# A RAPID REVIEW OF THE USE OF TELEMEDICINE IN THE HEALTH SECTOR IN KYRGYZSTAN

From the People of Japan

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This publication was prepared by Neha Verma, PhD in Health Informatics, Johns Hopkins University with technical and financial support from the United Nations Children's Fund (UNICEF) within the project «Strengthening maternal and child health care system», funded by the Government of Japan.

The author is grateful to the representatives of the working group of the Ministry of Health of the Kyrgyz Republic, including the eHealth Center and representatives of medical organizations, development partners, and UNICEF for their support in collecting and analyzing the material.

This report is to provide information and suggestions for standardization of telemedicine services. It does not express an opinion as to the accuracy or completeness of the information provided by the author(s), the assumptions made by the parties that provided the information or any conclusions reached by those parties. This report is based on the information received or obtained, on the basis that such information is accurate and, where it is represented to the author(s) as such, complete. The information contained in this report has not been subject to an audit. All parties using this report should not consider the content as an alternative to legal or financial advice.

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# CONTENTS

# ACRONYMS

| | |
|---|---|
| **AIDS** | Acquired Immunodeficiency Syndrome |
| **CDAC** | Center for Development of Advanced Computing |
| **CIF** | Case Investigation Form |
| **CIS** | Commonwealth of Independent States |
| **EHC** | Electronic Health Card |
| **FAP** | Feldsher Obstetric Point |
| **FGP** | Family Group Practice |
| **FMC** | Family Medicine Center |
| **GPC** | General Practice Center |
| **HIV** | Human Immunodeficiency Virus |
| **ICT** | Information and Communication Technology |
| **KSMIRCT** | Kyrgyz State Medical Institute for Retraining and Continuous Training |
| **LAN** | Local Area Network |
| **MHIF** | Mandatory Health Insurance Fund |
| **MICS** | Multiple Indicator Cluster Survey |
| **MOH** | Ministry of Health |
| **NCD** | Non-Communicable Disease |
| **NGO** | Non-governmental organization |
| **PHC** | Primary health care |
| **RCHP** | Republican Center for Health Promotion |
| **RPM** | Remote Patient Monitoring |
| **SGBP** | State Guaranteed Benefits Package |
| **SOP** | Standard Operating Procedure |
| **TH** | Territorial Hospital |
| **UNICEF** | The United Nations Children's Fund |
| **WHO** | The World Health Organization |
| **XUAR** | Xinjiang Uygur Autonomous Region |

# 1. BACKGROUND

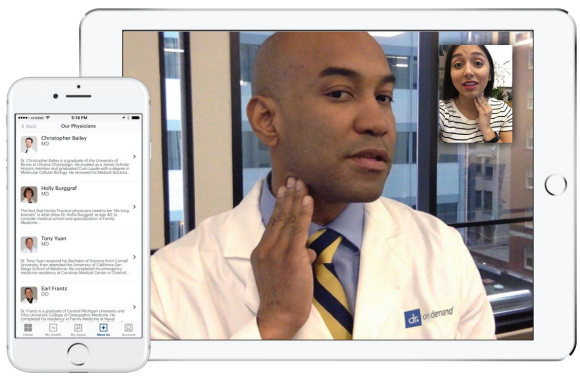
Digital health is the use of information and communication technologies (ICT) like internet, computers, mobile devices, sensors, connected medical devices, and wearables in health care service delivery. Digital health has several applications in health systems strengthening, prompting the World Health Organization (WHO) to release a guideline– "Recommendations on digital interventions for health system strengthening" in 2019. The guideline contains ten evidence-based applications of digital health. These are as follows:

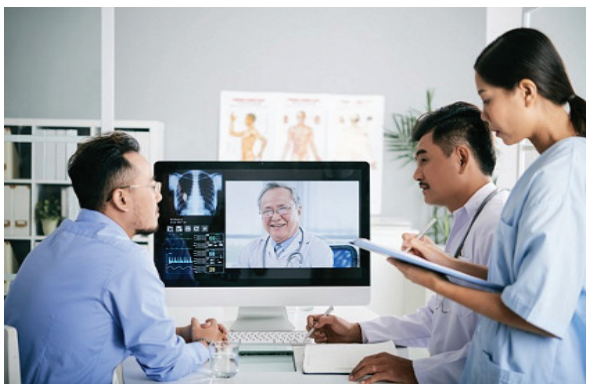
## 1.1. Definitions and applications of telemedicine

**Telemedicine:** This refers to the use of information and communication technology to deliver health services at a distance.

**Telehealth:** A somewhat broader term used to describe the use of technology not just for health service delivery but also for training and education of patients and health providers and its use in health administration.

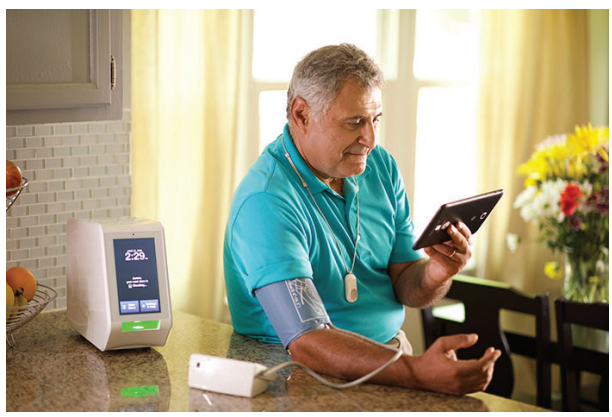
**Client-to-provider telemedicine:**
Client-to-provider telemedicine facilitates the provision of health services at a distance and is primarily used to link patients directly with health providers via mobile devices, also commonly referred to as "virtual visits" or "direct-to-patient telemedicine".





**Provider-to-provider telemedicine:**
Provider-to-provider telemedicine facilitates the provision of health services at a distance and is primarily used to link less skilled health workers with more specialist ones.

**Remote patient monitoring:**
Remote patient monitoring (RPM) uses digital technologies to collect health data from individuals in one location and electronically transmit that information securely to health care providers in a different location for assessment and recommendations. This type of service allows a provider to continue to track healthcare data for a patient once released to home or a care facility, reducing readmission rates.



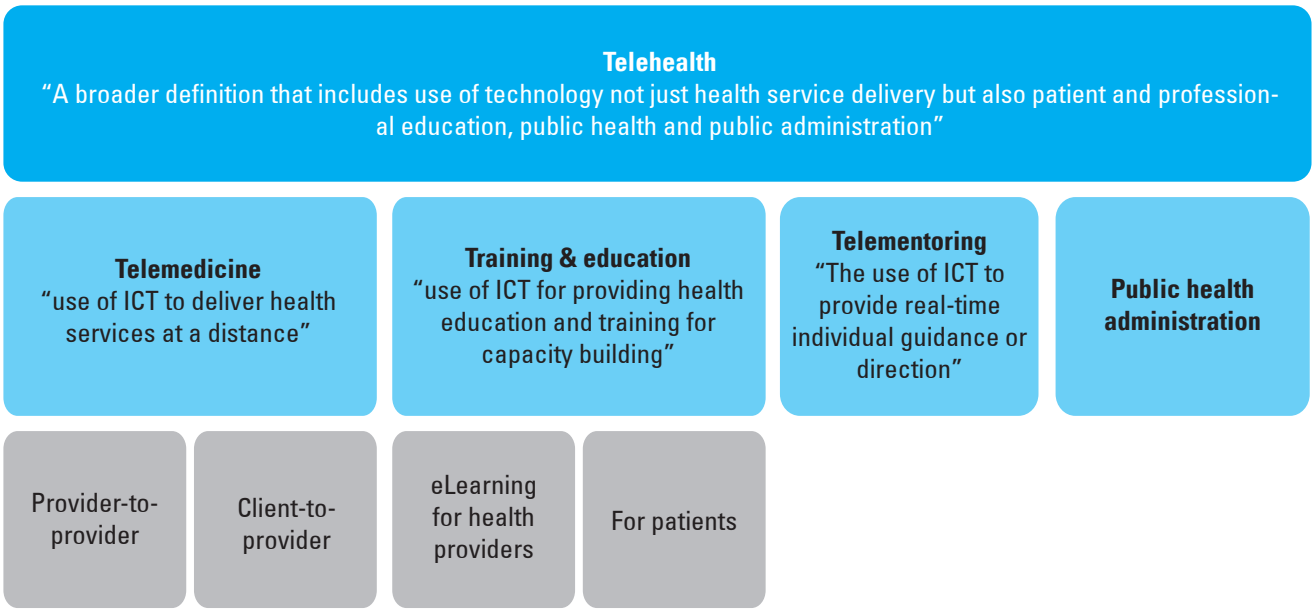
**eLearning:**
Facilitating medical education of healthcare providers through the use of information and communication technologies such as webinars, online courses, live surgery broadcasts, etc.

