectiveness of the communication strategy as part of the NTP review.
5	A communication strategy and its implementation are adjusted based on the assessment findings.
<b>21. To what extent are information products developed and subsequently disseminated?</b>	
1	Development and sharing of information products are ad hoc or driven by specific program needs.
2	Dissemination of information products is typically limited to senior-level decision makers.
3	Targeted information products are disseminated in multiple formats (print, digital) using electronic and web-based platforms at higher levels.
4	Information products are routinely produced and distributed to stakeholders at all levels of the health system is monitored and evaluated.
5	Information product dissemination is improved using monitoring and evaluation data.

<b>Domain 3</b>	<b>Leadership, Governance, and Accountability</b>
<b>Subdomain (D3S1)</b>	<b>Data use guidance</b>
Definition	The process, procedures, and actions of an organization associated with collection and sharing of their data.
<b>22. Does the NTP have a data use guidance?</b>	
1	The need for policies that govern data use at health system levels has been identified but no such guidance exists.
2	The NTP uses data use guidance to manage its data use activities at various levels.
3	The NTP has an approved and comprehensive data use guidance implemented at all health system levels to support data use for decision making.
4	Implementation of data use guidance is monitored and assessed by the national governing/leadership body.
5	The NTP's data use guidance is annually reviewed and updated using the monitoring data.

<b>Domain 3</b>	<b>Leadership, Governance, and Accountability</b>
<b>Subdomain (D3S2)</b>	<b>Data access and sharing</b>
Definition	The disclosure of data from one or more organizations to another organization(s), or the sending of data between different parts of a single organization. This can take the form of routine data sharing, where the same data sets are shared between the same organizations for an on-going established purpose and exceptional, one-off decisions to share data for a specific purpose or shared with external stakeholders.
<b>23. What is the data access and sharing status within NTP and with external stakeholders?</b>	
1	The NTP lacks a data sharing mechanism.
2	Data access and sharing processes and methods are mostly documented but data are shared mainly through email.
3	Access-based control and data sharing agreements are established to allow access to and sharing of NTP data within and outside the NTP.
4	Access-based control and data sharing agreement implementation is monitored to ensure compliance with data use guidance/policy.
5	The NTP uses monitoring data to support access to and sharing of data with all relevant stakeholders (e.g., NTP, external stakeholders).

<b>Domain 3</b>	<b>Leadership, Governance, and Accountability</b>
<b>Subdomain (D3S3)</b>	<b>Organizational structure and function</b>
Definition	The organizational structures and processes, including job titles and clear descriptions of duties and responsibilities with a focus on data management, data quality, data governance, data analytics, data integration, and exchange.
<b>24. To what extent are data use roles and responsibilities documented for NTP staff?</b>	
1	Job descriptions are absent or lack data use roles and responsibilities.
2	Job descriptions clearly document data use roles and responsibilities but only at the national level.
3	NTP staff at all levels have access to their written role and responsibilities related to data use.
4	Supervisor(s) regularly review staff data use roles using the job description to offer constructive feedback.
5	Supervisor(s) follow NTP guidelines to review and update data use roles and responsibilities of staff.

<b>Domain 3</b>	<b>Leadership, Governance, and Accountability</b>
<b>Subdomain (D3S4)</b>	<b>Leadership and coordination</b>
Definition	The exercise of technical, political, and administrative authority to manage the NTP at all levels of a country's health system. The leadership and coordination structure consists of the mechanisms, processes, and institutions through which actors and stakeholders (both internal and external) articulate their interests, exercise their rights, meet their obligations, mediate their differences, and oversee the performance of the NTP.
<b>25. To what extent is the interagency leadership and coordination team (including internal and external stakeholders) structure developed?</b>	
1	The leadership and coordination team structure is informal or ad hoc.
2	Some formal leadership and coordination team structure with a clearly-defined scope of work exists.

3	A formal leadership and coordination team is managing implementation of the data use policy and data access and sharing guidance with attention to gender and equity.
4	A formal leadership and coordination team is an integral part of the NTP review and assessment process.
5	The formal leadership and coordination team facilitates an annual review of TB data use activities at all levels of the health system and decisions are evident in the updated program/guidance documents.
<b>26. To what extent is the leadership and coordination team effective?</b>	
1	An informal leadership and coordination team meets at the national level.
2	Meetings are held periodically among individual health system levels, but there is no standard operating procedure (SOP) related to meeting management.
3	Leadership and coordination team meetings occur on a periodic, regular schedule across the health system levels with SOPs to follow related to meeting management.
4	The monitoring, evaluation, and learning (MEL) team monitors and assesses ability of leadership and coordination team to lead and coordinate regularly scheduled meetings.
5	Assessment findings are used to improve leadership and coordination team meeting outcomes.

