REPORT

Mapping Digital Technologies in Health Used by MMS Members

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Content

Executive Summary

This report reveals the results of the mapping exercise undertaken by MMS of its members' use of digital technologies in health. The aim of the survey was to assess the knowledge and use of digital health technologies and to facilitate and foster collaboration between MMS member organisations. In short, it was designed to obtain a better understanding of who is doing what, how and where.

The survey was conducted in two parts, beginning with an online questionnaire which was then followed by a telephone interview. Of the 47 organisations contacted, 20 responded of which 13 are engaged in digital health. This mapping exercise does not claim to give a representative picture of the use of digital health interventions within the MMS network. It does, however, provide a detailed look at where half the members currently stand and the kinds of issues they are facing when it comes to digital health.

The degree to which digital technologies are being used ranges from zero engagement to "a little bit" right up to "exclusively digital health". Most of the organisations identify the role played by digital health as "small" with regards to their overall portfolio of activities. This finding is cause for concern and a long way from the idea of digital health being a solution to Universal Health Coverage (UHC) as envisioned in the third global survey on eHealth among WHO member states (WHO, 2016; Broadband Commission, 2018). With UHC firmly on the international health agenda, the low engagement of MMS members with digital health may indicate a lack of alignment in Swiss NGOs with the future of international health cooperation. Harnessing the power of digital technologies is contributing essentially if the Sustainable Development Goals are to be achieved.

The respondents to the survey showed that they understand the advantages in the use of digital technologies, such as better data quality and greater efficiency and effectiveness in data collection and clinical practices. Nonetheless, there appears to be a lot of uncertainty about how to use and engage with these technologies. A large number of challenges, such as data ownership, security, lack of governmental engagement and understanding, difficulties in multi-sectorial collaboration, lack of network availability and insufficient in-country training are preventing the MMS member organisations from engaging with digital health in a more progressive way.

Another key finding of this research, however, is the willingness of MMS members to 'go digital', something which also appears to be true of their donors.

The survey reveals there are several topics, which are being rather neglected during the development or implementation phase of digital health. These include waste management, inclusion of people with disabilities and issues around gender.

Overall, the survey reveals that both knowledge and competence could be better capitalised on within Switzerland's international health cooperation. As the use of digital health has gained further momentum during the corona crisis, it makes sense to increase awareness and empower more MMS member organisations in the responsible use of digital technologies.

In conclusion, the Medicus Mundi Switzerland network recognises the necessity of supporting our members to take ethical and wise decisions concerning the implementation of adequate technologies in order to avoid the further weakening of already weak health systems.

1. Background

Digitalisation affects us all and we are, perhaps inevitably, moving towards a digital future. Ubiquitous computing and ever-growing connectivity are starting to link even those populations which have been historically marginalised (Castells, 2000). However, the successful exploitation of opportunities brought about by digitalisation is paralleled by reports of human rights abuses (Alston, 2019), injustices and unintended consequences.

The speed and scale of changes are increasing – which means the agility, responsiveness and scope of cooperation and governance mechanisms must also be assessed and adjusted. A poorly thought-out implementation of digital health technologies has the potential to deepen power imbalances and inequalities in health, especially within countries and between low and high-income countries. Furthermore, a lack of education, as well as inherent biases and sociocultural norms, are curtailing the ability of women and girls to benefit from the opportunities offered by the ongoing digital transformation (OECD, 2018). Digital health technologies require sound research and development; we need to gain an in-depth understanding of their impact on public health and on the health systems where they are applied (WHO, 2016).

Digital technologies can lead to the further fragmentation and complexity of already weak health systems by, for example, flooding them with a multitude of gadgets that are neither coordinated nor adapted to local conditions and cultures (WHO, 2019a). Digital solutions might not necessarily meet the needs of their recipients, whether they be individual patients, communities or health workers. Without fair and ethical political guidance and effective global and national regulations, the introduction of digital technologies can facilitate the transmission of health-related data irrespective of national borders and societal hierarchies. As a result, inequities within and between countries can persist and may even rise.

Discussing topics such as the availability of infrastructure, data ownership, data hosting, and ethical questions regarding data hosting and data extraction, is of crucial importance to ensure that digital technologies are of maximum benefit to the health of everyone.