**Telementoring:**
Procedural guidance of one professional by another from a distance using telecommunications. A remote health provider of a higher skill level guides the on-site provider in real time through audio or video connections, typically through a surgery or a complicated medical procedure.

**Telesurgery:**
Different from surgical telementoring, telesurgery is an application area of telemedicine where a remote provider actually performs the surgery using a surgical robot.

**Synchronous telemedicine:** Real-time consultations involving audio or video calls between patients and providers or between different types of providers.

**Asynchronous telemedicine:** Transmission of medical files, such as images for review, also commonly referred to as "store and forward".




According to the WHO digital health guideline *"Recommendations on digital interventions for health system strengthening"* (WHO, 2019), client-to-provider telemedicine and provider-to-provider telemedicine can be used when accessibility to health facilities is poor (facilities are far or difficult to reach) and when the availability of human resources at those facilities to provide the desired level of care is low. See Annex 1 for a summary of the WHO guideline.

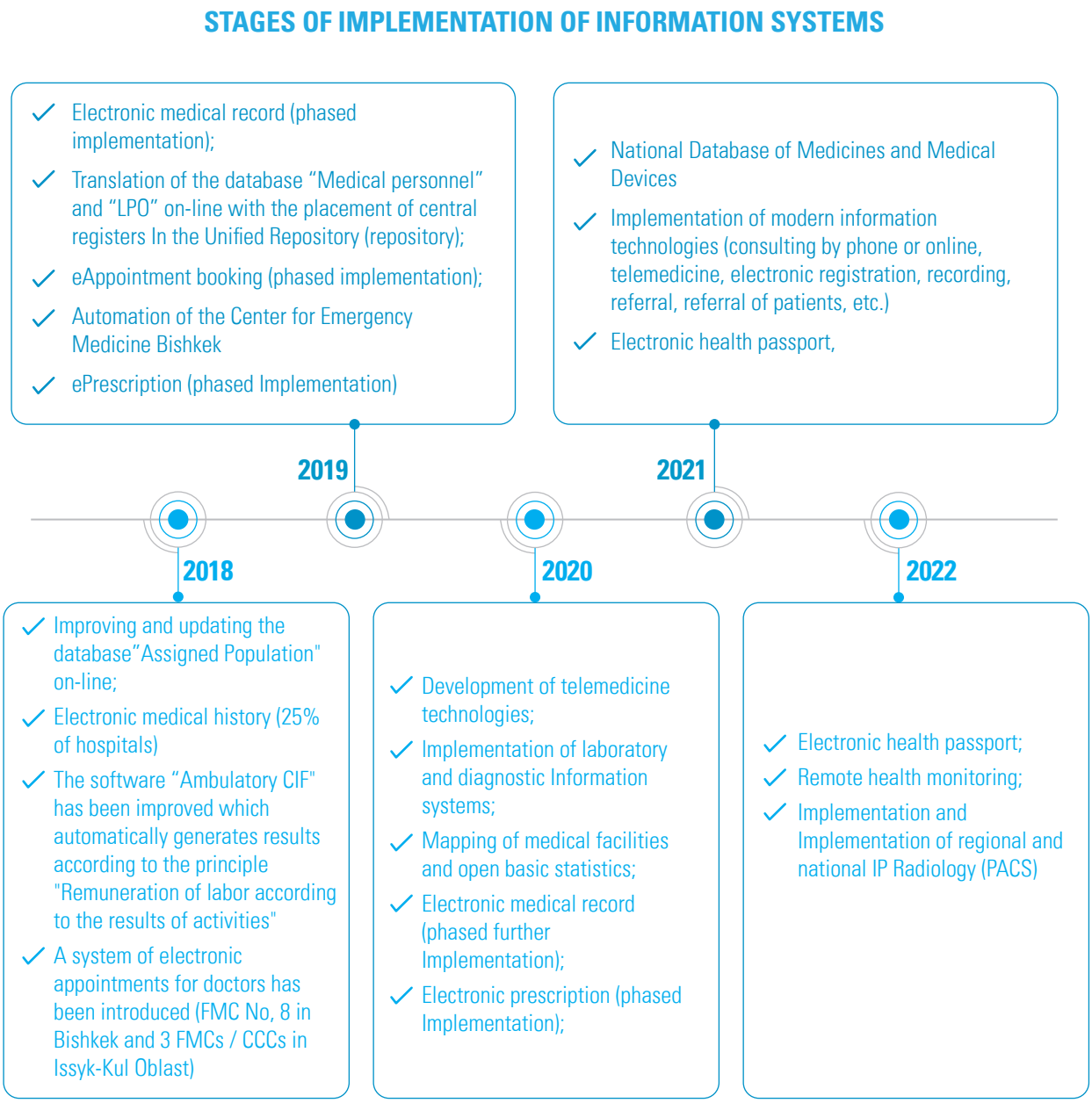
Key benefits of telemedicine include:

- Increases accessibility of health services for patients living in remote areas where the availability of health providers is poor. It reduces the distance travelled, time and money spent by patients in traveling to the nearest town or city to consult with a medical provider.
- Promotes health seeking behavior of patients, due to lower costs and effort to access care.
- Helps overcome health workforce staffing gaps in places where there are shortages of medical providers..
- Promotes effective management of patients with chronic diseases (hypertension, coronary heart disease, children with developmental disabilities, mental health disorders) through enabling monitoring of the treatment process and adjusting the treatment plans of patients without the need for them to travel.
- Reduces isolation of providers at remote facilities by connecting them with higher level providers for continuous learning and development.
- Improves the capacity of providers at remote locations as they can get updated with the latest advancements in medicine.

## 1.2. Telemedicine in the context of the overall digital health strategy

Telemedicine must fit into the larger context of the digital health strategy and implementation plan of the country. The availability of supporting infrastructure and digital health systems is important for ensuring that telemedicine fits smoothly into the digital health ecosystem. The timeline below (Figure 2) shows how telemedicine fits into the overall digital health roadmap of the Kyrgyzstan.

**Figure 2.** Digital health roadmap of Kyrgyzstan. Courtesy of Bahktiyar Stanbekov, Director of eHealth Center, Kyrgyzstan