<b>Domain 3</b>	<b>Leadership, Governance, and Accountability</b>
<b>Subdomain (D3S5)</b>	<b>Monitoring, evaluation, and learning (MEL)</b>
Definition	A plan supporting management of program activities and informing the organization about what activities to implement, timeline, resources, responsible party, and whether and how an activity is contributing toward stated NTP goals including equity and inclusion.
<b>27. To what extent is the MEL plan implemented?</b>	
1	MEL activities are informal or ad hoc.
2	An MEL guidance document exists but is only accessible at the national level.
3	An approved MEL plan with adequate budget allocation is being implemented at the national level.
4	The MEL plan implementation is monitored and reviewed as part of the program/strategy review.
5	Monitoring data are used to inform the annual review/update of the MEL plan.
<b>28. To what extent does MEL contribute to improved health outcomes?</b>	
1	Health outcomes are yet to be defined or lack standardized outcome parameters.
2	Some health outcomes are defined and monitored at the national level.
3	Health outcome parameters are documented and monitored at all the levels.
4	Routine health outcome assessment and evaluation is conducted to measure improvement in individual and population level health outcomes.
5	Health outcome measurement data are used to revise and prioritize program interventions.
<b>29. To what extent are MEL processes developed?</b>	
1	MEL processes are ad hoc.
2	MEL processes are documented but project- or intervention-focused.

3	MEL processes are documented and aligned with the data collection and reporting at all levels.
4	MEL processes are routinely reviewed as part of the NTP performance review.
5	Program performance review findings are used to routinely revise/update MEL processes.
<b>30. To what extent does MEL support program improvement?</b>	
1	MEL is informal and relies on individual experiences.
2	MEL data are sometimes used to monitor implementation and program performance.
3	Leadership and coordination team(s) uses MEL data at the national level for program review and course correction.
4	The MEL data are used to monitor, measure, and improve program data use at all levels.
5	The MEL data are used to continuously improve the MEL plan for achieving better program goals.

<b>Domain 3</b>	<b>Leadership, Governance, and Accountability</b>
<b>Subdomain (D3S6)</b>	<b>Financial resources</b>
Definition	The legal and administrative systems and procedures in place that permit a government ministry and its agencies and organizations to conduct activities that ensure the correct use of public funds and that meet defined standards of probity and regularity. Activities include management and control of public expenditures, financial accounting, reporting, and asset management (in some cases).
<b>31. To what extent are data use activities funded in the NTP budget?</b>	
1	Budget for data use activities is absent or ad hoc.
2	Budget for data use activities is allocated but tied with specific interventions/projects.
3	Operations of data use activities have been secured with annual budgets.
4	Budget for data use activities is monitored and reviewed during the program review process.
5	Monitoring and review findings are used to revise/update the budget allocated to data use activities.
<b>32. How are financial resources mobilized?</b>	
1	Availability of financial resources is ad hoc or specific to interventions.
2	Financial resource needs are documented for national level data use activities.
3	The NTP has a comprehensive financial plan that diversifies funding (resources from NTP, donors, and private sector) in place.
4	Availability and utilization of financial resources is monitored and measured by the MEL team.
5	The leadership and coordination team revises financial plan using the monitoring data to align with the national TB goals.

<b>Domain 4</b>	<b>Capacity building</b>
<b>Subdomain (D4S1)</b>	<b>Data interpretation</b>
Definition	The organizational structure and individual ability that enables reading, writing, and communicating data in context, including an understanding of data sources and constructs, analytical methods, and techniques applied — and the ability to describe the use case, application, and resulting value.
<b>33. To what extent are data use forums (e.g., monthly or quarterly program review meetings) developed?</b>	
1	Data use forums are missing or ad hoc.
2	Data use forums with terms of reference are convened, but only at the national level.
3	Data use forums with approved terms of reference are operational at all levels.
4	Performance of data use forums is monitored and assessed as part of the program performance review.
5	Monitoring and assessment findings are used to improve performance of data use forums.
<b>34. How often are data reviewed and by whom?</b>	
1	Data review by program staff are rare or ad hoc.
2	Program staff review data at the national level for specific program implementation.
3	Program staff routinely conduct data review at all levels using the data use forums to identify corrective action.
4	MEL staff routinely monitor and assess implementation of actions identified in the data review.
5	Monitoring and assessment data are used to continuously improve implementation of actions identified in the data review.
<b>35. Is NTP staff receiving supportive supervision for practicing data use?</b>	
1	NTP staff receive ad hoc supervision support for data use.
2	NTP staff receive program specific supervision and mentoring to take action on reported findings from indicators.
3	NTP staff receive supportive supervision for data use at the national level.
4	Supportive supervision is monitored to help identify technical resources NTP staff can access to meet supportive supervision needs.
5	NTP staff can mentor/coach peers on data use.