1.1 Rationale

With the rapid dissemination of digital technologies in health, the work of Swiss organisations active in the field of international health cooperation is changing. Some of the 47 Medicus Mundi Switzerland member organisations have adopted digital technologies across the board; others are using selected digital components in specific health programmes with varied degrees of involvement; still others have not yet engaged with digital health.

MMS intends to advise, facilitate and foster collaboration among its member organisations in the use and analysis of digital technologies in health by taking a series of measures.

The secretariat of Medicus Mundi Switzerland has dedicated 2020 to the topic of health in a digital age. To this end, MMS has developed a framework called: *Digital Health in International Cooperation. A Transnational Framework*. Furthermore, MMS is mapping its members' use of digital technologies in health and convening forums to present information about digital health technologies and their consequences. It is also organising the MMS 2020 Symposium around this topic.

2. Methodology

2.1 Goals and Outcomes of the Mapping Exercise

> Medicus Mundi Switzerland is facilitating and fostering collaboration between its member organisations by mapping the various digital technologies in health that these members are using and implementing.

The mapping of digital technologies for health being used by MMS member organisations is designed to obtain a better understanding of who is doing what, how and where.

The methods used in this mapping exercise are:

a) a quantitative survey sent to all MMS members;
b) a qualitative study via short telephone interviews to gain more insight into the specific uses of health technologies (only for those members who have used or are currently using digital technologies for health).

Every member organisation of Medicus Mundi Switzerland was contacted. Telephone interviews were only conducted with those organisations that have employed or are currently employing digital technologies in health who took part in the online survey. The questionnaire for the quantitative survey and the telephone interview questions can be found in Annexes 1 and 2. The list of participants can be found in Annex 3.

Survey Monkey software was used to collect the responses of the quantitative survey. The analysis includes simple frequency tables. The interviews of the qualitative study were transcribed and analysed accordingly.

For this mapping exercise, we used the following definition of digital health:

Definition of Digital Health

For the purposes of this survey, the term 'digital health' refers to the use of digital technologies in health and financing within the broad aim of strengthening health systems and outcomes (WHO, 2004). 'Digital health' is defined as the use of digital, mobile or wireless technologies to support the achievement of health objectives. It denotes the general use of information and communication technologies (ICT) for health and includes both mHealth and eHealth.

Digital health interventions can comprise a range of **technologies** including artificial intelligence (AI) and machine learning; telemedicine; computational medicine; biomedical analytics; healthcare systems engineering; data management; clinical engineering; wearable technology; biomedical sensors and processing; health economics; digital therapeutics. Digital health involves an array of **activities**, for instance, in the design, implementation and operation of national health information platforms, the provision of mobile applications for data gathering, the use of short messaging services, interactive voice response and health management information systems, digital literacy training, big data analytics and even the deployment of drones (WHO, 2016).

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3. Results

3.1 Online Survey Results

The online survey was sent to all MMS members on 3 March 2020 with a follow-up email on 26 March 2020. Of the 47 member organisations, 20 participated (a list of the participants can be found in Annex 3).

The table below illustrates the organisations, which indicated that they have digital projects, programmes currently in place or are using digital tools (Table 1), comprising 13 organisations in total. Seven organisations reported that they are not using digital health technologies for reasons including the size of the organisation, the purpose of its mandate (e.g. grassroots activities or the organisation is not an implementer), funding constraints, lack of opportunities, scarcity of internet or a lack of other resources.

Table 1. Organisations that have digital interventions in place

Organisation	Number of project sites	Countries
Swiss TPH (SCIH- HTTU)	15	Afghanistan, Albania, Cameroon, Chad, Ethiopia, India, Romania, Senegal, Switzerland, Tajikistan, Tanzania, Ukraine, Nigeria, Rwanda, Somalia
Swiss Red Cross	7	Bangladesh, Belarus, Guinea, Lao PDR, Nepal, Pakistan, Togo
Novartis Foundation	6	Brazil, Mongolia, Rwanda, Senegal, South Africa, Vietnam
ISPM, University of Bern	6	Lesotho, Malawi, Mozambique, South Africa, Zambia, Zimbabwe
terre des hommes schweiz	5	Mozambique, Nicaragua, South Africa, Tanzania, Zimbabwe
Terre des hommes foundation	4	Burkina Faso, Mali, Nepal, Niger
SolidarMed	3	Lesotho, Mozambique, Zimbabwe
Mission 21	3	Cameroon, DRC, Tanzania
FAIRMED	2	India, Sri Lanka
CBM Schweiz	2	Bolivia, Pakistan
SUPPORT	1	Nigeria
Enfants du Monde	1	Burkina Faso
Calcutta Project Basel	1	India

