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Regional strategy for fostering digital health in the Eastern Mediterranean Region (2023–2027)

Executive summary

Digital health can strengthen and improve the accessibility, quality, efficiency and cost-effectiveness of national health systems, enhancing health care delivery and systems through seamless connectivity and access to health information. Digital technologies can help to increase coverage of health services including in remote, rural and migrant settings, as well as enhance emergency response and improve monitoring of processes and outcomes. Many of these aspects are particularly important in the Eastern Mediterranean Region of the World Health Organization (WHO), where several Member States are experiencing socioeconomic inequalities and ongoing emergencies.

The opportunities and challenges of digital health were particularly highlighted during the COVID-19 pandemic response. Issues include the implementation costs of digital health, weak and fragmented governance, data security, privacy, lack of protection against risks from improper use, and language barriers. WHO surveys in 2021–2022 showed that the majority of Member States of the Region have some relevant policies, strategies and/or legislation in place; however, a minority of countries fully realized the potential of digital health applications during the pandemic and only seven countries have a national digital health strategy. Strategic direction is needed to fully realize the potential of digital health in countries and territories of the Region.

This direction will be provided by four strategic objectives: (1) strengthening digital health governance, norms and standards at regional, national and subnational levels; (2) advocating for people-centred digital health systems and networks appropriate to their regional and national context; (3) advancing the development, implementation and evaluation of national digital health strategies, consistent with digital health maturity and linked to advancing national capacities and digital health literacy; and (4) promoting regional and national stakeholder collaboration towards advancing digital transformation, knowledge translation and innovation.

Member States, in collaboration with stakeholders, are encouraged to develop digital health strategies, action plans with roadmaps, national digital health architecture and investment plans. They should allocate resources and encourage national investment in standards-based and interoperable digital health systems at both national and district levels. There is a need for national capacity-building for digital health and related innovations, as linked to country health and public health priorities. To support this process, WHO will provide technical support and relevant resources for the development of national action plans and setting of norms and standards, and will coordinate the involvement of relevant United Nations agencies and stakeholders in priority digital health programmes.

Introduction

1. Digital health aims to strengthen and improve the accessibility, quality, efficiency and cost–effectiveness of national health systems. Digital health enhances health care delivery and systems through seamless connectivity and access to health information; better accessibility, delivery, coverage and quality of health care services, including in remote, rural and migrant settings; and enhanced emergency response and monitoring of processes and outcomes.

2. The effective implementation of digital health technologies is increasingly recognized as being crucial to efficient national and subnational health systems. Countries across the world are looking for evidence-based solutions and optimal investments in digital health to address national and subnational health priorities *(1)*. This is particularly important in the Eastern Mediterranean Region, given the socioeconomic inequalities and ongoing emergencies in several of its countries.

3. Countries are also concerned with the implementation costs of digital health, their governance challenges, data security and privacy, and potential risks to health systems and individuals when digital health is inappropriately used without protections in place. These opportunities and challenges have been highlighted during the COVID-19 pandemic response.

4. WHO Member States unanimously adopted resolution WHA71.7 *(2)* at the Seventy-first World Health Assembly in 2018 in support of digital health. Subsequently, a draft global strategy was endorsed by the Executive Board (EB146/26) *(3)*, resulting in the Global Strategy on Digital Health 2020–2025 *(4)* which was endorsed by the Seventy-third World Health Assembly in 2020 in decision WHA73(28) *(5)*.

5. The Global Strategy *(4)* defines digital health as: "the field of knowledge and practice associated with the development and use of digital technologies to improve health." It states its vision as being:

> to improve health for everyone, everywhere by accelerating the development and adoption of appropriate, accessible, affordable, scalable and sustainable person-centric digital health solutions to prevent, detect and respond to epidemics and pandemics, developing infrastructure and applications that enable countries to use health data to promote health and well-being, and to achieve the health-related Sustainable Development Goals and the triple billion targets of WHO's Thirteenth General Programme of Work, 2019–2023.