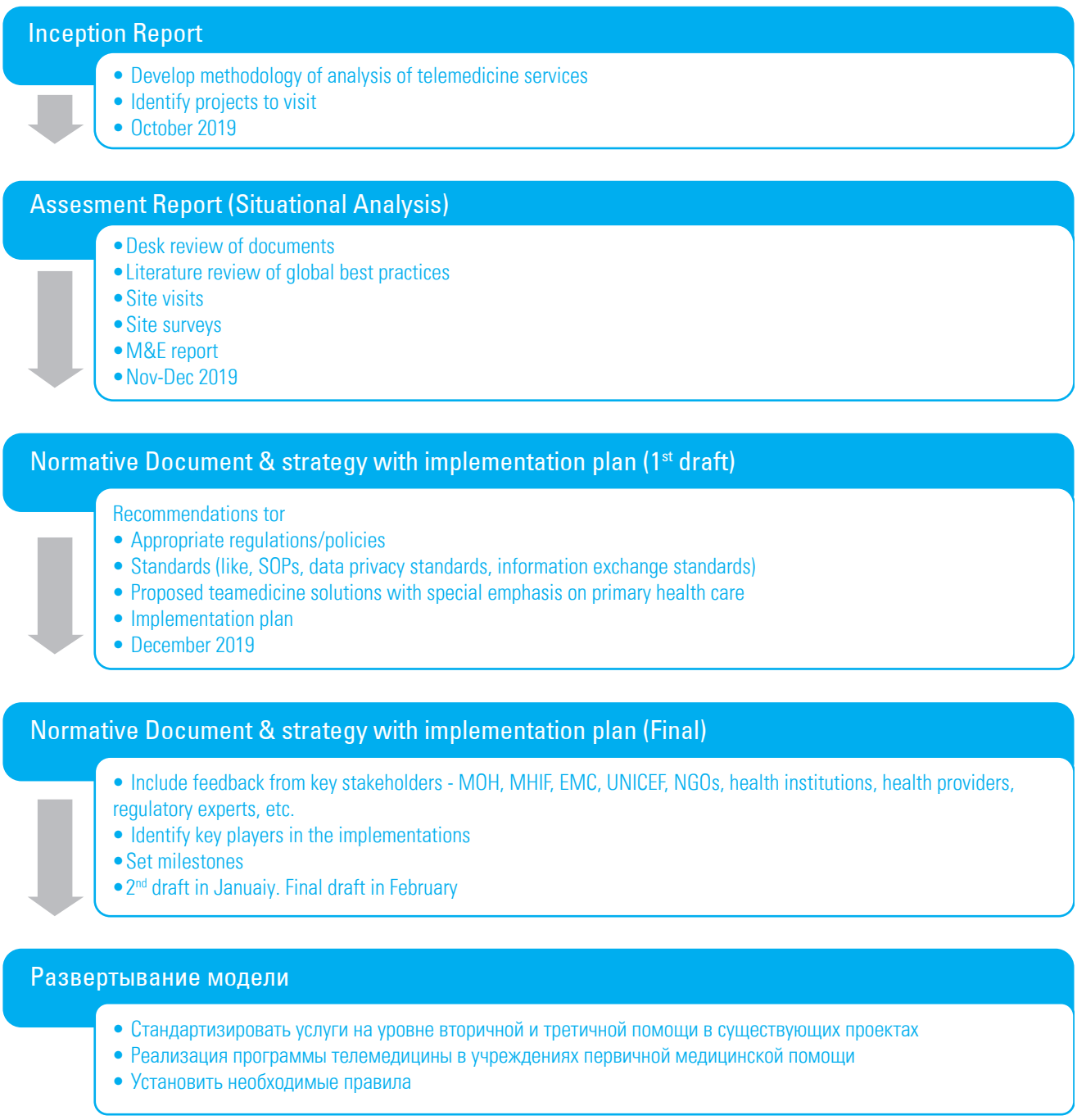


## 2. OBJECTIVES

This report presents the summary of a rapid review of the use of telemedicine services, projects, infrastructure, and norms in the Kyrgyzstan. It presents an analysis of the existing eHealth strategy in the context of telemedicine and telehealth as well as readiness assessments of the health system to support telemedicine and telehealth initiatives, including the contextual environment, health information system and challenges to service delivery. It also provides suggestions for going forward.

The findings from this rapid review will be used to inform a normative document and strategy with implementation plan for standardization of telemedicine services in the Kyrgyzstan.

**Figure 3.** Process for standardization of telemedicine services in the Kyrgyzstan.



# 3. METHODOLOGY

Methodology of this rapid review included:

- Review of 36 health facilities in Bishkek, Batken, Jalal-Abad, Issyk-Kul, Naryn, Osh, Talas, and Chuy oblasts conducted by eHealth Center (See Annex 1 for a list of facilities reviewed)
- Review of literature and health system documents
- A country visit with site visits to :
    - 6 tertiary care facilities in Bishkek, Osh, and Naryn with telehealth and telemedicine projects
    - 4 primary and secondary care facilities without telemedicine
- Key informant interviews with:
    - Stakeholders at 2 medical training institutions
    - 35 stakeholders, including Ministry of Health (MOH), eHealth Center, UNICEF, physicians, health facility managers, project managers, and funders. (see Inception Report for the semi-structured interview guide and Annex 2 for an interview list).
- Review of monitoring and evaluation documents shared by telemedicine project implementers
- Presentation and discussion of findings and recommendations with key stakeholders (Telemedicine Working Group)

The data collected during the health facility review, site visits, key informant interviews, and desk review of documents was organized into thematic areas. The key observations and challenges in each thematic area have been included in this report.

## Limitations

Due to the limited time and resources, site visits and interviews were only conducted at select sites, hence the findings may not be representative. This report may not include all the telehealth projects operating in Kyrgyzstan, however best efforts have been made to include all known telemedicine projects. The findings from this review must be interpreted keeping in mind that the sites selected for visits may not be adequately representative of the situation.

# 4. TELEMEDICINE AND TELEHEALTH PROJECTS IN THE KYRGYZSTAN

Several telemedicine and telehealth projects are ongoing in the Kyrgyzstan at a pilot level. Prominent among these projects are provider-to-provider telemedicine projects connecting doctors at oblast hospitals and Family Medicine Centers (FMCs) with national hospitals in Bishkek. Another major application area is in health provider education through eLearning.

**Policy and legal framework.** There are no clear laws related to telemedicine in Kyrgyzstan. The following guidelines provide some limited guidance:

1. "Agreement on cooperation of the State Parties of the CIS in creation of compatible national telemedicine systems and their further development and use" of 19 November 2010, Saint Petersburg, http://www.base.spinform.ru/show_doc.fwx?rgn=32672
2. Decree of the Ministry of Health of the Kyrgyzstan "On approval of the development strategy for postgraduate and continuous medical education in the Kyrgyzstan 2014 - 2020" of 18.05.2015. #248
3. The order of the Ministry of Health of the Kyrgyzstan "On approval of the Model Regulation on the Telemedicine Counseling System" of 06.10.2015. #574
4. E-health program of the Kyrgyzstan 2016 - 2020 (decree of the Ministry of Health of the Kyrgyz Republic of March 18.03.2016, # 134)
5. Decree of the Ministry of Health of the Kyrgyzstan "On approval of the architecture of the electronic system" Health Service of the Kyrgyzstan 2018- 2023." of 15.03.2018, # 190.
6. Program of the Government of the Kyrgyzstan on protection of public health and development of the health system for 2019-2030 «A healthy person- prosperous country». of 20.12 2018 # 600

A detailed policy analysis and recommendations are presented in a subsequent report on normative guidelines.

The table below summarizes the key application areas of telemedicine in Kyrgyzstan along with a list of known telemedicine and telehealth projects.

| | |
|---|---|
| **Types of telemedicine projects** | Provider-to-provider telemedicine; eLearning; Surgical telementoring; Informal peer groups between providers using Whatsapp |
| **Health application areas** | Specialist care, HIV, Family Medicine, Tertiary care, Emergency services |
| **User groups** | General physicians, Specialists, International specialists, Residents, Trainers |

| No | Name of project | Sites visited | Brief description of project | Current status |
|---|---|---|---|---|
| **Provider-to-provider telemedicine** | | | | |
| 1 | Telemedicine project between hospitals in India and the Kyrgyzstan | Osh Interregional Joint Clinical Hospital | Connects three national centers of Bishkek (National Mother and Child Health Center, National Center of Cardiology and Therapy, National Surgical Center) and three oblast centers (Osh Interregional Joint Clinical Hospital, Issyk-Kul and Talas Oblast Joint Hospitals) with each other, with other oblast | No consultations are currently going on between India and Kyrgyzstan. However, equipment is in use for other teleconferencing purposes |

| No | Name of project | Sites visited | Brief description of project | Current status |
|---|---|---|---|---|
| | | | health organizations and with Indian medical centers using eSanjeevani platform by Center for Development of Advanced Computing (CDAC), Mohali | |
| 2 | Telemedicine Project by Aga Khan Foundation | National Mother and Child Health Center, Naryn Oblast Joint Hospital | Connects the National Mother and Child Health Center in Bishkek with the Naryn Oblast Joint Hospital and Naryn Oblast FMC to improve the quality of medical services, enhance the capacity of medical workers and strengthen health service delivery, and prevent disease in communities. Implemented from 2015-2018, this project saw 361 teleconsultations conducted between Bishkek and Naryn. Specialities for which patients were seen include pediatrics, surgery, cardiology and family medicine. | Project was handed over by the Aga Khan Foundation to the health facilities to continue in 2018. However, since the handover, the volume of teleconsultations has decreased significantly. |
| 3 | Telemedicine project between the Ministry of Health of the Kyrgyzstan and the Municipality of Urumqi, Xinjiang Uygur Autonomous Region (XUAR) of People's Republic of China | National Hospital, Osh Interregional Joint Clinical Hospital, Osh Interregional Children's Clinical Hospital | Implemented in 15 organizations in the Kyrgyzstan to facilitate video conferencing between these organizations as well as with international organizations from other countries for training of physicians. The platform is also used to train primary care physicians. The platform is implemented at- (1) National Hospital; (2)Clinical Hospital of the general management department of the President and the Government of the Kyrgyzstan; (3) National Center of Oncology; (4) Republican Clinical Infectious Diseases Hospital; (5) Scientific Research Institute of Heart Surgery and Transplantation of Organs; (6) Chui Oblast Joint Hospital; (7) City Clinical Emergency Hospital for Children, Bishkek; (8) Zhaiyl United Territorial Hospital, Chui oblast; (9) At-Bashi Territorial Hospital, Naryn oblast; (10) Osh Interregional Children's Clinical Hospital; (11) Osh Interregional Joint Clinical Hospital; (12) Jalal-Abad Oblast Joint Hospital; (13) Batken Oblast Joint Hospital; (14) Maternity Hospital of Issyk-Kul Oblast Joint Hospital; (15) Kara-Buura Territorial Hospital, Talas Oblast. | Telemedicine equipment was installed at most of these facilities. The equipment is regularly in use at some facilities and used less regularly at others. The project has shown a benefit in receiving timely specialist consultations from republican hospitals for emergency patients reporting to oblast and district hospitals. |