PART 1 – questions relating to the context of where and how respondents use digital technologies

The following Chart 1 shows the areas in which respondents are using digital health technologies. Of the 13 organisations in total, nine are using digital health technologies in health data management, followed by health service delivery (n=8), capacity building in human resources for health (n=6) and health research (n=6).

Chart 1. Where digital health technologies are being used
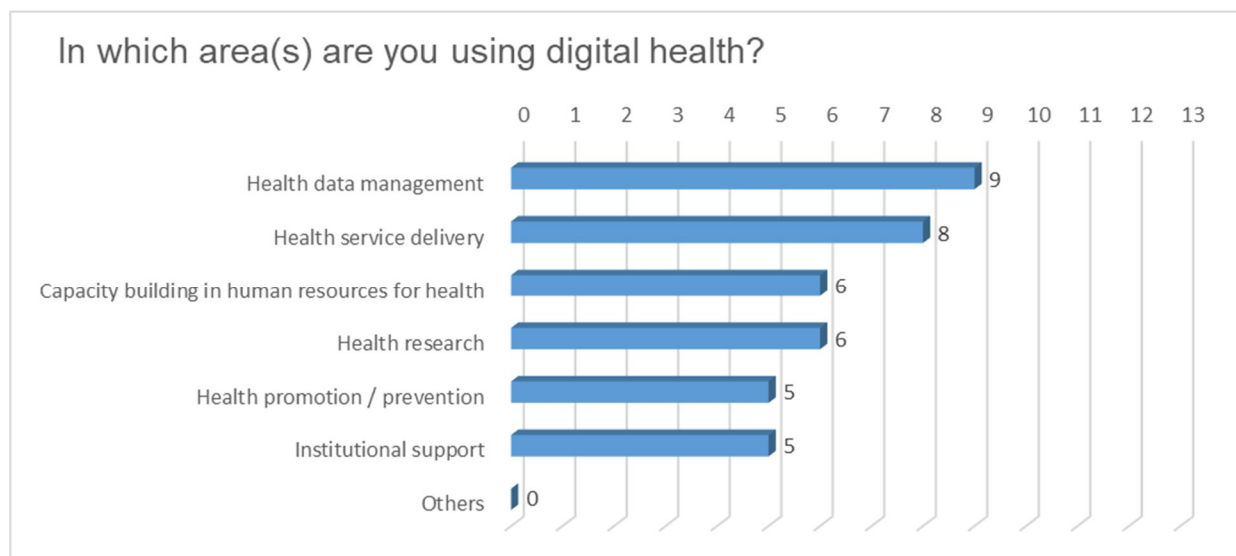
Note: n=13; multiple answers possible

Chart 2 illustrates the manifold ways in which digital health technologies can be employed. This list is derived from the classification of digital health interventions (DHIs) and how digital and mobile technologies are being used to support health system needs (WHO, 2018). Six organisations reported that they are using digital health technologies for learning and training systems, followed by client communications systems, including transmitting health event alerts, information or reminders (n=4), health management information systems (n=4), public health and disease surveillance systems (n=4), research information systems (n=4) and telemedicine (n=4). None of the organisations reported activities in the areas of *emergency response systems*, *environmental monitoring systems* or *identification registries and directories*.