6. The Global Strategy has four strategic objectives, the first relating to collaboration and knowledge transfer; the second to national digital health strategy implementation; the third to digital health governance; and the fourth to people-centred health systems. Therefore, national strategies should take account of the following core components: (a) leadership and governance; (b) investment and operations; (c) services and applications; (d) integration and sustainability; (e) standards and interoperability; (f) a flexible digital infrastructure; (g) an adaptable health workforce; (h) legislation, ethics policies and compliance; and (i) a people-centred approach *(4)*.

7. To support governments in monitoring and coordinating digital health investments in their country, WHO developed the Digital Health Atlas *(6)*, an online global repository where implementers can register their digital health activities. WHO has established innovative partnerships with the International Telecommunication Union (ITU), for example, the BeHe@lthy, BeMobile initiative on mobile health (mHealth) services for the prevention and control of noncommunicable diseases *(7)* and the eHealth strategy toolkit *(8)*, and has made efforts to build digital health capacity through the WHO regional offices for Africa and the Eastern Mediterranean. Over the years, WHO has released a number of resources to strengthen digital health research and implementation, including the mHealth assessment and planning for scale toolkit *(9)*, a handbook on monitoring and evaluation of digital health *(10)* and an agenda for action to harness digital health to end tuberculosis *(11)*.

8. This paper proposes a regional strategy and action plan for fostering digital health in the Eastern Mediterranean Region (2023–2027) to guide countries and territories towards effective operationalization of the Global Strategy on Digital Health. The paper discusses the need for a regional strategy and for committing Member States and WHO to engage stakeholders in a dialogue to pursue the systematic use of digital health strategies, to support and mobilize resources for people-centred, impact-driven and sustainable investments in digital health, and to develop an action plan to accelerate implementation of the agenda within the next five years. WHO will provide technical support and policy advice for the development of national action plans, the setting of norms and standards, and coordination of relevant United Nations agencies and stakeholder involvement in priority digital health programmes.

Situation analysis

9. Member States of the Region participated in surveys conducted by WHO during 2018 and 2021–2022 *(12)*. The results showed that 15 (68%) countries reported having national digital health policies/strategies or being "in the process" of developing such strategies. Fourteen (64%) countries reported having legislation on data security and citizen privacy issues, 12 (55%) reported having common digital health terminologies and 12 (55%) reported having introduced electronic medical records systems.

10. In the regional survey (2021–2022), seven countries reported having a national digital health strategy, while others reported having an actionable list of activities within a strategic action plan to support universal health coverage and reform of health systems. Table 1 summarizes the reported situation of national digital health strategies in Member States of the Eastern Mediterranean Region.

Table 1. National digital health strategies in Member States of the Region, WHO 2021–2022 survey

Country	Does your country have a national eHealth (or digital health) policy or strategy?
Afghanistan	In process
Bahrain	Yes
Djibouti	No
Egypt	Yes
Iran (Islamic Republic of)	Yes
Iraq	No
Jordan	No
Kuwait	In process
Lebanon	In process
Libya	In process
Morocco	No
Oman	In process
Pakistan	In process
Palestine	In process
Qatar	Yes
Saudi Arabia	Yes
Somalia	In process
Sudan	Yes
Syrian Arab Republic	No
Tunisia	No
United Arab Emirates	Yes
Yemen	No

11. As noted above, a few countries/territories in the Region have developed national eHealth or digital health strategies and programmes, with varied levels of progress and success. Such strategies should be guided by the national health strategy and be seen as tools for progress towards achieving national health objectives. Engaging relevant stakeholders and focusing on institutionalizing the use of information and communication technology for the support of health and well-being should remain the key target *(13)*.

12. Fig. 1 summarizes the reported distribution of applications by main digital health category in Member States of the Region, according to the WHO 2021–2022 survey *(12)*. Examples of digital health applications in countries and territories are given in Annex 1.

