

WHO GUIDELINE

# RECOMMENDATIONS ON DIGITAL INTERVENTIONS FOR HEALTH SYSTEM STRENGTHENING

EVIDENCE AND RECOMMENDATIONS



World Health  
Organization



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# EVIDENCE AND RECOMMENDATIONS

This guideline provides ten evidence-based recommendations on the digital health interventions that were prioritized during the scoping process (see sections 2.1 and 2.2). These recommendations are made with the expectation that their implementation is grounded in an understanding of the ecosystem readiness and maturity, as outlined in Chapter 4. For each of the digital health interventions reviewed in this guideline, this chapter elaborates on the following components:

- ▶ background information on the specific digital health intervention
- ▶ an overview of the specific evidence
- ▶ the recommendation along with a justification and remarks
- ▶ specific implementation considerations.

Overall gaps in the evidence are described in Chapter 5; specific gaps and research questions for each of the interventions is detailed in Annex 5. In addition, Web Supplement 1 contains the evidence-to-decision frameworks and elaborates on the specific findings for each intervention as it relates to its effectiveness, acceptability, feasibility, resource use, and gender, equity and human rights concerns. The Web Supplements cited here are available at [www.who.int/reproductivehealth/publications/digital-interventions-health-system-strengthening/en/](http://www.who.int/reproductivehealth/publications/digital-interventions-health-system-strengthening/en/)

Although the systematic reviews included accessibility via mobile devices to ensure that these digital interventions are applicable in low resource settings where extensive computerized systems may not be available, it does not preclude the recommended interventions from being used on non-mobile digital devices, such as desktop computers.

## 1.1 Cross-cutting acceptability and feasibility findings

Most of the digital health interventions in this guideline are targeted at or expected to be used by health workers. The following findings point to factors that influence the acceptability and feasibility of digital interventions used by health workers. These findings are based on qualitative

evidence syntheses and overviews of digital health interventions for health workers in primary care (Web Supplement 2A); mLearning (Web Supplement 2B) stock notification and tracking commodities (Web Supplement 2D), and birth and death notification (Web Supplement 2E).

## ACCEPTABILITY FOR HEALTH WORKERS

### *Factors that may increase acceptability*

Digital health interventions allow health workers to **expand their range of tasks** as well as take on tasks previously assigned to higher-level workers. This can be experienced as satisfying and fulfilling, both for those to whom tasks are shifted, as well as to those from whom tasks are shifted (moderate confidence, Web Supplement 2A). Health workers working in rural and remote contexts particularly appreciate the **efficiency** of digital health technologies as these allow them to offer services through the device (moderate confidence, Web Supplement 2A). Health workers are likely to perceive digital health technologies to be more efficient because of the **increased speed** with which they allow them to work (moderate confidence, Web Supplement 2A). These technologies are also likely to **save travelling time** for health workers in both urban and rural settings, allowing them to spend more time with their clients<sup>1</sup> in urban areas or to provide services remotely to clients in rural areas (moderate confidence, Web Supplement 2A). Health workers may appreciate the **portability** of digital health technologies because this allows them to be **flexible**, to work when convenient, and not have to be office-bound to access information (low confidence, Web Supplement 2A). Health workers, particularly lay health workers in low- and middle-income settings, also perceive digital health technologies as allowing them to better **coordinate the delivery of care through connecting them to other people and sectors** in the health system and to clients and communities (moderate confidence, Web Supplement 2A).

Some health workers also report that digital health technologies **raise their social status** and increase the trust and respect they receive in communities. This is in part due to the device itself but is also because they use these devices to access health workers at higher levels of care. Community health workers, feel that the devices **increase the respect they receive from health professionals** and from the community (moderate confidence, Web Supplements 2A and 2E). Similar findings are seen among health workers in training, although there is also some concern that clients/patients and colleagues might regard their use of mobile devices as unprofessional because of their association with recreation (low confidence, Web Supplement 2B ).

### *Factors that may decrease acceptability*

Some health workers do not experience digital health interventions as efficient as these interventions **do not reduce their workload and in some cases increase their workload** (moderate confidence, Web Supplement 2A), making them less likely to accept these interventions (moderate confidence, Web Supplement 2F). Health workers may perceive digital health interventions as increasing their workload when it means maintaining two systems (i.e. digital and paper-based), when there are staff shortages, when the addition of the digital health intervention

<sup>1</sup> Although WHO's *Classification of digital health interventions v1.0* uses the term "client" (13), the terms "individual" and "patient" may be used interchangeably, where appropriate.

to current work is not understood and appreciated by supervisors, or when they themselves perceive the intervention as peripheral to their work. While some health workers do not object to the additional work, others expect to be remunerated for it (low confidence, Web Supplements 2A and 2E).