Chart 2. *Purpose(s) for the use of digital technologies in health*

For which purpose(s) are you using digital technologies in health?
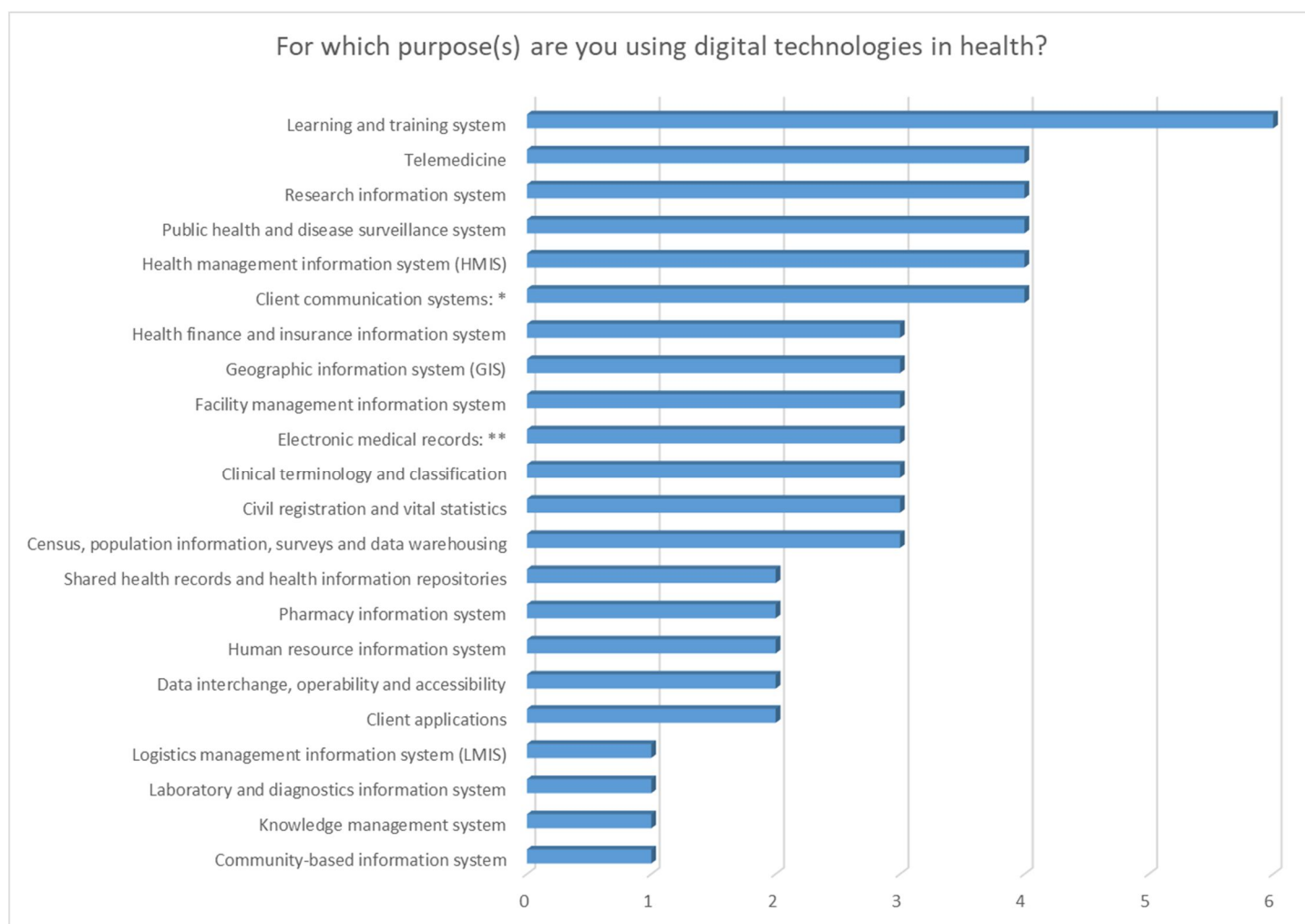
*Notes: * Client communication systems: e.g. transmitting health event alerts, information or reminders;*
*** Electronic medical records: for clients to access their own medical records, or for self-monitoring or the tracking of health or diagnostic data; client identification or registration, referral coordination;*
**** Others / Difficult to categorise: e.g. artificial intelligence (AI)*
Not included: Emergency response systems (n=0), Environmental monitoring systems (n=0), Identification registries and directories (n=0)
n=13; multiple answers possible

The following Chart 3 illustrates the programme areas in which the participants are using digital health tools. Nearly half the respondents revealed that they are using digital health technologies in maternal, neonatal and child health (n=6), followed by primary healthcare (n=5) and other areas such as neglected tropical diseases (NTDs); software: procurement tools for medicine; eye health and blood safety.