<b>Domain 4</b>	<b>Capacity building</b>
<b>Subdomain (D4S2)</b>	<b>Skill and knowledge development</b>
Definition	The availability of adequate personnel with characteristics, attributes, and capabilities to perform a task(s) pertaining to data system, data quality, data analytics, and data use to achieve clearly defined results.
<b>36. To what extent has the NTP developed a national pre-service training program for skill and knowledge development?</b>	
1	A national pre-service training program to impart knowledge and skills is ad hoc.
2	A national pre-service training program for imparting knowledge and skills exist but only for clinical staff.
3	A national pre-service training program for all cadres of the NTP is being implemented.
4	Pre-service training programs are monitored and assessed for their effectiveness and relevance.

5	The pre-service training program is routinely updated using the monitoring and assessment data.
<b>37. To what extent are institutions offering pre-service training established in the NTP guidance?</b>	
1	Institutions offering pre-service training are identified in an ad hoc manner.
2	Pre-service training is conducted by government and/or private training institutions.
3	A designated NTP authority oversees pre-service training programs.
4	The NTP offers opportunities and incentives to promote pre-service training of potential staff.
5	Institutions and their pre-service training offerings are identified based on the NTP strategic goals.
<b>38. To what extent has the NTP developed an in-service training program for skill and knowledge development?</b>	
1	A national in-service training program to impart knowledge and skills is ad hoc.
2	A national in-service training program for imparting knowledge and skills exist but only for clinical staff.
3	A national in-service training program for all cadres of the NTP is being implemented.
4	In-service training programs are monitored and assessed for their effectiveness and relevance.
5	The in-service training program is routinely updated using the monitoring and assessment data.
<b>39. To what extent are institutions (both public and private) offering in-service training established in the NTP guidance?</b>	
1	Opportunities for in-service training offered by institutions other than the NTP are limited.
2	In-service training is conducted by government and/or private training institutions.
3	A designated NTP authority oversees in-service training programs.
4	Training institutions offer opportunities and incentives to promote continuous education of staff at all levels.
5	Institutions and their offerings are identified based on the program review findings.
<b>40. How effective are the in-service training programs?</b>	
1	In-service training offerings are not effective.
2	In-service training offerings are aligned with training needs but only at the national level.
3	Training needs assessment data are used for identification and recommending appropriate trainings.
4	Assessment of training programs is routinely conducted as part of the MEL activities to gauge skill and knowledge of trainees.
5	Training assessment data are used to improve design and delivery of targeted in-service training programs.

<b>Domain 4</b>	<b>Capacity building</b>
<b>Subdomain (D4S3)</b>	<b>Decision making ability</b>
Definition	Individual stakeholder's autonomy, capabilities, and motivation to use data for action.
<b>41. Do you feel your use of data for decision making inputs are valued?</b>	
1	My responsibilities do not include using data for decision making.



2	My responsibilities include using data for decision making, however I do not have access to data.
3	I have access to data but I do not feel empowered or encouraged to use the data for decision making.
4	I feel like my input to my colleagues around decision making is often taken into consideration and valued, but I am not often encouraged to make decisions myself.
5	I feel like my input is often taken into consideration and valued, and that I am almost always able and encouraged to make decisions based on the available data.
<b>42. How satisfied do you feel by your job?</b>	
1	I feel discouraged because my job often does not seem to matter.
2	I feel my job is important but the work environment is unsatisfactory.
3	I enjoy and find interest in my work and I feel valued in my team but I do not feel I have many opportunities for growth.
4	I feel that I work in an encouraging environment that promotes growth and the development of skills I need to perform well.
5	I feel that I work in an encouraging environment that promotes growth and learning, and I am rewarded for strong performance (e.g., incentives).
<b>43. How adequately have you been trained to use data for action?</b>	
1	I have never received training specific to data use.
2	I have only received informal training on data use (e.g., on-the-job training from a colleague).
3	I have received formal training on data use but it was neither pertinent nor recent.
4	I have received formal training that was pertinent to data use at my level, but over two years ago.
5	I have received formal training that was pertinent to data use at my level, and within the last two years.
<b>44. Is there a person you go to for support and mentorship?</b>	
1	I do not have a colleague (e.g., knowledgeable peer or mentor) to whom I can go to for support for data use.
2	I have identified a colleague whom I would like to work with more closely for data use support, but I have not reached out for support yet.
3	I have a colleague knowledgeable about my responsibilities and skills but I cannot regularly turn to them for support for questions related to data use (e.g., due to their unavailability).
4	I have a colleague knowledgeable about my responsibilities and skills with whom I am increasingly collaborating and sharing knowledge about data use.
5	I have a colleague knowledgeable about my responsibilities and skills whom I can regularly turn to for support and who provides feedback based on best practices in data use.

<b>Domain 5</b>	<b>Information and communications technology (ICT)</b>
<b>Subdomain (D5S1)</b>	<b>Hardware</b>
Definition	An assembly of tangible physical parts of a system of computers, including servers and virtual private networks (VPN), that provide services to a user in the health information ecosystem. E.g., computers, printers, connecting devices.
<b>45. To what extent does the NTP have adequate hardware?</b>	
1	The NTP has few computers to support it or hardware is dedicated to specific TB HIS activities.

