POLICY BRIEF

An Analysis of Digital Readiness and Utilization in KP's Primary Healthcare Sector

May 2025 – No. 7 | KfW - Implementation Research on OPD Services in the SHPI, Pakistan

KEY MESSAGES

1. Digital readiness: We observed limited system preparedness for the introduction of digital technologies across all dimensions we evaluated – infrastructural and environmental readiness; healthcare workers' awareness, digital literacy, and skills; and safeguards. Respondents cite budgetary constraints as the primary obstacle to making investments that would enable meaningful change and move beyond the status quo.
2. Current Utilization: Private healthcare facilities lead the way in embracing digital technologies, utilizing them for a broader range of applications and purposes, including management-related tasks and Electronic Medical Records. Still, even in private facilities, mHealth and telemedicine have not been introduced at all. In public health facilities, use of digital technologies is often limited to the DHIS-II application, mainly in parallel to manual records.
3. Perceptions: While healthcare providers express strong support for increased use of digital tools, they also identify lack of infrastructure and competencies as major obstacles that must be addressed before such technologies can be effectively deployed.

BACKGROUND & MOTIVATION

The first phase of the Social Health Protection Initiative (SHPI) in KP provided access to free inpatient care for vulnerable populations. To further enhance access and social health protection, the government is now about to launch an additional scheme covering outpatient (OPD) care. Given increasing interest among local stakeholders to introduce digital solutions as a means of improving care and facilitating the implementation of both the secondary care and the upcoming OPD scheme, we investigated the current state of digital readiness for implementing these initiatives among both public and private healthcare facilities in KP. Our aim is to provide health authorities and their partners with the information necessary to effectively leverage the potential of digital health.

METHODS

The insights described in this brief are based on primary quantitative and qualitative data collected between October 2024 and February 2025. Quantitative data were gathered from our panel of 98 public and 74 private facilities across the districts of Chitral, Kohat, Malakand, and Mardan, including the full spectrum of facility types offering primary care. In each facility, we used structured surveys with managers (n=172) and with healthcare workers (n=613) to collect information on availability of digital technologies and their use, with specific reference to elements relevant for health financing functions, as well as on the skills of healthcare professionals to engage with such technologies. Qualitative data were

gathered from medical officers operating in 18 facilities, comprising 12 publicly and 6 privately owned healthcare providers in Mardan district, where the OPD scheme is being first launched. We sampled facilities purposely based on the empanelment cutoff set by the upcoming OPD scheme. This led to the inclusion of public facilities across all levels of care, while only large private health facilities with the highest empanelment scores were selected (all multiple specialist practices with inpatient capacity). Our sampling criteria entail that information gathered qualitatively inevitably reflects the perspective of higher-quality healthcare providers. We also interviewed the District Health Officer in Mardan as a key informant.

In line with the mixed-methods nature of our data collection and analysis, hereafter we present our core findings relevant for policy organized by thematic area, using a combination of descriptive statistics and qualitative insights from the interviews.

RESULTS

Lesson 1: Digital Readiness

Lesson 1a: Available hardware, software, and connectivity

"Network connectivity is a common issue faced by everyone, not just our facility. Currently, we don't have Wi-Fi, and having it arranged for us would be a significant improvement to our system." – Medical In-charge, BHU, Mardan.

Digital preparedness in healthcare facilities is hindered by limited availability of necessary hardware. Over 40% of private facilities and nearly two-thirds of public facilities rely solely on privately owned phones due to the absence of facility-owned landline or mobile devices. Moreover, 20 public and 28 private facilities lack even a single tablet or computer. Furthermore, limited internet access exacerbates connectivity issues, particularly in public facilities. Half of all facilities also lacked software availability, with internal solutions (i.e., software tailored to facility-specific needs, unlike off-the-shelf software) being most commonly used. Qualitative interviews consistently highlighted inadequate infrastructure as a major barrier to effective digital technology adoption.