| No | Name of project | Sites visited | Brief description of project | Current status |
|---|---|---|---|---|
| 4 | Telemedicine case discussions between experts at Geneva University and hospitals in Kyrgyzstan | National Hospital, At-Bashy Territorial Hospital | This project involves monthly case discussions between providers at hospitals in Bishkek, Naryn, Osh and other oblasts with specialists at the Geneva University. Providers in Kyrgyzstan who would like a specialist consultation from the Geneva University specialists submit their cases in advance. These cases are then translated by a medical person and sent to the Geneva University. From these, cases are selected for discussion every month. The discussion happens over a group video call and is facilitated by a translator who is also a physician in order to ensure clear communication. | Monthly case discussions are ongoing with the Geneva University. This project is funded by the Swiss Government, however long-term sustainability is a concern. |
| 5 | Telepsychiatry project | No sites visited. Project evaluation report was analyzed. | Connecting Republican Center for Health Promotion (RCHP) with Osh, Jalal-Abad and Batken Oblasts, Osh and Osh state University. This project involved connecting pilot FMCs with RCHP to provide specialist mental health consultations. Teleconsulting rooms were created at pilot FMCs and equipped with telemedicine technology. Patients with mental health disorders could participate in real-time consultations or providers at FMCs could reach out to specialists using a store-and-forward method by sharing the patient case on email and receiving recommendations in an asynchronous manner. This project was only partially implemented with sporadic teleconsultations. | The largest barriers to implementation were knowledge of availability of distance consultation options by patients, poor adoption by providers and incomplete availability of equipment at the FMCs. |
| **Telementoring** | | | | |
| 6 | Surgical telementoring project by the Aga Khan Foundation | Conference call with Aga Khan Development Network Digital Health Resource Centre | Specialized equipment was installed at facilities in Naryn including a high zoom camera which provides optical zoom and Virtual Reality capabilities. It is placed on the ceiling pointing towards the surgery table and allows viewing and zooming-in of the patient's region of interest. Video conferencing equipment, mounted on the wall, was installed allowing physicians in Bishkek and Naryn to interact with each other. Physicians in Naryn could broadcast surgeries | Project was handed over by the Aga Khan Foundation to the health facilities to continue in 2018. However, it is unclear if the equipment is in use for surgical telementoring. |

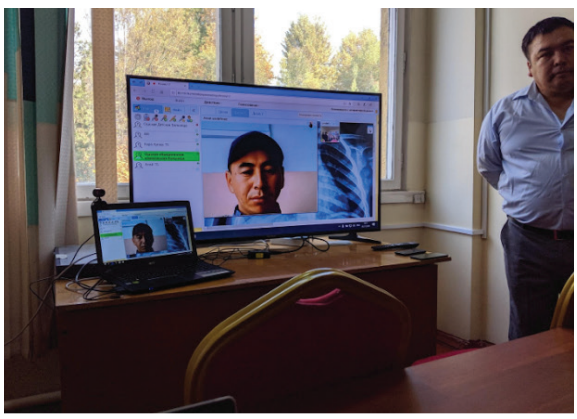
| No | Name of project | Sites visited | Brief description of project | Current status |
|---|---|---|---|---|
| | | | to experienced surgeons in National Surgery Centre, Bishkek to obtain second opinions. This provides assistance in diagnosing patients and allows consultations during surgical procedures in the operation theatre. | |
| **eLearning for Healthcare provider training** | | | | |
| 7 | eLearning- Swiss Education project | Conference call with Aga Khan Development Network Digital Health Resource Centre | Physicians at the National Surgery Centre in Bishkek could record surgical procedures and share with health care professionals at the Naryn Oblast Merged Hospital, as well as other hospitals, allowing eLearning activities to take place. 2015-2018, 1928 health professionals were trained and 251 eLearning sessions were offered. | Project was handed over by the Aga Khan Foundation to the health facilities to continue in 2018. However, it is unclear if the eLearning sessions are still continuing. |
| 8 | eLearning- SWISS Education project | At Bashy Territorial Hospital, Naryn Oblast Joint Hospital | This project uses eLearning to provide training to healthcare providers, with a focus on post-graduate training of medical residents in family medicine, using webinars and teleconferencing. Weekly trainings are provided for family medicine residents using technology tools like Moodle and Doodle. These webinars are followed by a competency assessment and adhere to a specific curriculum. | Regular eLearning sessions are ongoing. These have helped to increase capacity of family medicine residents. Attendance by other medical providers is also seen, though not high. |
| 9 | eLearning- iCap (Project ECHO format) by Kyrgyz State Medical Institute for Retraining and Continuous Training | Kyrgyz State Medical Institute for Retraining and Continuous Training | This project aims to improve capacity of providers to manage HIV/AIDS. The Project ECHO format involves weekly teleconferences where some example patient cases are chosen and discussed for upskilling providers. | Monthly case discussions occur on a regular basis and are well attended. |

**Capacity building initiatives:** In 2017, the People's Friendship University of Russia (a member of the "Russian Telemedicine Consortium") conducted a two-week course "Telemedicine systems, bases of informatization of public health services," in the Kyrgyz language which was attended by heads of five health facilities. The training course was aimed at "forming a holistic view of the directions, problems and principles of the use of modern information, communication and telemedicine technologies, complex and local information systems of public health institutions, «cloud» technologies in healthcare, personalized medicine, regulatory acts that regulate the informatization of health facilities, the economy of telemedicine and insurance system." All participants provided follow-up training in their respective health facilities.

*Teleconsultation room at National Maternal & Child Health Center. Equipment provided by Aga Khan Foundation*

*Teleconsultation room at Naryn Regional Hospital. Equipment provided by Aga Khan Foundation*

*Teleconsultation room at At Bashy Rayon Hospital. Equipment provided by Aga Khan Foundation (left) & People's Republic of China (right)*