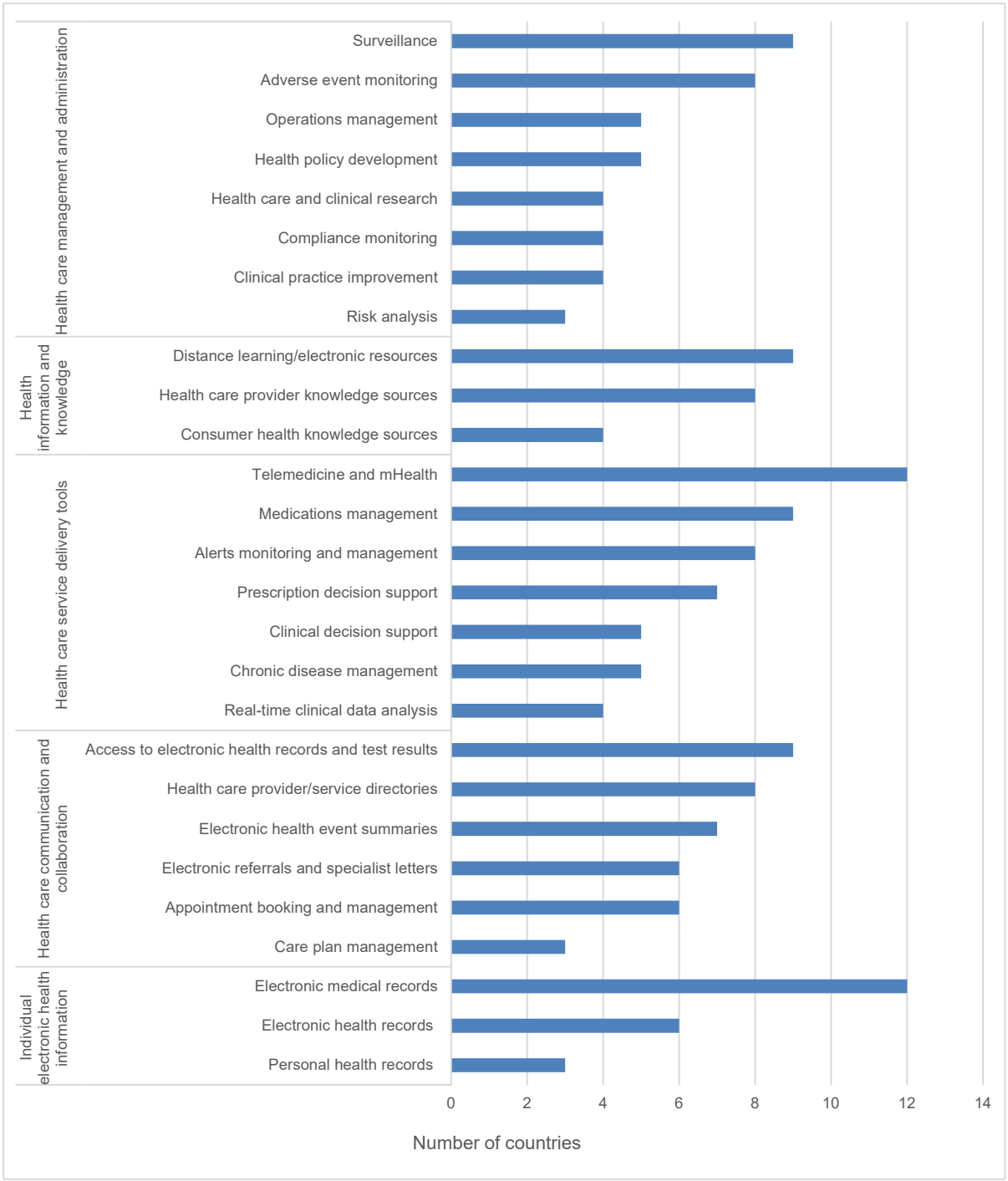

Fig. 1. Distribution of applications by main digital health category in Member States of the Region, WHO 2021–2022 survey

Table 2. Digital health service provision in the Region during the COVID-19 pandemic

Type of digital health service provided	Number of countries/territories of the Region reporting provision during the COVID-19 pandemic (out of 22)
Vaccine administration and management systems	15
Telemedicine or telehealth services	8
Diagnosis applications	6
Digital contact tracing	6
Chatbots	4
mHealth	3
Hospital bed dashboards	1

13. The 2021–2022 survey also focused on digital health services provided by Member States of the Region during the COVID-19 pandemic (Table 2).