Chart 3. Programme areas for digital health technologies
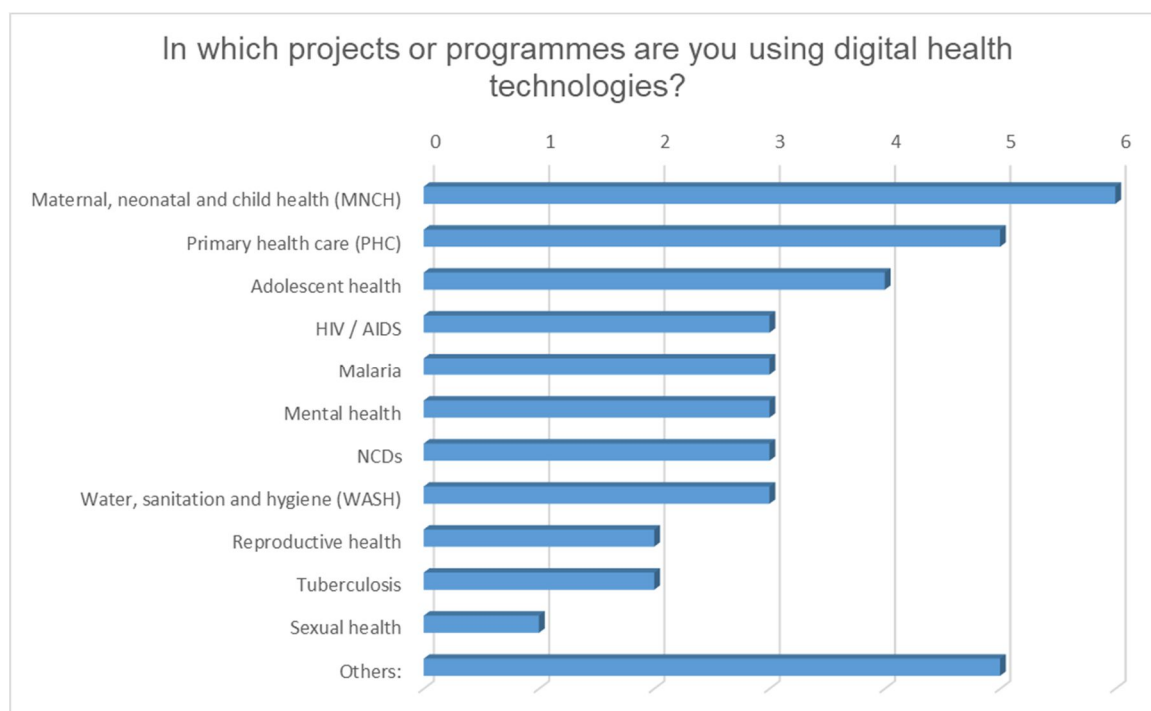
Note: n=13; multiple answers possible

Chart 4 reveals the organisations' level of interaction with the existing health systems. Nine organisations indicated that they are working in rural areas, with others working in urban areas (n=8) and at a national level (n=7).

Chart 4. Health system level
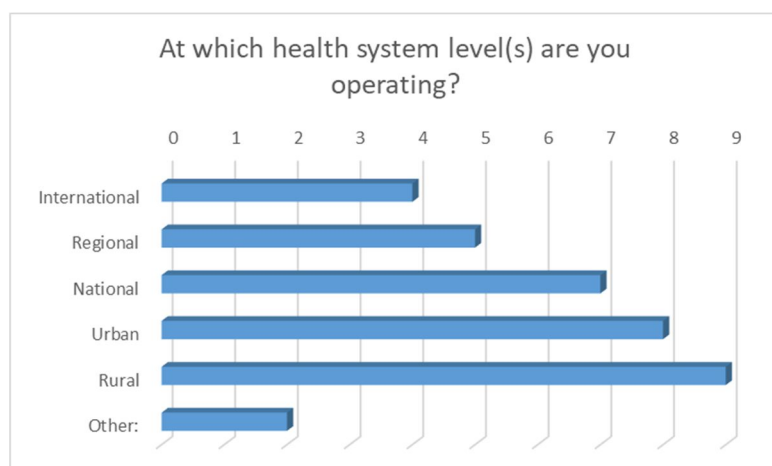
Note: n=13; multiple answers possible

With regards to the *status of the digital health project or programme*, half the respondents stated that they have established programmes (n=7) or programmes in the pilot phase (n=7). Four organisations indicated that they are running digital interventions on an informal basis, meaning that they are in the early adoption phase (multiple answers were possible).