2	Less than half of the NTP's central and subnational offices have adequate hardware.
3	Hardware needs are documented national offices have adequate hardware, including backup services.
4	Hardware needs are monitored and assessed at all levels and is conducted annually as part of the program performance review.
5	Hardware needs for the program are updated and addressed routinely through annual program planning.
<b>46. To what extent are hardware specifications developed and budgeted?</b>	
1	No guidance exists on the minimum hardware specifications for TB data system.
2	Hardware specifications are documented at the national and subnational levels.
3	Hardware specifications are documented and followed in procurement at all levels.
4	Hardware specifications are supported by adequate budget in the program plan.
5	Hardware specifications are routinely updated based on the program data analytics, visualization, and data exchange needs.

<b>Domain 5</b>	<b>Information and communications technology (ICT)</b>
<b>Subdomain (D5S2)</b>	<b>Network and connectivity</b>
Definition	Network is the disparate elements of a system connected in a way that data and information can be shared among all elements. Connectivity is the ability to access the data in the system.
<b>47. To what extent does Internet and Internet connectivity exist at NTP sites?</b>	
1	No network and Internet connectivity exists or is limited to the national level.
2	Network and Internet connection exist at the national level and about half of subnational offices have a reliable network and Internet connection.
3	Adequate dedicated network and Internet connectivity exist at the national and subnational level sites.
4	Network and Internet connectivity needs are routinely monitored and assessed to identify and address gaps to support programmatic data collection, reporting, and analysis.
5	All or almost all of the NTP national and subnational sites have reliable network and Internet connections supported by a dedicated technology support team.

<b>Domain 5</b>	<b>Information and communications technology (ICT)</b>
<b>Subdomain (D5S3)</b>	<b>ICT business infrastructure</b>
Definition	Design and planning, operations management, and technical support for information and communications technology (ICT) infrastructure maintenance.
<b>48. To what extent has ICT infrastructure been developed?</b>	
1	There is basic or no support for ICT or electronic systems equipment installation and maintenance related to the TB HIS.
2	There is a recognized need to standardize processes to oversee and support ICT infrastructure, but no established or harmonized process exists specific to HIS needs.
3	An ICT operations and maintenance plan is being implemented at the national level.

4	Data are collected and regularly reviewed on the ICT infrastructure operations and maintenance plan as mandated by the NTP strategic plan.
5	The ICT operations and maintenance plan is continuously reviewed and adapted based on the review data.

User group	#	Data Need	Need met by TB information system?
<b>Community health worker</b>	1	Is TB screening in the community effective (i.e., finding the expected number of cases)?	Yes/No
	2	Are case contacts being traced and investigated effectively for all index TB cases?	Yes/No
	3	Are people with presumptive TB being referred effectively to the nearest health facility (for laboratory test and further evaluation for TB)?	Yes/No
	4	Is TB treatment being administered effectively to TB patients according to established treatment protocols?	Yes/No
	5	Are patients being educated about TB prevention?	Yes/No
	6	Is awareness of TB being raised in the community (i.e., are we conducting health education effectively)?	Yes/No
<b>Healthcare provider</b>	1	Are TB patients being screened appropriately for HIV (according to the TB diagnostic algorithm)?	Yes/No
	2	Are presumptive cases being referred appropriately for diagnostic testing?	Yes/No
	3	Are confirmed TB cases being treated according to established treatment protocols?	Yes/No
	4	Is treatment being accurately recorded using the recommended procedures and tools?	Yes/No
	5	Is TB preventative therapy (TPT) being appropriately prescribed in the facility?	Yes/No
	6	Are patients being educated about TB prevention?	Yes/No
	7	Is good infection control and prevention (ICP) being practiced in the facility?	Yes/No
	8	Are contacts of cases being traced effectively?	Yes/No
<b>Health facility/ clinic manager</b>	1	Are all TB cases being detected (based on the estimated prevalence)?	Yes/No
	2	Are patients being screened and diagnosed efficiently?	Yes/No
	3	Are staff levels sufficient to address needs for TB screening and diagnosis in the facility?	Yes/No
	4	Are quality control mechanisms in place for screening and diagnosis?	Yes/No
	5	Are the required supplies available for screening and diagnosis (tests, reagents, specimen containers, referral forms, etc.)?	Yes/No