14. The COVID-19 pandemic demonstrated the need for strategic approaches to planning and implementation of digital health. Countries with relatively advanced foundations, legislation and policies for the use of digital health services were able to implement solutions in support of the COVID-19 response more effectively. These solutions included strategies that aimed to enhance access to health care at times when extensive social distancing policies were being implemented. Such countries were able to optimize the use of limited resources to serve the people in greatest need and hence save lives.

15. The utility and efficiency of digital technologies for health was clearly demonstrated during the COVID-19 response, when many countries of the Region moved forward with digital health facilities, applications and services that were highly useful in all response phases and use cases, including for surveillance, prevention, diagnostics, therapeutics, follow-up, contact tracing, communication and community engagement (see Annex 1). Such applications are summarized in a 2022 inter-agency survey on health innovations in response to the COVID-19 pandemic *(14)* and emphasized in a 2021 editorial in the Eastern Mediterranean Health Journal *(15)*. Examples include: telemedicine, the use of which was reported by many Member States of the Region (especially in the private sector) and includes online consultations, referrals to diagnostics and inpatient care, and management; mobile applications used for diagnosing and managing patients (the digital maternal and child health app e-MCH and the noncommunicable disease app e-NCD developed by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) and used in Jordan, Lebanon, Palestine and the Syrian Arab Republic); telehealth applications used for teaching, diagnosis, management and follow-up (used in Oman); digital contact tracing (used in Tunisia); digital inventories and registries for the home delivery of medicines, especially for noncommunicable diseases (used in the Islamic Republic of Iran, Qatar and Sudan). Such examples, however, reflect a limited use of the potential that digital health can provide for improving health systems *(16)*.

Challenges in implementation of the digital health agenda in the Region

16. The use of digital technologies in many countries, both regionally and globally, is hampered by concerns around data security and privacy as well as the potential risks to health systems and individuals, especially when almost half of the countries/territories in the Region are experiencing social conflict and/or emergency situations.

17. Digital health governance in most countries of the Region is either weak or fragmented, facing a lack of national roadmaps for action, ownership, investment plans, digital architecture and policies. Establishing national digital architecture plans and using standards to achieve interoperability of systems are further challenges *(17)*. Lack of knowledge and skills as well as weak strategic planning are limiting the impact of digital health investments on individuals' health and on the quality of service they receive *(18).* Weak digital health governance might be also due to a lack of compliance and enforcement mechanisms and the absence of best practice examples. Engagement of the public in policy

development, monitoring and accountability is also lacking, leaving citizens without protection with respect to privacy and confidentiality.

18. National capacities to manage digital health are inadequate in most countries. Many trained personnel have built their expertise on the job without formal instruction or have received education and training outside the Region, which may limit their ability to implement solutions appropriate to their country and cultural context. Public–private partnerships are weak in many countries, leaving the public sector isolated while the private sector, unsupervised, is predominantly the sole implementer, causing further fragmentation of projects. For example, telehealth is usually led by the private sector or academia, while the required legislation and regulating policies are lagging in most countries of the Region.

19. Language barriers are also a challenge. Monolingualism and the dominance of one language in the development, accessibility and utilization of digital health applications (for example, Arabic, English, Farsi or French) reduces their usability for speakers of other languages. In order for digital health applications to be most effective, they need to take differences in socioeconomic factors, language, disability and digital literacy into account.

20. Recently, those countries of the Region with greater digital health capabilities and facilities including virtual hospitals and centres (for example, Egypt, Pakistan, Saudi Arabia) have been attempting to assist lower-resourced nations with telemedicine and intensive care services. These usually involve interfacility agreements or are focused on certain areas of care that may not be available in low-resource settings.

Regional strategy and action plan for fostering digital health (2023–2027)

21. Adopting a regional strategy and action plan would pave the way for national digital health strategies that include specific action plans linked to national health and public health priorities, commensurate with available resources and infrastructure, allowing for better accessibility, affordability, quality, equity, safety and security of health care systems and services *(19)*.