The participants were asked to rate the status of their *portfolio of digital health activities* with regards to their overall activities. Eight of the 13 organisations using digital health reported that

such activities make up only a small percentage of their overall portfolio, whereas two organisations reported that their activities are exclusively in digital health.

The participants were asked to state how many people or beneficiaries they are reaching via their digital tools. The number of beneficiaries reached varied between organisations. Half the respondents indicated that they are reaching over 1,000 while others reach fewer.

Chart 5 and Table 1 show the number of project sites per organisation. The respondents are implementing projects across the globe, with activities in South America, Africa, Eastern Europe and Asia.

Chart 5. Countries where digital health activities are being implemented

PART 2 – How digital technologies are being used

The following Chart 6 illustrates the types of devices or hardware which the respondents are using. The majority of respondents indicated the use of Google Android mobile phones (n=11), computers (n=7) and Google Android tablets (n=6).

Chart 6. *Types of devices or hardware being used*
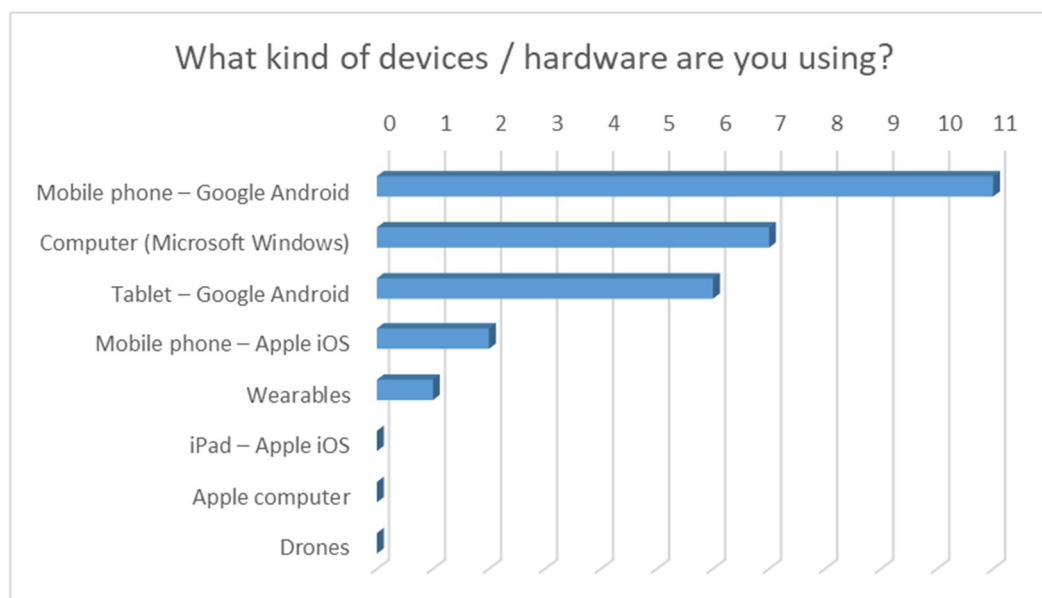
Note: n=13; multiple answers possible

The respondents were asked to state what *kinds of applications or software* they are using. Nine organisations indicated that they are using free, open-source software; five indicated proprietary software with licenses. Of the 13 organisations employing digital technology, eight reported hiring an expert from outside the country of deployment; five employed an expert from within the country and three developed the required software within their own organisation.

We asked the participants to state honestly to what extent they considered various different aspects when designing the digital health tool, project or programme Table 2.

Two thirds of the respondents stated that they gave a large amount of consideration to the environment (e.g. electricity use, equipment availability). However, hardly any organisation gave consideration to a waste management system (75%). When it came to considering the integral effects on health systems with direct or indirect consequences, all the organisations revealed that they had thought about this aspect at least a little. When asked whether they had considered the availability of non-digital options, nearly two-thirds responded that they had thought about it a great deal, as well as giving consideration to the digital skills of the recipients (75%). Ethics and data ownership were strongly considered by 58.3% and 66.7% of the respondents respectively. If a national digital health strategy was in place in the country of implementation, nearly two thirds of respondents had considered aligning their project to this strategy (58.3%). Six organisations reported that they had co-designed their tool or programme with their intended users at least a little but respondents were less likely to have conducted a participatory evaluation. With regards to gender sensitivity, the majority of respondents considered it a little (50%) or not at all (33.3%); with regards to people with disabilities (blind, deaf, physical impairments), there was little consideration given (25%) or none at all (66.7%).