User group	#	Data Need	Need met by TB information system?
	6	Are TB patients treated effectively and their outcomes monitored/recorded accurately?	Yes/No
	7	Are patients being adequately educated for TB prevention?	Yes/No
	8	Are sufficient supplies available for preventing infection at the facility (e.g., personal protective equipment [PPE])?	Yes/No
	9	Are the necessary (or government-required) tools available for data collection and reporting?	Yes/No
<b>Laboratory manager/ technician</b>	1	Does the laboratory have sufficient capacity (e.g., staffing, equipment, supplies, power, maintenance) to perform the expected number of tests based on estimated prevalence?	Yes/No
	2	Are the right tests available in the right quantities and in the right places (according to the country diagnostic algorithm)?	Yes/No
	3	Is testing efficient (turn-around-time) and up to standard (quality assurance), and always available when needed (no stockout of testing materials)?	Yes/No
	4	Is treatment effectively monitored to ensure the best treatment outcomes (e.g., re-test at 2 and 5 months)?	Yes/No
	5	Is the laboratory practicing good infection prevention and control (e.g., PPE)?	Yes/No
	6	Is there a laboratory referral network?	Yes/No
<b>District TB coordinator/ manager/ health officer</b>	1	Are all TB cases being found (based on estimated prevalence and within relevant population sub-groups)?	Yes/No
	2	Are the screening and diagnosis (e.g., coverage) targets being achieved?	Yes/No
	3	Is there sufficient capacity for TB screening and diagnosis (e.g., staff, finances, logistics, recording and reporting forms, Internet connectivity, etc.) for facilities in the district?	Yes/No
	4	Are TB treatment outcomes monitored adequately?	Yes/No
	5	Are TB treatment targets being achieved in the district?	Yes/No
	6	Is treatment of high quality in the district (e.g., DOTS coverage)?	Yes/No
	7	Are there sufficient supplies for treating the expected number of cases in the district (medications, diagnostics, etc.)?	Yes/No
	8	Is coverage for TB preventive therapy (TPT) adequate in the district (including among subpopulations)?	Yes/No
	9	Are sufficient supplies available for infection prevention and control in the district (e.g., PPE)?	Yes/No

User group	#	Data Need	Need met by TB information system?
<b>Regional TB coordinator/manager</b>	1	Are all TB cases in the region being detected (based on the estimated prevalence)?	Yes/No
	2	Are all TB cases in the region disaggregated by age, gender, TB condition (disease vs LTBI), TB site (pulmonary, extra-pulmonary), HIV status, drug susceptibility, etc.?	Yes/No
	3	Are TB treatment target(s) being achieved in the region?	Yes/No
	4	Is coverage of TB diagnostic services in the region adequate?	Yes/No
	5	Are sufficient resources for TB screening and diagnosis available in the region (e.g., staff, finances, logistics, diagnostics, medications, recording and reporting forms, Internet connectivity, etc.)?	Yes/No
	6	Is monitoring and supervision of diagnosis and treatment being conducted adequately in the region?	Yes/No
	7	Are TB treatment outcomes meeting targets for the region?	Yes/No
	8	Are sufficient resources available for treating the expected number of cases in the region (supplies, human and financial resources)?	Yes/No
	9	Are the resources required for TB prevention in the region available (supplies, human and financial resources)?	Yes/No
<b>Regional laboratory manager</b>	1	Is the quality of TB screening and diagnosis at facilities and districts in the region being adequately monitored?	Yes/No
	2	Do facilities and districts in the region have all the supplies they need for effective TB screening and diagnosis?	Yes/No
	3	Do facilities and districts in the region have adequate human and financial resources to conduct TB screening and diagnosis?	Yes/No
	4	Is adequate monitoring and oversight of TB screening and diagnosis being conducted in the region?	Yes/No
	5	Are TB laboratory services adequately supporting TB treatment in the region?	Yes/No
	6	Do the laboratories in the region have sufficient resources for TB prevention?	Yes/No
<b>NTP manager/policymaker</b>	1	Is the NSP and national guidelines for screening and diagnosis up to date?	Yes/No
	2	Is the TB diagnostic algorithm still appropriate for the country's need?	Yes/No
	3	Is coverage of TB diagnosis and treatment adequate in the country?	Yes/No
	4	Is the distribution of drug-resistant TB in the country adequately monitored?	Yes/No

User group	#	Data Need	Need met by TB information system?
	5	Is there sufficient laboratory capacity in the TB program?	Yes/No
	6	Is the quality of TB screening and diagnosis adequate?	Yes/No
	7	Are there sufficient resources for TB screening and diagnosis in the program (staff, finances, logistics, referral systems, and recording and reporting forms, Internet connectivity, etc.)?	Yes/No
	8	Is the TB treatment success rate in the country acceptable (i.e., meets the target)?	Yes/No
	9	Is the coverage of TB treatment services in the country adequate (i.e., meets the target)?	Yes/No
	10	Are sufficient supplies (drugs, other commodities) needed to treat TB patients in the country available?	Yes/No
	11	Is the coverage of TPT adequate nationally?	Yes/No
	12	Are there sufficient resources needed for TB prevention in the country (supplies, human and financial resources)?	Yes/No
	13	Are good infection control and prevention measures practiced in the country?	Yes/No
	14	Are there adequate funds dedicated to TB M&E?	Yes/No
	15	Is domestic funding for TB treatment and control adequate?	Yes/No
	16	Are there adequate governance structures for TB M&E (e.g., M&E technical working groups)?	Yes/No
	17	Is the program performance being appropriately monitored (e.g., review and oversight of completeness and timeliness of reporting from facilities)?	Yes/No
	18	Are there sufficient healthcare workers for the expected number of TB cases?	Yes/No
19	Is the performance of the healthcare workers assigned to TB high quality?	Yes/No	
<b>National M&amp;E director/manager</b>		Does the NTP conduct assessments to understand capacity and quality in the TB program? Please indicate whether the following assessments are conducted:	
	1	service availability and readiness (e.g., SARA)	Yes/No
	2	quality of care (e.g., QTSA)	Yes/No
	3	diagnostic system readiness (e.g., diagnostic network assessment)	Yes/No
	4	data quality (e.g., data quality review)	Yes/No
	5	progress towards targets (e.g., program review)	Yes/No