22. Regional and national health strategies should adopt a comprehensive approach towards the implementation of digital health. Strategies should include: improving connectivity and access to health information at different levels of the health system to enhance integrated health care delivery; providing opportunities for telemedicine and remote health care services, especially for remote and hard-to-reach areas and target groups; streamlining, expanding and standardizing mHealth and eHealth services for health promotion, prevention, and provision of treatment and palliative care; enabling effective primary-care-oriented referral systems between different levels of the health system; considering the use of more technically advanced opportunities such as artificial intelligence and robotics; and, creating links with national health information strategies, especially in support of electronic medical and health records.

23. Digital health strategies should take into account a complex and interlinked set of objectives, which include:

- strengthening access to health services that are not otherwise easy to provide via traditional health systems (for example, extended health promotion agenda, personalized care);
- improving access to services for hard-to-reach populations (marginalized groups and people in remote areas);
- establishing a robust governance system for digital health to enable the sustainable, cross-cutting and scalable implementation of digital health services;
- documenting a vision for a national digital health architecture to govern national digital health applications and services, and establishing an investment roadmap to address gaps in the digital health ecosystem;

- reducing inequities in the utilization and quality of health care through hospital linkages (between deprived areas and well-resourced hospitals, and potential intercountry collaboration);
- improving access to health services at times when movement is restricted or contact with others should be avoided for infection control (building on the COVID-19 pandemic experience);
- establishing plans to address gaps in human resource competencies/capacities to plan, develop, manage, implement and use digital health applications and services;
- harmonizing services (through better linkages) and enhancing referral systems (through the use of eConsult platforms) to support the continuity of care across health facilities and providers;
- improving the availability, quality and consistency of data and ensuring system interoperability at all levels in support of national goals (for example, establishing electronic health records);
- ensuring ethical and regulated implementation of digital health and knowledge transfer ;
- increasing opportunities for the use of big data in artificial intelligence, fraud detection and quality improvement; and
- establishing sustainable financing approaches including appropriate provider reimbursement mechanisms, in line with national health policies and strategies.

Proposed guiding principles

24. The proposed guiding principles for digital health strategies are:

- attain universal health coverage and health for all by all;
- respond to regional and national health priorities;
- develop sustainable financing mechanisms;
- monitor the digital health maturity level at regional and national levels;
- ensure digital health is an integral part of national efforts towards digital transformation, informed by data, technical best practices and guidelines;
- involve all digital health stakeholders in the development of national digital health strategies, architecture and action plans to ensure ownership, dissemination and implementation; and
- recognize the urgent need to address the major barriers to implementing digital health technologies faced by low- and lower middle-income countries and those in crisis.

Vision and strategic objectives

25. The vision of the regional digital health strategy is to improve health outcomes in the Eastern Mediterranean Region by developing and promoting digital health infrastructures and solutions, which are linked to and supportive of health and public health priorities and resources of Member States. Digital health applications and services should be accessible, standards-based, affordable, scalable, sustainable, people-centred and based on country needs assessments.

26. The **first strategic objective** is strengthening digital health governance, norms and standards at regional, national and subnational levels (as applicable to each country).

27. A multisectoral national governance structure for digital health that identifies strategic goals, establishes digital health policies and ensures commitment to regional and global regulatory mandates is required. Training, recruitment and retention of the required human resources at different levels (government agency, department or national working group on digital health and industry) and adequate, sustainable budgets and resources are key. The governance structure should focus on resources, collaborations, data requirements, interoperability standards, ethics and regulations, legislative context, standardization of processes and linkages, and should address the identified challenges as well as include implementation and evaluation approaches *(20)*. As noted previously, tasks also include the development and adoption of specifications, policies and standards, and supporting an assessment and accreditation agenda for digital applications and services that aim to support health care delivery, data exchange or collection processes (Table 3).

28. The **second strategic objective** is advocating for digital health systems and networks that are people-centred, based on regional and national analysis, and supported and enabled by digital technologies, services and applications. This objective also aims to identify interventions to improve digital health literacy among the general population and health care providers, and to bridge the digital divide in communities of the Region *(21)*. These approaches should note the need for equitable access to services and opportunities, as well as enabling interventions to improve access to hard-to-reach areas and target groups (Table 3).