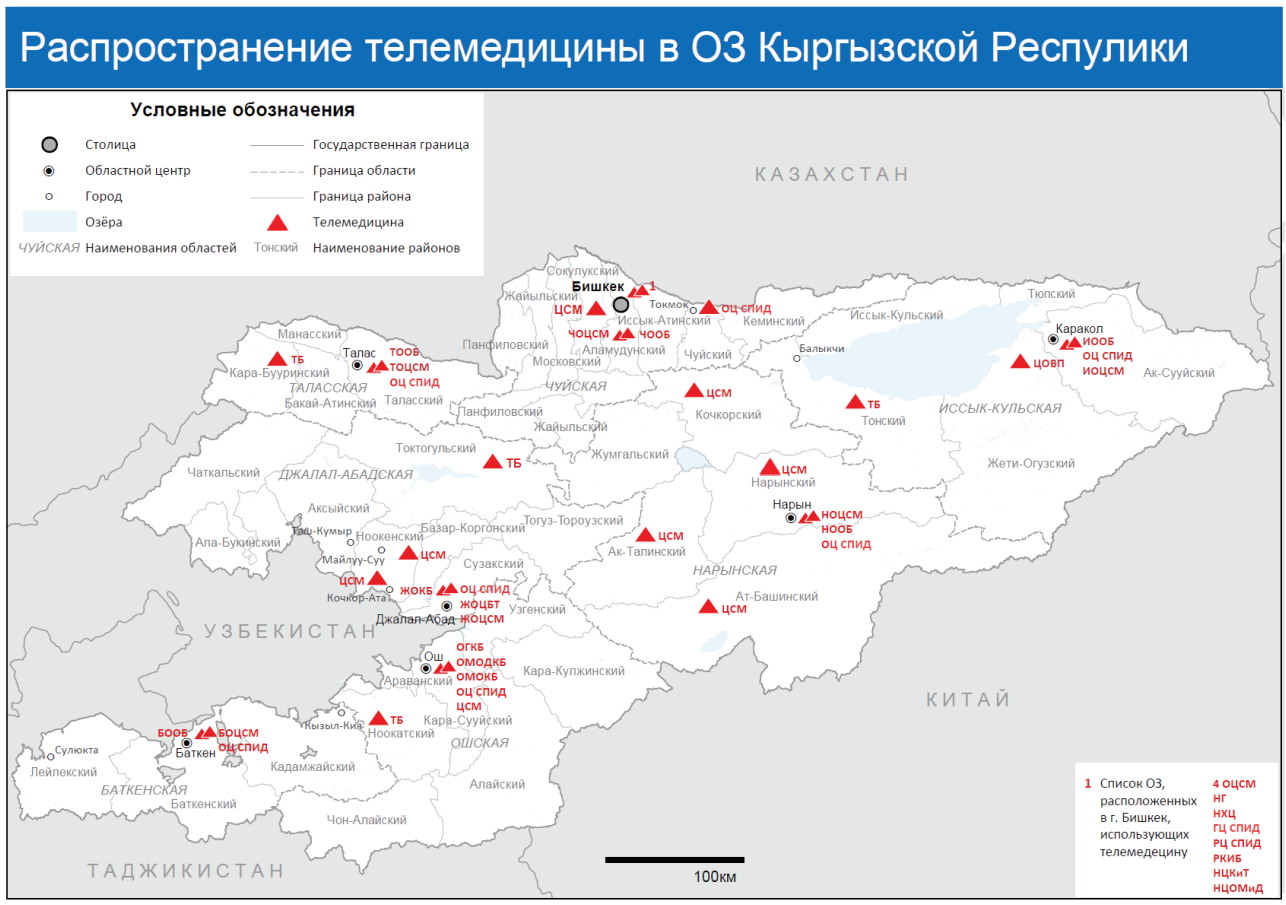



*Teleconsultation room at Osh Interregional Joint Clinical Hospital. Equipment provided by People's Republic of China (left) & Govt of India (right)*

## 4.1. Provider-to-provider telemedicine

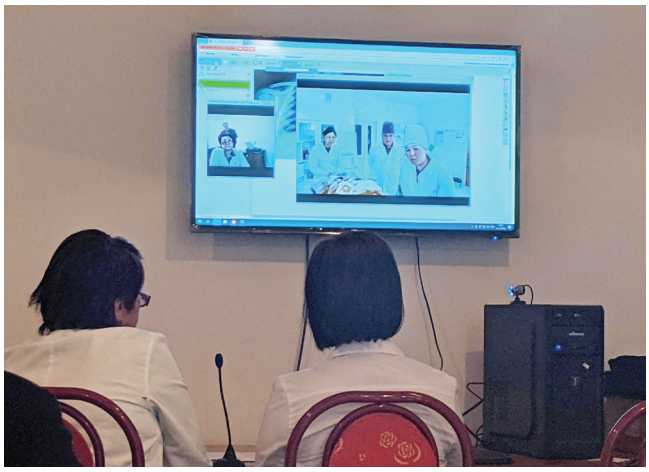
Provider-to-provider telemedicine projects are mainly at the tertiary and secondary level, where the focus is mainly on emergency care and specialty care. Of the 36 facilities that participated in the review (Figure 4), 21 reported performing teleconsultations with remote specialists. These were consultations with specialists both within the country or abroad(Switzerland, China, USA).

**Figure 4.** Health facilities with telemedicine services in the Kyrgyzstan




**Services and applications.** The largest use case and benefit for provider-to-provider telemedicine was in emergency care. Prior to the implementation of telemedicine, when a district or oblast hospital encountered an emergency case that was too complex to handle, they would place a call to the "Sanitary Aviation" (a type of medical retrieval service) department. An emergency response team of physicians would be dispatched by ambulance from the nearest tertiary hospital to the remote site to conduct the surgery. This adds an enormous cost burden to the system, while also adding a delay of 2-6 hours depending on how far the nearest referral unit is. Anecdotal evidence showed that physicians at the tertiary site reported that a majority of cases could have been managed remotely. For example, it was reported that in 2018, Osh Interregional Joint Clinical Hospital received ~1900 requests for specialist visits to remote facilities through sanitary aviation. Less than 30 cases actually needed specialists to be present, the rest could have been managed remotely.

Other application areas include specialist consultations for **pediatrics, surgery, cardiology and family medicine.** The project by Aga Khan Foundation reported 361 teleconsultations in 2015-2018 between Bishkek and Naryn. Regular provider-to-provider teleconsultations are also ongoing with international specialists. Pilot projects were implemented for **surgical telementoring** by the Aga Khan Foundation. A **telepsychiatry project** was implemented with limited success due to partial implementation. According to the results of a survey among patients, it was revealed that 10 respondents (4.8%) went to Bishkek to receive services for mental illness, half of which went from 2 to 5 times in the last two years. Also, patients noted that a trip to Bishkek and medical consultations require considerable financial costs, ranging from 1,500 to 38,000 som. Thus, it is possible to save a considerable amount of cost to the patient to access health services near them through telemedicine.



*A teleconsultation in progress between Osh Interregional Children's Hospital and Nookat Territorial Hospital to discuss the management of a child with pneumonia (Equipment provided by the People's Republic of China).*

*Surgery being performed at the hospital in Naryn with telementoring support from Bishkek. (Equipment provided by Aga Khan Foundation).*

**Utilization of services.** There was an inconsistent use of provider-to-provider telemedicine across facilities, with some facilities seeing 300-500 teleconsultations per year, and others just 3-5. The main reported reasons for this inconsistent use were unclear legal basis for telemedicine, physicians were concerned about responsibility and liability, unclear and inconsistent financing mechanisms, unclear referral guidelines, several projects working in silos without a coordinating body and changing funder priorities. At health facilities where the telemedicine services were in consistent use, the project was driven by an "internal champion".

**Provider adoption.** There appears to be a high acceptability among providers in the use of telemedicine. However, doctors are unclear about the legal basis for telemedicine and are unclear about who is responsible for patient outcomes - the site physician or remote physician. Physician time for providing a remote consultation is not reimbursed, hence this is a cost incurred by the facility. Providers may not be familiar with use of technology and may find it intimidating. Providers are not aware of referring guidelines (when to refer a patient for in-person care and when telemedicine is an appropriate standard of care). This may cause providers to not recommend telemedicine services to eligible patients. The reasons listed above contribute to an overall lack of provider adoption which is a large barrier to the utilization of telemedicine services.

**Training.** IT training is being provided at some facilities to support roll out of electronic medical records, but largely providers do not have the necessary technological skills. Facilities with telemedicine reported that providers were given training in the use of the equipment and technology. IT specialists were also available on hand to support the providers during the teleconsultations. Training in use of technology would be an essential component of any telemedicine intervention. No training is given to providers about referral guidelines or standard treatment guidelines in telemedicine-based consultations.

**Data sharing and record-keeping standards.** Projects shared data between the spoke and hub sites through various different modalities, including dedicated software applications, email, or screen-sharing. Record keeping in projects was poor, and the use of teleconsultation as a mode of getting guidance from remote providers about the patient's treatment plan was not included in the patient's case investigation form (CIF) reporting form or their medical record. There were no

clear guidelines for how patient data would be shared between the requesting physician and the remote consulting physician. The lack of clear data makes it difficult to draw conclusions about the effectiveness of an intervention on patient outcomes. Data sharing with foreign institutions were not governed by inter-institutional agreements. Patient consent for data sharing was considered implied in some settings, obtained verbally in some institutions and in writing in others.

**Patient awareness and empowerment.** In the majority of projects, patient consent was obtained verbally only, with only one facility documenting written consent. Consent procedures were unclear. Patient awareness of the availability of teleconsultation services was reported as a key problem by the telepsychiatry project. 95% of patients surveyed did not know about the option to receive distance counselling from specialists in Bishkek at the district FMC, resulting in a poor utilization of services. All patients receiving the service reported that this format was more convenient and expressed the desire to receive consultations in the future using telemedicine. Hence, patient awareness about the availability of telemedicine services should be an important component of telemedicine projects.