However, two thirds of organisations had given a high degree of consideration to designing a tool which is culturally sensitive (66.7%) and respects privacy policy (58.3%).

Table 2.Aspects considered when planning and developing a digital health tool

	Very much (%)	A little (%)	Not at all (%)
The environment (electricity use, equipment availability)	66.7	25.0	8.3
Waste management systems (eWaste)	0.0	25.0	75.0
Integral effects on health systems (direct and indirect consequences)	50.0	41.7	0.0**
Availability of non-digital options	58.3	33.3	8.3
Digital skills of the recipients	75.0	16.7	8.3
Ethics	58.3	25.0	16.7
Data ownership	66.7	25.0	0.0**
Alignment with the national digital health strategy (if one exists)	58.3	25.0	16.7
Co-development of systems by their intended users	25.0	25.0	50.0
Evaluation in participatory codes of behaviour	8.3	33.3	50.0**
People with disabilities (blind, deaf, physical impairments)	8.3	25.0	66.7
Gender sensitivity	16.7	50.0	33.3
Cultural sensitivity	66.7	25.0	8.3
Privacy policy (e.g. right to use images)	58.3	33.3	8.3

*N=12; **missing data*

PART 3 – Questions relating to governance and leadership

Part 3 of the questionnaire comprised a series of questions with yes/no answers concerning governance and leadership. Table 3 below summarises these answers with regards to the extent to which the organisations are working in alignment with national strategies, a Memorandum of Understanding (MoU) with the implementing countries, and policies and structures to ensure good governance and leadership. The results are mixed, with half the respondents stating that they do not know whether the country of implementation has a digital health strategy. Less than half the respondents reported having a digital health policy in place and a unit or team dedicated to digitalisation. A little more than half stated that they have a privacy policy.

Half of the respondents have a MoU signed with the implementing country.

Table 3.Summary of questions relating to governance and leadership

	Yes (%)	No (%)	Don't know (%)
Does your organisation have a Memorandum of Understanding with the government(s) of the beneficiaries in the respective country / countries, which regulates data ownership?	41.7	33.3	16.7**
Does the country in which you are implementing digital health have a digital health strategy?	33.3	8.3	50.0**
Does your organisation have a digital health strategy or a strategy that includes digital issues?	41.7	50.0	8.3
Do you have a dedicated unit / team within your organisation that is in charge of digital health or digitalisation?	41.7	50.0	0.0**
Does your organisation have any policies in place with regards to data security?	41.7	25.0	25.0**
Does your organisation have any policies in place with regards to privacy?	58.3	8.3	25.0**
Does your organisation provide ongoing training in the use of digital technologies at its headquarters or onsite?	50.0	41.7	0.0**

*N=12; **missing data*

PART 4 – Experiences and lessons learnt

To conclude the survey, participants were asked two open-ended questions.

a) What do you see as the advantages of using digital technologies in health for your organisation?

The respondents identified better data quality and availability of data as one of the key advantages of using digital tools for health. Technology can make primary healthcare more efficient and can support weak health systems to perform more effectively, which leads to a better performance of programmes and projects overall. Hard-to-reach populations or those living in conflict-affected areas can now be accessed via new technologies. There is the opportunity to obtain real-time monitoring data, which can be used to improve responses and the quality of care. An increased credibility of health providers among clients has also been observed due to more accurate diagnosis and treatment plans. Overall, digital health was found to enhance the efficiency of clinical, learning or managerial processes.

b) What do you see as the challenges of using digital technologies in health for your organisation?