29. The **third strategic objective** is advancing the development, implementation and evaluation of national digital health strategies, consistent with digital health maturity and linked to advancing national capacities and digital health literacy.

30. A digital health strategy must be a core part of the broader national health strategy and priorities, to help to ensure that it is successful and that all health care strategies are interlinked and mutually supportive. Health system strengthening programmes should be informed by the needs for digital health capacity. These needs are not limited to hardware or internet provision; rather, a systems approach will link specific digital health applications to user needs and demands, and aim to reinforce the provision of efficient and quality care. Key stakeholders should be engaged in developing the national digital health strategy and its implementation plans, with clear and adequately defined roles for various institutions. Stakeholders include the public sector (health, telecommunication, science and technology, digital economy, and so on), the private sector, academia, nongovernmental and civil society organizations, bilateral agencies such as development banks, WHO and other health-related United Nations agencies (especially the ITU, the United Nations Children's Fund (UNICEF) and the United Nations Global Pulse initiative) and the public (users, patients and relevant population groups). Moreover, clear criteria and plans should be in place for monitoring and evaluating implementation of the digital health strategy (Table 3).

31. The **fourth strategic objective** is promoting regional and national stakeholder collaboration towards advancing digital transformation, knowledge translation and innovation.

32. Many countries do not have enough university-level programmes related to digital health and health informatics for training qualified digital health workers. Similarly, the recruitment and retention of such professionals may be challenging. Programmes should also include continuous education for health professionals in the areas of digital health and innovation to ensure that wider capacity for programmes is in place. Multistakeholder partnerships and protocols for cooperation between the health sector and other sectors involved in digital health implementation are also key (Table 3).

Table 3. Summary of strategic objectives and proposed activities

Strategic objective	Proposed activities
Strengthening digital health governance, norms and standards at regional, national and subnational levels	Assessment of country priorities with respect to digital health, as well as existent norms, standards, systems, infrastructure and policies
	Supporting evidence generation, based on identified priorities, in support of digital health policy-making, and developing national digital health architecture, actions and investment plans
	Developing digital health governance mechanisms, including legislative and ethical frameworks, as linked to countries' digital transformation situation, maturity, infrastructure, facilities, data security and resources (human, logistic, financial, and so on)
Advocating for digital health systems and networks that are people-centred, based on regional and national analysis, and supported and enabled by digital technologies, services and applications	Identifying gaps, priorities and resources needed for developing and sustaining digitally-enabled people-centred health systems
	Monitoring trends in digital technologies and applications that have good potential for supporting health systems and services
	Fostering the adoption of digital solutions that are consistent with WHO clinical, public health and data recommendations, including people-centred interoperability standards and technical specifications
	Supporting community-based models that support and advocate health promotion and prevention, rather than disease control and management only
	Conducting national situation analysis, and identifying related priorities

Strategic objective	Proposed activities
Advancing the development, implementation and evaluation of national digital health strategies, consistent with digital health maturity and linked to advancing national capacities and digital health literacy	Drafting and disseminating national strategies and action plans with roadmaps Identification and inventory of national activities, digital applications and services, and projects Development of national digital health architecture blueprint, investment roadmaps, performance indicators and maturity level assessment
Promoting regional and national stakeholder collaboration towards advancing digital transformation, knowledge translation and innovation	Identification of national/international stakeholders and academic partners Building the necessary infrastructure for intersectoral collaboration and dialogue, collaborative activities (communities of practice, exchange of good practices and lessons learned, policy briefs, and so on) Developing and sharing digital health literacy and awareness building programmes Defining priority needs and fostering digital health innovations, as linked to available resources, with special emphasis on modern applications (including robotics, artificial intelligence, management of big data, and so on).

Recommendations for Member States and for the Secretariat

33. Member States are encouraged to**:**

- engage national stakeholders in developing and/or fostering digital health strategies and action plans with roadmaps;
- develop national digital health architecture and investment plans, allocate resources and encourage national investment in standards-based and interoperable digital health systems at both national and district levels;
- build national capacities in digital health and related innovations, as linked to country health and public health priorities;
- promote evidence generation and research projects in support of health policy-making on digital health; and
- request technical support for developing interoperable national digital health systems and prioritizing evidence-informed digital health applications that are consistent with clinical, data and public health recommendations.