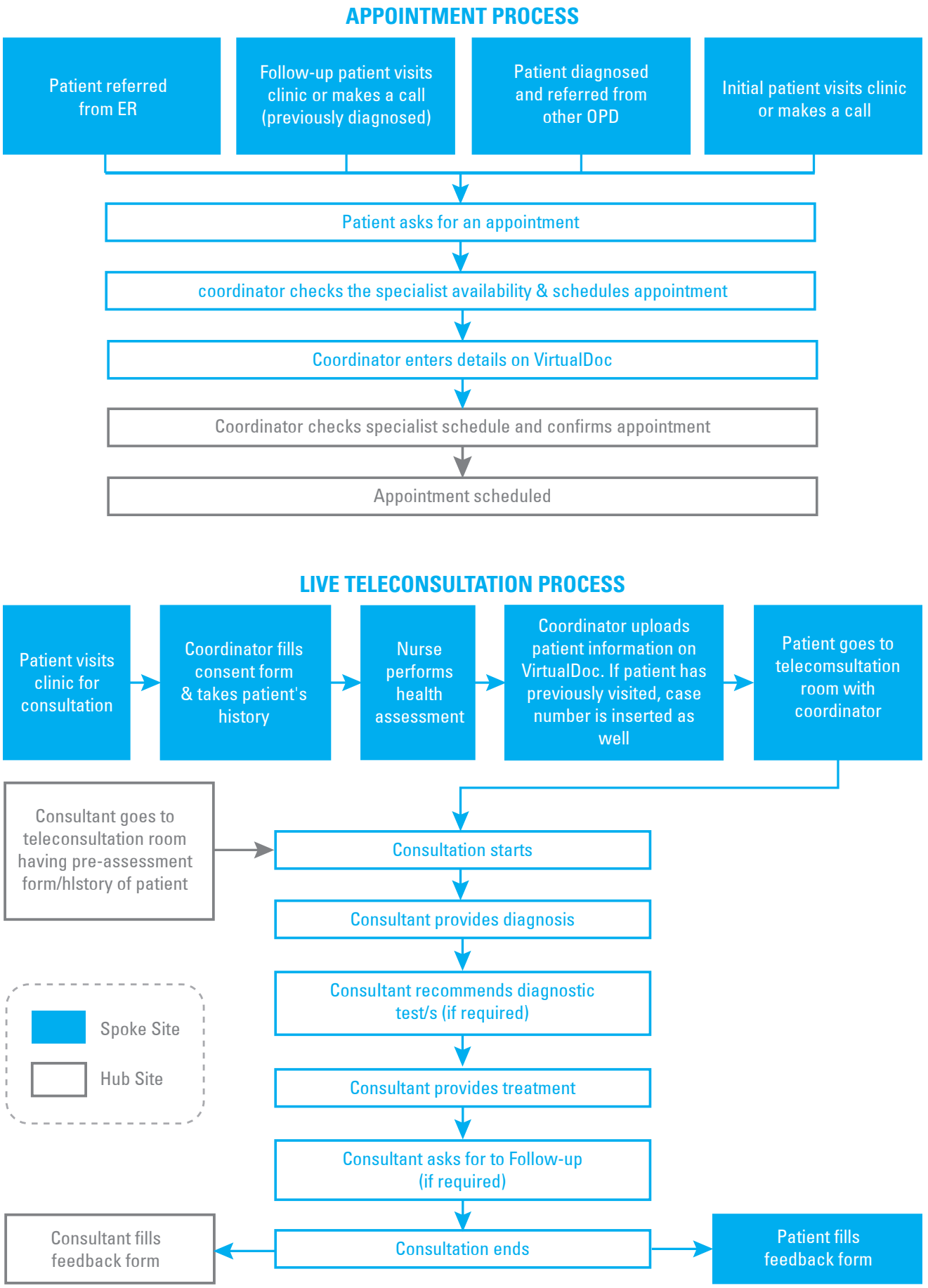
**Operating challenges.** Challenges in the project operations were reported across all projects. Some of these included challenges with appointment scheduling with specialists at the tertiary facility for non-emergent patients. Teleconsultation rooms have been set-up at several facilities, however, these rooms were observed to be set up away from the main clinical buildings. This may create a sense that the telemedicine project is not fully incorporated into the operations of the hospital. This requires providers to significantly deviate from their daily routines to go to the teleconsultation rooms. For patients with emergency conditions, providers reported that it was not possible to transport the patient to the teleconsultation room, hence some facilities had installed equipment on portable carts that could be wheeled inside the facility and could be brought to the patient's bedside.

The Figure 5 below shows an example of a standard operating procedure for live teleconsultations.

**Infrastructure & technology.** Teleconsultations are primarily done through web or computer applications. Facilities with telehealth projects have installed equipment for videoconferencing such as computers, laptops, webcams, monitors, microphones, speakers, and projectors. Only one facility reported the use of point of care diagnostic devices, such an electronic stethoscope and an otoscope to allow the remote provider to collect additional data about the patient. Some software applications used for video-conferencing and medical record sharing were VirtualDoc, eSanjeevani software application, Polycom, Zoom, and Skype. The use of mobile applications is informal, with providers using WhatsApp for case discussion. Mobile applications were reported to be more convenient to use by providers due to their portability and flexibility, allowing them to easily respond to cases during their workday.

There is availability of broadband internet at most tertiary and secondary care facilities, and some FMCs and FGPs; however, the internet bandwidth is inconsistent, and several facilities reported challenges in establishing video links due to poor internet. There is availability of mobile internet (4G) at FAPs and FGPs, however mobile internet is not used to provide telemedicine services. Roll out of an electronic health record systems is currently ongoing, providing supporting infrastructure. Technology infrastructure (Wi-Fi, LAN, laptops, desktops, monitors, printers, scanners, servers) are still being put in place. In some centers, there was an incomplete set of technology components installed, which makes those that are installed not useful. The cost of procurement of technology equipment was borne by the health organization from their own budget or from a donor organization. Project scale up would be affected by the budgetary implications. Informal use of mobile technologies was observed, where doctors would use informal WhatsApp groups for peer-to-peer communication to get

**Figure 5.** An example of a standard operating procedure for live teleconsultations



support on cases. It is also common for doctors to call one another directly and receive a second opinion or consult. Use of mobile technologies and mobile internet may help mitigate some of the cost issues and operational challenges associated with technology procurement and operations of telemedicine projects.

**Cross-border teleconsultations.** Cross-border telemedicine can help to improve the standard of medical expertise in the country by upskilling providers in the latest advancements in medical science. International teleconsultations with Geneva University were generally well attended and appreciated by providers. Some additional challenges were reported in the case of teleconsultations with these international specialists. Due to the large reliance of these programs on funders, there are concerns about sustainability. In addition, facilities reviewed cited language as a barrier to effective communication. Physicians also reported that at times specialists would provide care recommendations that did not conform with the in-country treatment guidelines.

Thus, several implementation challenges need to be addressed, chief among which are regulatory guidelines, operational guidelines and financing mechanisms.

## 4.2. Health provider education

Three projects were reviewed under this domain- Aga Khan eLearning project, Swiss Education project and ICAP. All of these provide training to healthcare providers using webinars and teleconferencing. The Swiss Education project aims to strengthen the quality of Family Medicine doctors through eLearning and distance education. The project conducts weekly webinars on specific topics for 2nd year Family Medicine residents to improve the quality of post graduate training. In addition, webinars are also conducted for physicians at remote facilities for continuing medical education. Post-session competency assessment is carried out in the form of quizzes. The iCAP project by the Kyrgyz State Medical Institute for Retraining and Continuous Training (KSMIRCT) post-graduate medical training institute follows the Project ECHO format to improve training and capacity of providers to manage HIV/AIDS. The Project ECHO format involves weekly teleconferences where some example patient cases are chosen and discussed. The trainer explains the case and the approach to manage the patient case followed by a discussion and training.

Kyrgyzstan already has some experience in implementing distance education, so the Ministry of Health, together with KSMIRCT , developed the Regulation "On the Center for Remote Clinical Mentoring in Continuing Professional Development (Education) of Kyrgyzstan Medical Workers", which contains sections describing scope, main tasks and functions of the Center; the structure of the Center, as well as the rights, duties and responsibilities of the Center. The Regulation "On the use of distance learning in the continuous professional development (education) of medical workers of the Kyrgyzstan" was also developed. The Decree of the Ministry of Health of the Kyrgyzstan "On Approval of the Development Strategy for Postgraduate and Continuous medical education in the Kyrgyzstan 2014 - 2020" of 18.05.2015. #248 provides a regulatory basis for conducting distance learning and education.