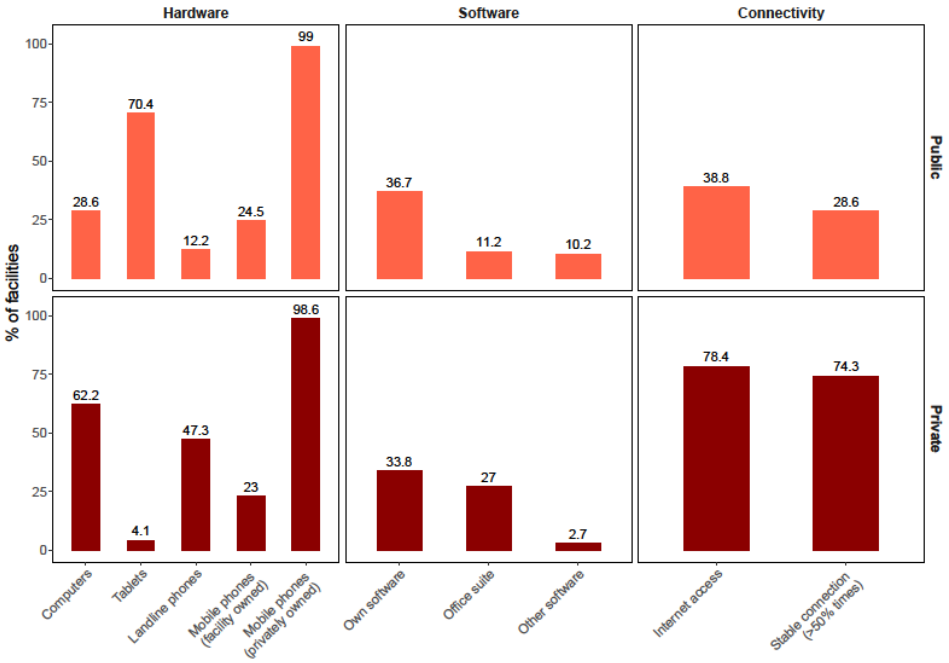

Figure 1. Availability of hardware, software, and internet connectivity according to managers, stratified by type of facility
Access to (stable) internet is defined as at least one (stable) connection, whether cabled/Wifi, cellular or both. Hardware availability is classified based on the ownership of at least one device.

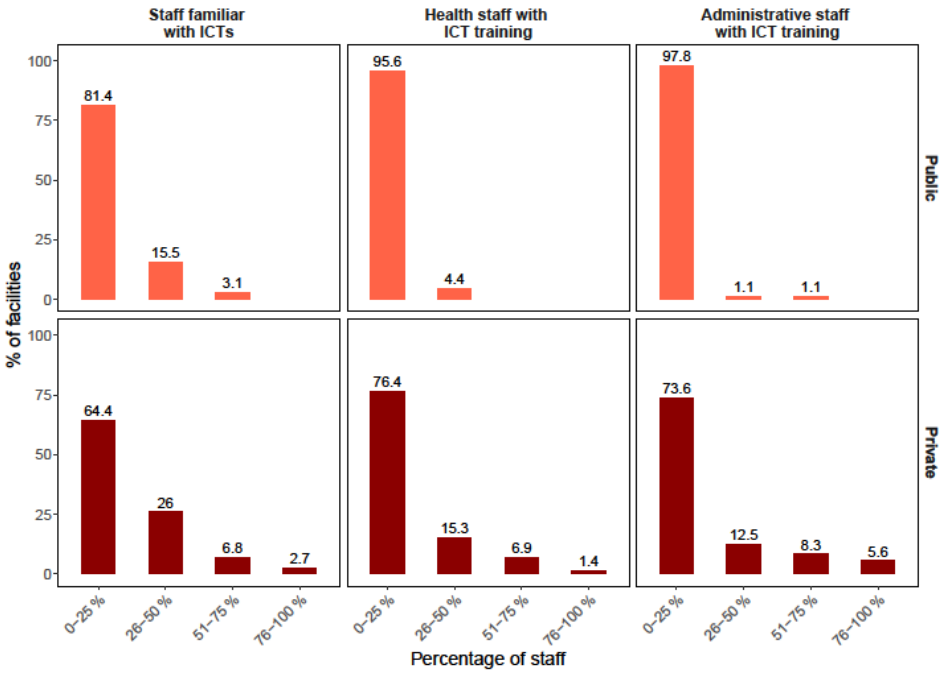

Figure 2. Digital competencies of staff based on management interviews, stratified by facility type

Lesson 1b: Awareness, digital literacy and skills

"When those persons [IT experts] come monthly, if we face any issues with the tools, they fix them and also provide training to our staff regarding that issue" – Medical In-charge, private facility with inpatient care, Mardan