Health workers may also be concerned about **loss, damage and theft** and may complain about having to carry both a personal and a work phone (low confidence, Web Supplements 2A and 2B). In some settings, health workers use their personal mobile phones and Internet access for work purposes, although this use is not necessarily formalised and **health worker expenses are not always covered** (low confidence, Web Supplements 2A and 2E). This can include expenses for air time or for charging their phone. Health workers may see these personal costs as a burden. However, they may feel a moral imperative to assist their clients by using their own phones despite the personal costs this incurs (low confidence, Web Supplement 2A).

Health workers' perceptions and experiences of digital health interventions are likely to be **shaped by their pre-existing digital literacy**. Health workers who manage well have positive views about the use of mobile devices. However, health workers who struggle to use these technologies have negative perceptions about its usefulness, may not understand the information generated by these technologies, and are also anxious about making errors. In some instances, poor digital literacy **threatens job security** (high confidence, Web Supplement 2A). However, even technologically more competent users are reported as needing support and repeat training in the use of the programmes and devices (low confidence, Web Supplement 2B).

## FEASIBILITY FOR HEALTH WORKER

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Many health workers, particularly in rural and remote areas, experience logistical challenges when using digital health technologies, including **poor network connectivity and access to electricity** to charge their mobile phones (high confidence, Web Supplements 2A, 2B, 2D, 2E and 2F). In some instances, poor connectivity also results in client dissatisfaction because it creates delays in receiving health services (high confidence, Web Supplement 2A).

Health workers want easy-to-use, reliable equipment and ongoing technical support (high confidence, Web Supplements 2A, 2D and 2F). They also feel that the use of these technologies can be expanded to a wider range of settings, services, and illnesses (high confidence, Web Supplement 2A). However, health workers often report **usability issues**, and **poor integration with other digital systems** (high confidence, Web Supplements 2C and 2F). Although the introduction of digital health interventions into existing healthcare systems may be important, this requires many changes and may be difficult to achieve (low confidence, Web Supplement 2F). For instance, institutional support and local champions may be considered important for ensuring integration into existing systems, but staff reorganization and the breakdown of existing partnerships may undermine this support (low confidence, Web Supplement 2F).

Health workers may experience a number of **problems with the design of the programmes or of the device itself**, including programmes in languages they are not proficient in, inaccurate rendering of the local language font, small screens, devices being ill-suited for note-taking, and SMS character limitations (low confidence, Web Supplement 2A and 2B). Although the involvement of staff and clients in the planning, design and implementation of the digital system is considered important by health workers (moderate confidence, Web Supplements 2A and 2D), this is not always done (moderate confidence, Web Supplement 2F). Health workers may be dissatisfied with digital health when technology changes are too rapidly introduced, or when their expectations of the technologies are not met (low confidence, Web Supplement 2A).

Some stakeholders are also concerned about the **confidentiality of medical information and data security** (moderate confidence, Web Supplement 2F). Health workers may try to protect clients' confidential information when using digital health devices, in particular when the information concerns stigmatised conditions such as HIV/AIDS (low confidence, Web Supplement 2A). Achieving informed consent for sharing records and images can also be challenging, particularly in settings with low levels of basic literacy or digital literacy (moderate confidence, Web Supplement 2F).

**Training is important** for staff acceptance and system use (high confidence, Web Supplements 2A, 2B, 2D, 2E and 2F). While some health workers experience **difficulties in understanding and using digital health** technologies, health workers and trainers feel that **training and familiarity with these technologies can help** overcome these difficulties. Some health workers feel hampered in learning to use mobile health technologies if it is not also used by their clinical mentors (moderate confidence, Web Supplement 2A). This may be particularly important as health workers requiring technical support may receive this support from higher level staff or from peers (low confidence, Web Supplement 2A). **Supportive supervision is also considered important** for staff acceptance and system use (moderate confidence, Web Supplement 2D).

Digital systems can make it possible to track and monitor health workers' activities. Health workers may feel that this changes how they work and **may make their work more visible**. Some health workers may perceive this as **positive**, but it may leave other health workers with the sense of **"big brother watching"**. Supervisors may feel that this allows them to be more aware of the work of lower level health workers and to address problems (low confidence, Web Supplements 2A and 2D).