### 4.3. Client-to-provider telemedicine

Currently there is no known client-to-provider telemedicine project in the Kyrgyzstan. A direct to patient component was planned in the telepsychiatry project, but this was not implemented. In interviews with the Minister for Health and other MOH officials, a desire to implement direct-to-patient telemedicine services was observed as a way to reduce patient load at overburdened health facilities, improve patient convenience and satisfaction with the healthcare system. Based on data from the 2018 Multiple Indicator Cluster Survey (MICS), 99.2% of households in Kyrgyzstan had access to mobile phones, of which 79.2% had a smartphone. However, only 27.1% of households used a computer. 76% of urban and 65.3% of rural households had access to the internet from any one device from home. This level of diffusion of information and communication technologies in the population indicates that client-to-provider telemedicine programs would be accessible to the public, including to women as 73.7% of women surveyed had accessed the internet at least once a week in the last three months (see Annex 3). Such programs should use mobile technology in order to achieve widespread reach. Further analysis would be needed to determine the scope and application areas of client-to-provider telemedicine.

## 5. SUMMARY OF KEY CHALLENGES AND GAPS

This section summarizes the key challenges and gaps identified during the rapid review. It is vital that these are addressed in order to promote the implementation and scale up of telemedicine projects in the Kyrgyzstan. Table 1 below summarizes the key findings of a maturity assessment.

**Table 1.** Maturity assessment

| Foundational layer | Level of maturity | Comments |
|---|---|---|
| Strategy and Investment | Low | Strong focus on digitalization (Sanarip, eHealth Strategy). However, there are unclear financing mechanisms for telemedicine, as the MHIF does not provide reimbursement for telemedicine services, nor is it included in SGBP. |
| Services and Applications | Low | Telemedicine has been applied in some contexts, but its use is not fully mature. |
| Standards and Interoperability | Low | Some standards are defined in eHealth strategy, but not implemented yet. Records are still largely paper-based and systems do not interoperate with each other. |
| Infrastructure | Moderate | Internet connectivity (broadband or mobile) exists in most locations, however several facilities report that availability of internet may be inconsistent. Consistent availability of power is high. Telemedicine related equipment installed at a number of facilities at secondary and tertiary level. |
| Legislation, Policy and Compliance | Low | No clear laws related to telemedicine. The following provide some limited guidance:<br>1. E-health program of the Kyrgyzstan 2016- 2020 (decree of the Ministry of Health of the Kyrgyzstan of March 18, 16, #134)<br>2. On approval of the development strategy for postgraduate and continuous medical education in the Kyrgyzstan 2014- 2020" of 18.05.2015. #248 |

| | | |
|---|---|---|
| | | 3. The order of the Ministry of Health of the Kyrgyzstan "On approval of the model regulation on the telemedicine counseling system" of 06.10.2015. #574 |
| Workforce | Moderate | Electronic health card (EHC) established, IT specialists available at secondary and tertiary facilities. IT training provided to facility staff. No training provided to providers on the use of telemedicine. |

**Key challenges reported:**

- Doctors are unclear about the legal basis for telemedicine.
- Doctors are unclear who is responsible for patient outcomes – on-site physician or remote physician.
- Physician time for providing a remote consultation is not reimbursed, hence this is a cost incurred by the facility.
- Providers may not be familiar in use of technology and may find it intimidating.
- Providers are not aware of referring guidelines (when to refer a patient for in-person care and when telemedicine is an appropriate standard of care). This may cause providers to not recommend telemedicine services to eligible patients.
- No training is given to providers about telemedicine-based consultations.
- The reasons listed above contribute to an overall lack of provider adoption which is a large barrier to the utilization of telemedicine services.
- No standard operating procedures for patient record sharing- occurs verbally, over email, WhatsApp, telemedicine software or screenshare.
- Remote physicians' recommendations not recorded on the patient-chart.
- In case of international consultations, remote physicians from other countries may provide recommendations that are different from in-country clinical protocols.
- Patient privacy and confidentiality as well as data security concerns due to lack of sufficient regulatory framework.
- No reimbursement mechanism under Mandatory Health Insurance Fund (MHIF), unclear about co-pays. It is unclear whether this would be included under State Guaranteed Benefits Package (SGBP) when used for vulnerable communities, primary care and maternal and child health.
- Inconsistent use of telemedicine services across facilities.
- Declining use due to lack of sustained funding- donor dependent.
- Purchase of infrastructure and its maintenance is dependent on donors or on hospital budgets.
- Insufficient availability of equipment and infrastructure at the facilities.
- Portability and convenience. More convenient to use WhatsApp or mobile technologies for provider-to-provider communication.
- Unclear follow up, monitoring and evaluation mechanisms.
- No central body coordinating telemedicine activities. Results in siloed projects and duplication of donor resources.
- No financing for procurement and repair of equipment increase the reliance on donors or facilities funds.
- No credit hours are provided to doctors when attending educational webinars, resulting in lower participation in eLearning activities.

## 6. NEXT STEPS

In order to standardize the telemedicine services provided in the country, the recommended next steps would include:

- **Formation of a telemedicine working group**
- **Development of normative guidelines**
  - Ensure a strong foundation for implementation of telemedicine services
  - Normative guidelines should cover the current scope of telemedicine services in Kyrgyzstan as well as potential future applications
  - Normative guidelines should include:
    - Regulatory guidance recommendations for a law for provider-to-provider as well as client-to-provider telemedicine
    - Comparative policy analysis of existing laws in countries like Russia, India
    - Cover guidance for in-country as well as international teleconsultations
    - Standard operating procedures and business process standards
    - Training and certification standards
    - Data and information exchange standards (HL7, FHIR, DICOM)
    - Data privacy and security standards
    - Technology standards (minimum specifications for mobile and desktop devices, software standards)
- **Develop an implementation strategy to standardize current projects**
  - Identification of a central body responsible for implementation of telemedicine (e.g. eHealth Center)
  - Implementation plan for normative standards in current republic, oblast, and district hospitals and FMCs where teleconsultations are currently taking place for emergency services and specialty care
  - Implementation plan for monitoring & evaluation to track impact of telemedicine on patient outcomes and health system efficiency
  - Identify basis for sustainable financing through reimbursement and MOH funds
- **As a pilot, develop an implementation strategy for telemedicine to strengthen maternal and child health services at PHC level**
  - Identify key primary health care (PHC) health priorities- maternal and child health, non-communicable diseases (NCDs), etc.
  - Develop a project design that will be implemented at FAPs, FGPs and FMCs
  - Identify appropriate technology solutions that are low-cost, sustainable and scalable (recommend mobile technology approach)
  - Develop an implementation plan in a model district
  - Define a monitoring and evaluation framework to measure impact on key indicators.

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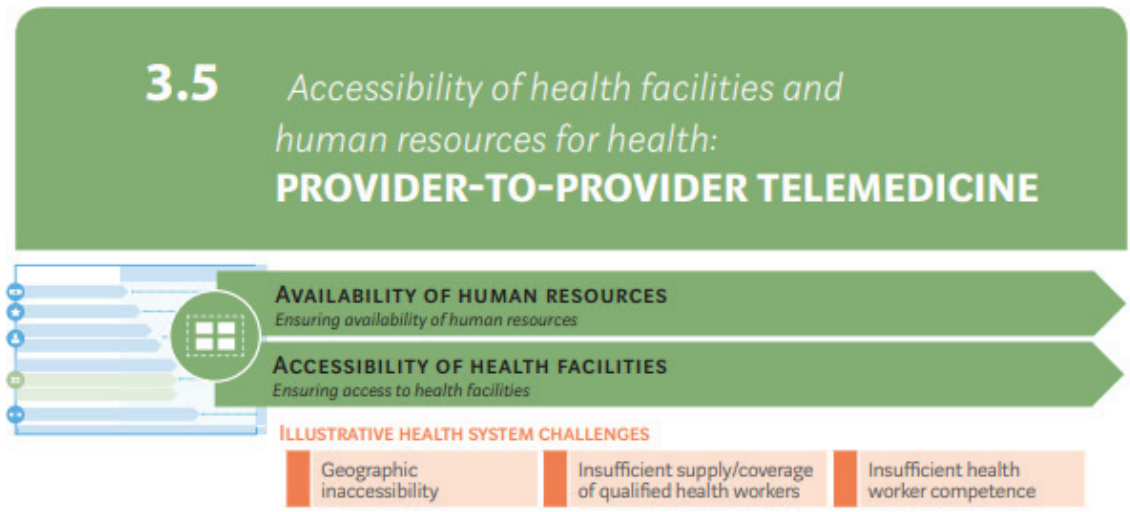
# ANNEXES

## Annex 1: Summary of WHO recommendations on digital interventions for health system strengthening




**PROVIDER-TO-PROVIDER TELEMEDICINE**
*(Recommended only in specific contexts or conditions)*

RECOMMENDATION 5

**WHO recommends provider-to-provider telemedicine in settings where patient safety, privacy, traceability, accountability and security can be monitored.**

In this context, monitoring includes the establishment of standard operating procedures that describe protocols for ensuring patient consent, data protection and storage, and verifying health worker licenses and credentials.