Skills, knowledge, and awareness of digital technologies are limited in healthcare facilities. Public managers' familiarity with KP's digital policy and with the national priorities on digital health for non-communicable diseases is constrained (up to 15%), while private managers show even lower levels of understanding (up to 8%). Most managers estimate that less than 25% of staff have ICT skills (81% for public managers, 64% for private). In the vast majority of facilities, managers also acknowledged that fewer than 25% of administrative staff and healthcare workers received ICT training (public: ≥94%, private: about ≥74%). In line with that, healthcare workers reported that training opportunities are either very limited (about 13%) or generally not available (>70% of healthcare workers). Moreover, professional ICT support to compensate for limited personal abilities is scarce, with 74% and 62% of public and private healthcare workers lacking it in their facilities, respectively. Qualitative interviews revealed a shortage of trained staff in IT sections at public facilities, leading to reliance on untrained personnel or class four staff. Private facilities tend to employ a small number of experts that offer staff training and help in solving difficulties or issues with digital tools.

Lesson 1c: Safeguards

Data protection guidelines are lacking in many healthcare facilities. While about one-third of healthcare workers report being aware of data protection guidelines, regardless of their specific application, only 6 public and 11 private managers claim that their facility has introduced policies addressing privacy and data protection when using digital technologies. Notably, the number of managers who responded 'don't know' is about as high or even higher (public: N=46, private: N=20) than those acknowledging the absence of any standards (public: N=45, private: N=42), suggesting a low level of awareness on this critical issue.

Lesson 2: Current utilization of information and communication technologies.

"Now the entire system is digital. Everything is computerized, there is software and systems. Our pharmacy, accounts, and even the prescription process is digitized. Everything is managed from the reception." – Medical In-charge, Private Hospital, Mardan

"We utilize the DHIS-II software. […] The manual data entry process is time-consuming. Ideally, it should be done on the spot. Currently, we enter data into the tablet [provided by the DHO] a day later: information from our register, OPD records, patient details, LHV data, and EPI data." – Medical In-charge, BHU, Mardan

Private healthcare facilities lead the way in embracing digital technologies, utilizing them for a broader range of applications and purposes. In particular, only some private (10.8%) but no public facilities have introduced Electronic Medical Records (EMRs). Moreover, private providers leverage ICTs three times more frequently than public facilities for management-related tasks (private: 36.5%; public: 10.2%). Among private providers interviewed qualitatively, nearly all reported using Hospital Management Information Systems.

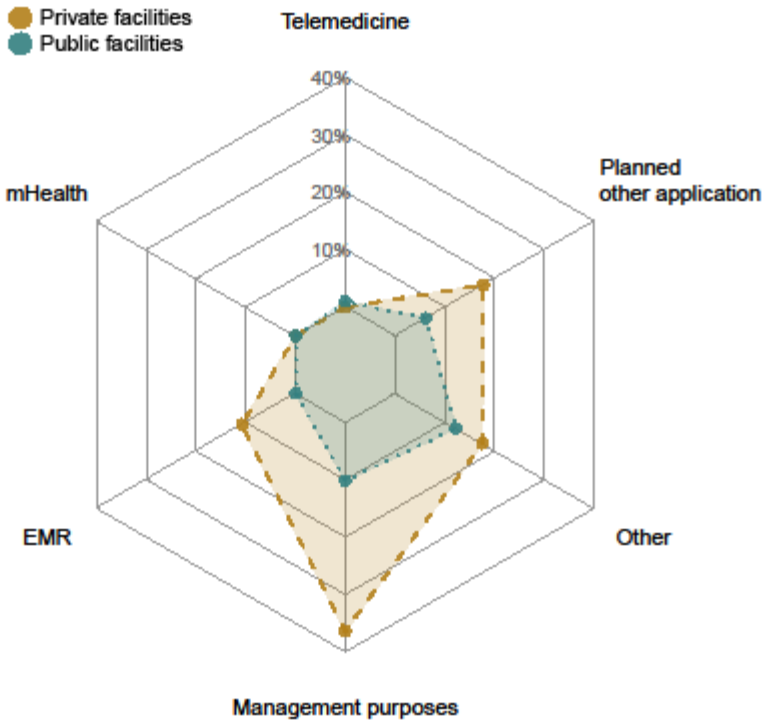

Figure 3. Utilization of information and communication technologies across potential applications