User group	#	Data Need	Need met by TB information system?
	6	Is the performance of the recording and reporting systems (e.g., paper-based, electronic, mixed) ever assessed?	Yes/No
		Do routine assessment and monitoring mechanisms exist for program performance in terms of:	
	7	progress towards targets?	Yes/No
	8	quality?	Yes/No
	9	coverage?	Yes/No
	10	equity?	Yes/No
	11	efficiency?	Yes/No
	12	Does program management include the practice of using routine data to inform and improve program implementation?	Yes/No
<b>National reference laboratory manager</b>	1	Is the laboratory section of the national guideline up to date?	Yes/No
	2	Is the national quality assurance guideline up to date?	Yes/No
	3	Do we have the right tests available in the right places?	Yes/No
	4	Do we have sufficient laboratory capacity (i.e., staffing, equipment, supply, power, maintenance)?	Yes/No
	5	Is the turn-around time for testing efficient and responsive to the needs?	Yes/No
	6	Do we have enough testing material (test kits, reagents, cartridges, slides, microscopes, media, etc.) in the labs?	Yes/No
	7	Is there a quality control mechanism in place (i.e., EQA or IQC)? Is it active (e.g., supervisory visits producing written reports)?	Yes/No
	8	If a quality control mechanism is in place (i.e., EQA or IQC), is it active (e.g., supervisory visits producing written reports)?	Yes/No/NA
		Does the TB information system provide information on:	
	9	TB diagnosis?	Yes/No
	10	presumptive RR-TB/MDR-TB?	Yes/No
	11	whether the patient received follow-up, and at what month?	Yes/No
12	microscopy results?	Yes/No	

User group	#	Data Need	Need met by TB information system?
	13	culture results?	Yes/No
	14	Xpert MTB/RIF results?	Yes/No
	15	drug susceptibility test (DST) results?	Yes/No
	16	line probe assay (LPA) results?	Yes/No
	17	HIV status?	Yes/No
	18	Is the NTP monitoring the performance of the diagnosis network?	Yes/No
<b>TB advocates, civil society, and media</b>	1	Is there improved awareness on TB so that people are able to recognize symptoms and seek timely healthcare?	Yes/No
	2	Is there advocacy for improved quality of service at health facilities, to improve capacity for diagnosis of TB?	Yes/No
	3	Is there improved awareness on TB so that people understand the need to take TB treatment exactly as it is prescribed by healthcare workers?	Yes/No
	4	Is there advocacy for improved quality of service at health facilities, to improve uninterrupted availability of TB medicines?	Yes/No
	5	Is there improved awareness on TB so that people understand how TB is transmitted from person to person, and take the necessary precaution to prevent it?	Yes/No
	6	Is there advocacy for improved quality of services at health facilities, to improve capacity for TB preventive therapy?	Yes/No



## Appendix F. D2AC Kyrgyz Republic Summary Findings (Group and Individual Responses Aggregation)

Table F1. Continuum score from aggregate responses, by domain

Domain number	Domain name	Average group score (N=5)	Average individual score (N=25)	D2AC level
D1	Data Collection and Reporting	3.38	3.24	Established
D2	Data Analysis and Use	2.77	2.51	Defined/Established
D3	Leadership, Governance, and Accountability	2.85	2.66	Defined/Nascent
D4	Capacity Building	3.25	2.64	Established
D5	Information and Communications Technology	3.25	2.87	Established/Defined
	<b>Overall</b>	<b>3.06</b>	<b>2.76</b>	<b>Established/Defined</b>

Table F2. Continuum score from aggregate responses, by subdomain

Subdomain number	Subdomain name	Average group score (N=5)	Average individual score (N=25)	D2AC level
D1S1	Data collection tools and workflow	3.73	3.40	Established
D1S2	Reporting	3.80	3.37	Established
D1S3	Data quality	1.70	2.58	Nascent/Defined
D2S1	Data integration and exchange	3.21	2.66	Established/Defined
D2S2	Analytics and visualization	2.25	2.22	Defined
D2S3	Dissemination and communication	2.90	2.81	Defined
D3S1	Data use guidance	1.18	2.48	Nascent/Defined
D3S2	Data access and sharing	2.40	2.45	Defined