Even where challenges tied to the design and usability of digital systems and devices are addressed, these systems **may not be able mitigate a number of broader health systems challenges**, for example, an underlying lack of medical commodities (low confidence, Web Supplement 2D).

## ACCEPTABILITY AND FEASIBILITY FOR CLIENTS/INDIVIDUALS

The following findings point to factors that are likely to influence the acceptability and feasibility of digital health interventions targeted at or expected to be used by clients/patients. These findings are summarized based on overviews and qualitative evidence syntheses related targeted client communication (Web Supplement 2C) and telemedicine (Web Supplement 2F). More detailed descriptions on the acceptability and feasibility findings are available within the sections focused on the specific interventions.

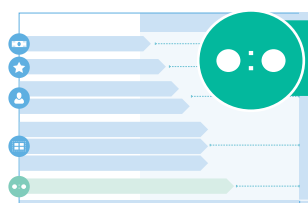
Some individuals describe targeted communication and telemedicine services in positive terms. For instance, some clients appreciate the fact that someone is taking the time to send them messages as this can make them feel like someone is interested in their situation and invested in their well-being. These clients describe the messages as **providing support, guidance and information**, and **giving a sense of direction, reassurance and motivation** (moderate confidence, Web Supplement 2C). Similarly, some clients using telemedicine services see these as **offering reassurance and a sense of safety** and appreciate the increased access and the consistency and continuity of care that it can offer (low confidence, Web Supplement 2F). Some clients also feel that telemedicine services have increased their **independence and self-care** (low confidence, Web Supplement 2F).

However, individuals who are dealing with health conditions that are often stigmatised or very personal (e.g. HIV, family planning and abortion care) **worry that their confidential health information will be disclosed** or their identity traced due to their participation in targeted communication programmes (high confidence, Web Supplement 2C). Some individuals using telemedicine services **prefer face-to-face contact** (low confidence, Web Supplement 2F). Additionally, individuals believe there should be **little or no charge** tied to digital health programmes, such as joining the programme, downloading apps, or charges related to sending and receiving SMS/phone calls (high confidence, Web Supplement 2C).

Targeted communication and telemedicine services can potentially increase access for some groups of individuals. For instance, telemedicine services can give **individuals who speak minority languages** access to health workers who speak this language (high confidence, Web Supplement 2F); and may save money and reduce the burden of travel for **clients with caring or work responsibilities, living far from health care facilities or with few funds** (low confidence, Web Supplements 2C and 2F).

However, access to and use of these services can be particularly difficult for some individuals. These include individuals with **poor access to network services, electricity** (high confidence, Web Supplement 2C) **or mobile devices** (moderate confidence, Web Supplements 2A and 2C); clients who speak **minority languages**, have **low literacy or digital literacy skills** (moderate confidence, Web Supplement 2C) or **hearing impairments** (high confidence, Web Supplement 2A). Clients with **stigmatized health conditions** may also be particularly concerned about the privacy of their information (high confidence, Web Supplement 2C).

## 1.2 Accountability coverage: BIRTH AND DEATH NOTIFICATION



### ACCOUNTABILITY COVERAGE

The proportion of those in the target population registered into the health system

#### ILLUSTRATIVE HEALTH SYSTEM CHALLENGES

Lack of population denominator

Lack of access to information or data

Delayed reporting of events

### BACKGROUND

A global scale-up plan for strengthening civil registration and vital statistics (CRVS) systems has been developed by the World Bank and WHO with the goal of achieving “universal civil registration of births, deaths and other vital events, including reporting cause of death, and access to legal proof of registration for all individuals by 2030” (57). A key component of this plan is to prioritize and strengthen the linkages between CRVS systems and health (57–59). This includes the use of digital information systems to strengthen CRVS systems and expanding the coverage of registration services among underserved populations, such as people residing in rural areas (57–60). In these respects, the global proliferation of mobile phones and cellular network connectivity (41) is increasingly being leveraged, especially in resource-limited settings, to drive the development and use of digital civil registration systems (11,12,60–63).

Notification is the capture and onward transmission of minimum essential information on the fact of birth or death has occurred, and represents the first step in the process leading to eventual registration and certification of the vital event. Increasing the efficiency of birth and death notification as well as promoting linkages between the health and civil registry sectors (many births are first known in the health sector) can strengthen civil registration processes and the use of health services (61,62). Digital mechanisms to facilitate notifications may enhance these

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