In contrast, electronic DHIS reporting is the most common application among public healthcare facilities. Yet, only 8.2% of public providers rely exclusively on digital DHIS-II reporting while 75.5% combine digital reporting with traditional manual records. Qualitative interviews revealed that higher-level public facilities also use DHIS-II systems to manage their own information on patient flows, while lower-level facilities, due to connectivity problems, only rely on the system to report aggregate patient flow data to the district. Only a single public facility reported having implemented telemedicine for live video consultations, while none have introduced mHealth solutions as yet.

Lesson 3: Perceptions

"We need a system in which, when a patient visits a facility, there is data on the patient that allows them to know about the patient. Every hospital needs to have a system that allows them to be interconnected." – Medical In-charge, Private Hospital, Mardan

Healthcare providers overwhelmingly endorse digital tools, with 87-95% of managers and healthcare workers agreeing that ICTs enhance daily routines, efficiency, and care quality.

Conversely, less than 5% expressed skepticism towards technology adoption. In qualitative interviews, all respondents across public and private facilities concurred on the potential benefits of digital technologies in streamlining facility operations and ensuring continuity of care.

Lesson 4: Future Intentions

"We don't have digital tools here. I am trying to bring those things here, but the problem is that they are very expensive, and we cannot afford them. Their software is very expensive and we don't have that kind of budget, we have budget deficiency." – Medical In-charge, Category D Hospital, Mardan

Looking ahead, 6 public and 13 private facilities plan to leverage ICTs for new applications, such as electronic medical records, laboratory reports, and health promotion initiatives. With few exceptions, respondents did not explicitly refer to investing in digital technologies for health financing. Notably, one-third of private facilities intend to invest in staff training, a promising sign of capacity building. In contrast, only 14.7% of public facilities share this intention. However, qualitative interviews suggest that this reluctance is not attributable to lacking willingness but rather stems from budgetary constraints that hinder infrastructure development and staff upskilling.

RECOMMENDATIONS

Based on our findings, we formulate and contextualize the following policy recommendations:

1. To address the significant gaps in digitalization across KP's health system, we recommend that policy makers: **a) Identify priority areas** for the introduction of digital solutions and **develop a strategic plan** outlining health system objectives, resources needed, timelines, and implementation strategies. **b) Decide collectively on short- and medium-term priorities** given resource constraints.
2. Since budgetary constraints are repeatedly recognized as the major barrier to further digitalization of the health system, we urge development partners to support setting up the basic necessary capacity and system preparedness. **Before investing in digital technologies targeting specific health system functions** (e.g., claim management, referral, insurance registration), we urge for sustained investments in: **a) Establishing basic hardware and software infrastructure; b) Strengthening human resource capacity; and c) Institutionalizing data handling and data protection** regulations and practices.
3. The co-existence of public and private facilities, with different capacity levels, presents a challenge to the development of a unified set of digital solutions in KP. Moreover, although sparse, the digital landscape in KP is not void (e.g., DHIS2 use in all public facilities). To ensure a unified approach across public and private facilities, it is advisable to: **a) Remain attentive to context** as it evolves over time; and **b) Develop digital solutions** that can be governed by (semi)-public authorities but **offered for use to both public and private providers alike**. This will facilitate integration and interoperability, while avoiding duplication.

Authors of the note
Sarah Wetzel, Khalid Rehman, Stephan Brenner, Swati Srivastava, Fayaz Ahmad, Phidelis Wamalwa, Aleen Durrani, Zohaib Khan, Manuela De Allegri

The research consortium
Principal Investigators:
Andreas Landmann (FAU)
Manuela De Allegri (HIGH)
Zohaib Khan (KMU)

Scientific Team
Lisa Rogge (FAU), Alina Imping (FAU), Vendula Stepanikova (FAU), Simona Helmsmüller (H-RBS), Sarah Wetzel (HIGH), Maira Shaukat (HIGH), Phidelis Wamalwa (HIGH), Aleen Durrani (HIGH), Stephan Brenner (HIGH), Swati Srivastava (HIGH), Fayaz Ahmad (KMU), Khalid Rehman (KMU), Safat Ullah (KMU), Zeeshan Kibria (KMU)