Subdomain number	Subdomain name	Average group score (N=5)	Average individual score (N=25)	D2AC level
D3S3	Organizational structure and function	2.60	2.39	Defined
D3S4	Leadership and coordination	3.00	2.37	Established/Defined
D3S5	Monitoring, evaluation, and learning	3.40	3.07	Established
D3S6	Financial resources	2.80	2.46	Defined
D4S1	Data interpretation	3.07	2.38	Established/Defined
D4S2	Skill and knowledge development	3.11	2.04	Established/Defined
D4S3	Decision making ability	3.57*	3.57	Established
D5S1	Hardware	3.50	2.76	Established/Defined
D5S2	Network and connectivity	3.20	3.39	Established
D5S3	ICT business infrastructure	2.80	2.56	Defined

\* The average group score was not considered for this subdomain, where the questions pertain to personal and subjective opinions on job satisfaction, mentorship, training, and incentives/motivation. Instead, the aggregate score from individual responses was used.

## Appendix G. D2AC Toolkit Kyrgyz Republic Implementation Plan

Domain and subdomain	Priority action	Specific gap addressed	Responsible party	Resources needed	Expected deliverable	Timeline
<b>Domain 1, subdomain 3: Data quality</b>	Ensure that the electronic format for data collection and record-keeping and reporting forms is fully compliant	Test and form the terms of reference for changes and additions	Monitoring Division	Physical Human Financial	The electronic format will fully meet all necessary needs	6 months
	Refine the electronic database	Pharmacy information system	The project			
	Train oblast coordinators to verify data obtained from the district level	Training in data verification skills	NCPH Monitoring Unit			
	Train district TB specialists in completing the reporting forms	Training on how to fill in FRAs for verification of received data with electronic forms		Physical Human	Improving data quality	On a regular basis
	Define clearly developed instructions for the timely completion of accounting forms into electronic forms	Regular monitoring of the timeliness of completion of the form	Regional monitoring units and NCPH			
	Develop standardized data quality checklists for different levels, including the facility level	Revision of the M&E Manual	NCPH, Project	Physical Human Financial	Improving data quality	1 year
	Train district TB doctors in a regular and timely manner on definitions, clinical features and symptoms, treatment monitoring, elimination of NTDs, and prevention	Training on a regular basis and monitoring	NCPH, oblast coordinators, Kyrgyz State Medical Institute of Retraining and Professional Development (KGMIPiPK)			
	Ensure regular linkage of inter-agency databases containing TB data	Scattered information on TB	eHealth Center under the MOH of			

Domain and subdomain	Priority action	Specific gap addressed	Responsible party	Resources needed	Expected deliverable	Timeline
			the Kyrgyz Republic			
	Clearly define and document data quality parameters	Document data quality indicators (accuracy, completeness, timeliness, consistency, reliability, and integrity of data)	NCPH, partners	Necessary: Training of NCPH personnel responsible for data collection Technical support in writing manuals and SOPs that will ensure data quality Tools for measuring quality indicators	Data quality section will be included in the M&E manual	During the year
	Apply a standard data quality tool	Introduction into standard practice of a standard quality tool		Training of key persons Technical support in the implementation of the tool Cascade trainings	A tool has been implemented to enable control, monitoring and analysis of data quality.	On a regular basis
	Conduct an incident analysis and share feedback with data providers	Minimization of human factors affecting quality parameters	NCPH	Development of, training on, and implementation of feedback forms	Provided continuous feedback to data providers, incidents are analyzed and corrective actions are taken	During the year.
	Improve the data entry system	The data entry system prevents errors or automatically corrects them, so the quality will be higher.	NCPH, partners	Improvement of the electronic database	Data entry system eliminates errors	During the year
<b>Domain 2, subdomain 2: Analytics and visualization</b>	Develop an analytics and visualization manual in order to document and optimize the setting up of information dashboards and visualization of summary information based on statistical data	Dashboard method developed	NCPH, TB DIAH project	Consultants, funds	Dashboards developed for priority indicators	2022–2023

Domain and subdomain	Priority action	Specific gap addressed	Responsible party	Resources needed	Expected deliverable	Timeline
	from an electronic platform					
	Develop the guidelines on data analysis and interpretation for different areas of the TB service and for all levels (wide discussion among all stakeholders is needed)	Manual developed	NCPH, stakeholders and partner organizations	Working group, funds	Guidelines developed and approved	2022
	Develop terms of reference for system developers based on the adaptation of the two above-mentioned guidelines	Terms of reference developed		Funds	Developers have a shared vision and clear understanding of requirements and expectations	2022
	Strengthening the capacity of involved professionals (health workers, managers, partners, etc.) on data analysis issues (biostatistics issues, interpretation, etc.) to support NCPH decision making	Potential is strengthened	NCPH, partner organizations		Strengthened capacity facilitates effective implementation of NCPH and timely adjustments to interventions as needed	2022–2024
	Improve the practical knowledge and technical skills in the use of automated tools, including the electronic platform			Consultants, funds	Involved professionals are knowledgeable in analyzing and interpreting TB data	
	Encourage NCPH staff to conduct in-depth analysis (e.g., cascade analysis) and develop visualization primarily at the national level				NCPH staff routinely use analytics to make decisions	2023–2026