JUSTIFICATION/REMARKS

- The guideline development group (GDG) noted that provider-to-provider telemedicine has the potential to improve access to quality care and to reduce the isolation of health workers working in remote settings.
- Although the cost of the telemedicine system may vary depending on the modality used (exchange of image files, voice calls, remote monitoring), the GDG felt that provider-to-provider telemedicine could support care delivery by peripheral health workers.
- Due to concerns about liability issues, the GDG suggested that standard operating procedures/protocols be established to ensure patient safety, privacy, traceability and accountability of services and to mitigate the potential harms of implementing provider-to-provider telemedicine.
- It was also noted that the nature of telemedicine is changing and that a wide range of delivery channels are being used across health workers to facilitate communication exchanges.

## 3.4 *Accessibility of health facilities and human resources for health:* CLIENT-TO-PROVIDER TELEMEDICINE


### CLIENT-TO-PROVIDER TELEMEDICINE
*(Recommended only in specific contexts or conditions)*

RECOMMENDATION 4

**WHO recommends client-to-provider telemedicine:**

- **under the condition that it complements, rather than replaces, face-to-face delivery of health services; and**
- **in settings where patient safety, privacy, traceability, accountability and security can be monitored.**

In this context, monitoring includes the establishment of standard operating procedures that describe protocols for ensuring patient consent, data protection and storage, and verifying health worker licenses and credentials.

JUSTIFICATION/REMARKS

The guideline development group (GDG) felt that despite the mixed available evidence on effectiveness spanning a wide range of health conditions, client-to-provider telemedicine has the potential to expand access to health services. It may also potentially reduce the burden of travel and decrease inequities for populations that have difficulties in accessing health services through conventional approaches.

- This recommendation recognizes that while telemedicine may enhance access to health services, it should not be used to replace or detract from efforts to strengthen the health workforce.
- The establishment of standard operating procedures and mechanisms to ensure patient safety, privacy, traceability and accountability of services was deemed to be a necessary condition to mitigate the potential risks and harms of implementing this recommendation.

***Source:*** *WHO. Recommendations on digital interventions for health system strengthening. Geneva: World Health Organization; 2019*

## Annex 2. List of facilities reporting the use of telehealth

The following facilities reported the use of telemedicine and telehealth and participated in the review

| № | Oblast | Facility |
|---|---|---|
| 1 | Bishkek | OFMC (Oblast Family Medicine Center) of Pervomaiskiy district |
| 2 | Bishkek | OFMC of Oktyabrskiy district |
| 3 | Bishkek | OFMC of Svedlovskiy district |
| 4 | Bishkek | OFMC of Leninskiy district |
| 5 | Bishkek | RAIDS center- RC on AIDS, 9 oblast centers on AIDS |
| 6 | Bishkek | Republican Clinical Infectious Diseases Hospital (RCIDH) |
| 7 | Bishkek | National Mother and Child Health Center (NMCHC) |
| 8 | Bishkek | National Center of Cardiology and Therapy (NCCT) |
| 9 | Bishkek | National Surgical Center (NSC) |
| 10 | Batken | Batken Oblast FMC (BOFMC) |
| 11 | Batken | Batken Oblast joint hospital (BRJH) |
| 12 | Jalal-Abad | Jalal-Abad Oblast Joint Clinical Hospital (JOJCH) |
| 13 | Jalal-Abad | Jalal-Abad Oblast Center for Tuberculosis Control (JOCTC) |
| 14 | Jalal-Abad | Territorial Hospital (TH) of Toktogul district |
| 15 | Jalal-Abad | FMC of Nooken district |
| 16 | Jalal-Abad | FMC of Kochkor-Ata |
| 17 | Issyk-Kul | Ton District TH |
| 18 | Issyk-Kul | General Practice Center (GPC) of Jeti-Oguz District |
| 19 | Issyk-Kul | Issik-Kul Oblast Joint Hospital (IOJH) |
| 20 | Naryn | Ak-Tali district FMC |
| 21 | Naryn | At-Bashi district FMC |
| 22 | Naryn | Naryn FMC |
| 23 | Naryn | Kochkor FMC |
| 24 | Naryn | Naryn oblast FMC |
| 25 | Naryn | Naryn Oblast Joint Hospital (NOJH) |
| 26 | Osh | Osh Oblast (Osh Interregional Children's Clinical Hospital (OICCH) |
| 27 | Osh | Osh Interregional Joint Clinical Hospital (OIJCH) |
| 28 | Osh | Nookat TH |
| 29 | Osh | Osh City Clinical Hospital (OCCH) |
| 30 | Osh | FMC in Osh |
| 31 | Talas | Talas OblastJoint Hospital (TOJH) |
| 32 | Talas | Kara-Buura TH |
| 33 | Chuy | Chuy Oblast FMC |
| 34 | Chuy | Chuy Oblast Joint Hospital (CRJH) |
| 35 | Chuy | Sokuluk FMC |
| 36 | Chuy | Jayil TH |

## Annex 3. Key Informant interviews conducted

| Oblast | Name of facility | Physicians | Facility administrator | Nurses | IT specialists | Project Managers | Policy makers/Org leadership | Total interviews |
|---|---|---|---|---|---|---|---|---|
| **Facilities with telemedicine/telehealth projects** | | | | | | | | |
| Bishkek | National Hospital | 1 | 1 | | 1 | | | 3 |
| Bishkek | National Maternal and Child Health Center | 1 | | | | | | 1 |
| Osh | Osh Interregional Joint Clinical Hospital | 3 | | | 1 | | | 4 |
| Osh | Osh Interregional Children's Hospital | 2 | | | 1 | | | 3 |
| Naryn | Naryn Oblast Hospital | | 1 | | 1 | | | 2 |
| Naryn | At Bashy Rajon Hospital | 1 | | | 1 | | | 2 |
| **Facilities without telemedicine/telehealth projects** | | | | | | | | |
| Osh | FMC Kara Suu | 1 | | | | | | 1 |
| Osh | Kara Suu Territorial Hospital | 1 | | | | | | 1 |
| Naryn | FGP, Naryn | 1 | 1 | | 1 | | | 3 |
| Naryn | FAP, Jan Bulak Village | | 1 | 1 | | | | 2 |
| **Health organizations that implemented telemedicine/telehealth projects** | | | | | | | | |
| Bishkek | Swiss Re. Foundation | | | | 1 | 2 | | 3 |
| Bishkek | KSMIRCT | | 1 | | | | | 1 |
| Bishkek | Aga Khan Foundation | | | | | 1 | | 1 |
| **Other key stakeholders** | | | | | | | | |
| Bishkek | Ministry of Health | | | | | | 2 | 2 |
| Bishkek | eHealth Center | | | | | | 2 | 2 |
| Bishkek | Mandatory Health Insurance Fund | | | | | | 1 | 1 |
| Bishkek | UNICEF | | | | | | 3 | 3 |
| | **Total** | **11** | **5** | **1** | **7** | **3** | **8** | **35** |

## Annex 4. MICS 2018 ICT indicators

| MICS Indicator | Definition | Value |
|---|---|---|
| SR.1 | Percentage of household members with access to electricity | 100.0 |
| SR.6 | Percentage of households that have a telephone (landline or mobile phone)<br>(a)Basic mobile telephone<br>(b)Smartphone | 99.2<br>72.7<br>79.2 |
| SR.7 | Percentage of households that have a computer | 27.1 |
| SR.8 | Percentage of households that have access to the internet by any device from home<br>Urban<br>Rural | 70.1<br>76.0<br>65.3 |
| SR.10 | Percentage of women aged 15-49 who own a mobile phone | 93.3 |
| SR.11 | Percentage of women aged 15-49 who used a mobile phone during the last 3 months | 92.7 |
| SR.12a<br>SR.12б | Percentage of women age 15-49 years who used the internet<br>(a) during the last three months<br>(b) at least once a week during the last three months | 77.5<br>73.7 |

***Source:*** *National Statistical Committee of the Kyrgyzstan and UNICEF. 2018 Kyrgyzstan Multiple Indicator Cluster Survey, Snapshots of Key Findings. Bishkek, Kyrgyzstan: National Statistical Committee of the Kyrgyzstan and UNICEF; 2019.*

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