34. WHO is requested to:

- avail necessary technical, research and logistical resources for the implementation of the regional strategy on digital health;
- support the development of national digital health action plans;
- coordinate missions to Member States and encourage the involvement of relevant United Nations agencies and stakeholders in digital health;
- report on progress made in implementing the strategy to the 71st and 73rd sessions of the Regional Committee; and
- present a final report on implementation of the regional strategy for fostering digital health in the Eastern Mediterranean (2023–2027) to the 75th session of the Regional Committee in 2028.

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Annex 1.

Examples of digital health applications in use in Member States of the Region (as of June 2022)

Country/territory	Application name	Type of application	Source
Bahrain	BeAware	—	—
Djibouti	DHIS-2	—	*(A1.1)*
Egypt	Eksheff	Online platform for telemedicine	*(A1.2)*
	Ain Shams	Virtual hospital	*(A1.3)*
	—	Vaccine administration management system	—
Iran (Islamic Republic of)	—	Vaccination registration system	*(A1.4)*
	—	Vaccine side effect registration system	*(A1.5)*
	—	Diagnostics	—
	—	Digital contact tracing	—
Iraq		Vaccine administration management system	*(A1.6)*
		Diagnostics	*(A1.7)*
Jordan	Edraak	Online training	*(A1.8)*
	Aman	Contact tracing	*(A1.8)*
	Sehtak	Public health information	*(A1.8)*
	Crader	Reporting of gatherings, contact tracing	*(A1.8)*
	Bader	Quarantine surveillance	*(A1.8)*
	e-MCH	Maternal and child health	*(A1.9)*
	e-NCD	Noncommunicable diseases	*(A1.9)*
Kuwait	Shlonik	Contact tracing	*(A1.10)*
	Vaxcert	Vaccine administration management system	*(A1.11)*
Lebanon	Century Tech	Online learning	—
	e-MCH	Maternal and child health	*(A1.9)*
	e-NCD	Noncommunicable diseases	*(A1.9)*
Morocco	Liqahcorona	Vaccine administration management system	—
	Wiqaytna	Contact tracing	*(A1.12)*
Oman	Tarassud	Contact tracing	*(A1.13)*
	AlEjaza	Online training	—
Pakistan	Open Smart Register Platform	Population health tracking for frontline health care workers	*(A1.14)*

Country/territory	Application name	Type of application	Source
Palestine	Weqaya	—	—
	DHIS-2		*(A1.1)*
	e-MCH	Maternal and child health	*(A1.9)*
	e-NCD	Noncommunicable diseases	*(A1.9)*
	Your Health	—	*(A1.15)*
Qatar	eJaza	Sick leave certification	*(A1.16)*
	Ehteraz	Traveller registration	*(A1.17)*
Saudi Arabia	e-Sehha	—	*(A1.18)*
	Sehhaty	—	*(A1.19)*
	Wasfaty	Medicine delivery	*(A1.20)*
	Mawid	Central appointment system	*(A1.21)*
	Tetamman	—	*(A1.22)*
	Tawakkalna	—	*(A1.23)*
	Tabaud	—	*(A1.24)*
Somalia	DHIS-2	—	*(A1.1)*
	—	Solar powered oxygen	*(A1.25)*
Sudan	4949-NCD health services	—	—
Syrian Arab Republic	e-MCH	Maternal and child health	*(A1.9)*
	e-NCD	Noncommunicable diseases	*(A1.9)*
Tunisia	Ehme	—	—
	P-Guard Robot	Surveillance robot	*(A1.26)*
United Arab Emirates	Alhosn	Test results, vaccination certificate	*(A1.27)*
	Manassa-eldoctor-eleftrady	—	—
	StayHome	Quarantine surveillance	*(A1.28)*
	COVID19-DXB	Information	*(A1.29)*
	—	Robots	—
	—	Smart helmet technology	—

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