Domain and subdomain	Priority action	Specific gap addressed	Responsible party	Resources needed	Expected deliverable	Timeline
<b>Domain 3, subdomain 5: Monitoring, evaluation, and learning</b>	Update the M&E manual	Outdated M&E manual	NCPH (working group to write plan)	Discussion and writing platform, working group of competent people (analysts, statisticians, partners), work schedule, working group funding	Approved manual with full information and tools for M&E	Q4 2022
	Revise and develop an M&E plan to reflect new recommendations	National M&E plan outdated			New plan product release	
	File for necessary funding to implement M&E activities	Budget shortfall to implement M&E through state funding	Mandatory health insurance fund NCPH	Heads of organizations, financiers with M&E team	Filing estimates for plan implementation	End of 2022
	Include M&E curriculum development costs in estimate	No budget line item for M&E training	Oblast TB center Primary health centers	Funding for TWG work, working group and teaching staff	Allocated budget	2023
	Include an M&E curriculum for students at the Kyrgyz State Medical Institute of Retraining and Professional Development (KGMIPiPK)	Absence of M&E topics in the calendar-thematic plan of KGMIPiPK	MOH, NCPH, KGMIPiPK	Working group and teaching staff	Curriculum included	January 2023
	Revise staff schedule for national and regional monitoring divisions	Staff schedule of the national and regional monitoring divisions incomplete	MOH, Head of organization	Order on regulation of monitoring divisions	Approved plan for division	3rd quarter of 2022
	Organize training on the interpretation of received data (tools for analysis checklists, indicators of resources, processes, results)	Inability to analyze received data	NCPH, KGMIPiPK, partners	Training plan, program, trainers for training (maybe international level), developed checklists with M&E indicators	Trained qualified personnel, analytics, use of M&E tools	4th quarter 2022
	Conduct training on management, effective planning, and use of funds	Weak management (inability to make decisions to eliminate	MOH, NCPH	Financial resources, assistance of partners in providing	Trained staff in basics of organization management and management	2023

Domain and subdomain	Priority action	Specific gap addressed	Responsible party	Resources needed	Expected deliverable	Timeline
		problems, to adjust activities based on available budget and capacity)		training material and trainers		
	Develop a plan of intersectoral meetings with a program of M&E activities	No review of M&E implementation at the national and oblast levels at the intersectoral level	Local self-government bodies, MOH, NCPH, oblast TB center	Costs of meetings	Regular review of MEL processes as part of NCPH performance review	Twice per year
<b>Domain 4, subdomain 2: Skill and knowledge development</b>	Create a training program for data management and analysis	There will be trained employees with sufficient knowledge (computer literacy, ability to use the applicable information systems, analysis, skills of statistical data processing	KGMIPiPK, NCPH	Employees responsible for creating the program; State funding; Technical support;	Availability of this training program	Second quarter of 2023
	Monitor and evaluate primary specialty programs for effectiveness and relevance	Tracking that training programs are relevant and responsive to current NCPH needs and data collection and management tools in use	NCPH, KGMIPiPK	Human resources	A quality program that is constantly updated	On a regular basis
	Ensure that the NCPH offers opportunities and incentives for potential personnel to pursue primary specializations	On-the-job training, at the expense of the organization, career development	Human Resources	Finances (tuition fees, preservation of wages), career growth	Literate professionals/improving data quality and using data to meet NCPH goals	
	Organize trainings and seminars related to data collection and management	Sharing knowledge, data management skills.	NCPH, donors	State budget, donors, specialists, technical support		Regularly

Domain and subdomain	Priority action	Specific gap addressed	Responsible party	Resources needed	Expected deliverable	Timeline
<b>Domain 5, subdomain 3: ICT business infrastructure</b>	Develop normative legal documents, SOPs, and ICT guidelines	Financing Equipment Specialist Maintenance	Heads of organizations, MOH	State funding	Sustainable operation of all systems 2023	2023
	Develop a training plan at the level of the Kyrgyz State Medical Academy (KGMA), KGMIPiPK, and other medical schools and institutions	Lack of sufficient skills	MOH, KGMIPiPK, and NCPH	Teachers of high qualification	Raising the level of knowledge of medical institutions staff	2 years and constantly
	Provide technical support for ICT business infrastructure	Uninterrupted work of all ICT	Heads of organizations, MOH	IT staff in medical facilities to support informational systems and equipment	Satisfaction of users	2023





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