The most common challenges mentioned were data ownership, ethical considerations, and network problems and availability in the population. Respondents noted the need for a sound assessment to be undertaken to discover whether an intended digital solution is appropriate for a given environment and will be sustainable. Capacity building was also identified as potentially posing a challenge since the educational level in the various implementing countries varies. A new tool will not necessarily solve a health problem in a certain area. Some organisations raised the necessity of carefully assessing the local situation to see whether a digital solution really supports the decision-making process and health outcomes. Digital tools should not replace the human assessment and decision-making process. They cannot replace personal skills or individual contact. Respondents observed that feeding data back into existing health management systems can also be challenging.

c) Sustainability of digital health interventions

As a final question, participants were asked to rate (on a scale of 0 to 10) how sustainable they believe their organisation's approach to digital health actually is. The average result came out as five.

3.2 Results of the Telephone Interviews

MMS conducted short telephone interviews to gain further insight into the specific use of health technologies in those organisations, which had indicated in the survey that they had used or are currently using digital technologies for health. A total of twelve interviews were conducted and responses to five questions were collected. Each interview was transcribed to facilitate the analysis.

Q1. Why do you use digital health technologies? What significance do they have for your organisation?

The degree of significance varies from being very significant in some organisations to having a low significance or the organisation only being in the early stages of using digital health technologies. Digital health tools were identified as being an efficient way to reach out to a large number of people in a specific situation within a short time frame. For some organisations, digital health is a tool rather than a strategy and they stressed the importance of distinguishing between tools and systems.

Q2. How do you resource your projects in digital health?

The funding situation varies between the different organisations depending on their core funding process and their level of engagement in using digital technologies in health. Some organisations stated that they have annual budgets for digital health; others have no specific budget but still manage to include digital health in their programmes; a third group uses multiple sources to manage their programmes. One organisation mentioned that they find it difficult to raise funds for digital health projects not because of a lack of money available but due to the challenge of selling such projects to donors. They revealed there is a choice between either developing a specific tool or stating that digitalisation is part of the organisation's working method using a bottom-up approach which may or may not lead to success. One organisation mentioned the issue of long-term investment and the funding of maintenance, broken equipment, purchasing spare parts, and etcetera. Respondents stated that it can be difficult to raise funding for tools or programmes that donors cannot 'see', e.g. software.

Q3. There can be various hindering factors and / or barriers when implementing digital health solutions. What are the most significant ones encountered by your organisation?

Data ownership, security and hosting: organisations identified a lot of unanswered questions concerning data ownership. Every country is different and has varying policies or none at all. This is resulting in a lack of clarity about the issues of data security and ownership, with the lack of policies also meaning it is unclear to whom a tool actually belongs.

Infrastructure: organisations mentioned issues around connectivity, electricity supply and access to wi-fi which is not guaranteed in all countries. They also observed that tablets and computers can get lost and that training in digital health is required.

Capacity: there are varying degrees of competencies in staff and beneficiaries in the implementing countries as well as within the organisations themselves. Respondents also mentioned the lack of imagination regarding the potential of digital health in healthcare and a

lack of partnership. Digital health necessitates a multiple stakeholder approach and this requires strong collaboration between different partners outside the health sector.

Collaboration: respondents identified the collaboration with governments as posing additional difficulties in the implementation of digital health, with some governments taking ownership while others do not. Not every tool is suited to the culture of each country and may need to be adapted. Some larger organisations or big companies like Google or Apple may 'invade' a country with their digital tool(s) while some may also have hidden agendas.

Do no harm: organisations stated the importance of having adequate systems in place since digital health cannot overcome the issue of accessing healthcare once a diagnosis has been given. It is debatable whether detecting cases in a given environment is beneficial if access to healthcare is not guaranteed. A robust referral system needs to be in place.

Inclusion concept: the respondents made it apparent that people with disabilities are often overlooked in the design and implementation of digital tools.

Q4. What could help your organisation to overcome some of these barriers?

Training: several organisations mentioned the need for more training and awareness-raising exercises regarding the potential of digital health and its use. Training should also enhance a flexible approach to using digital tools and the ability to think outside the box.

Clear policy structures: there is a need to enhance policy structures in order to improve the working conditions, safety and data ownership related to digital health. However, there are no clear answers as to who should plan, develop and pay for such policy structures.

Collaboration: there is a clear need for collaboration with different stakeholders, including those outside the health sector (e.g. universities, software specialists from other countries). Private-public partnerships are seen as a way forward.

Flexibility in funding: the 'traditional way' of funding is considered to be inadequate for digital health programmes because tools may still be in development and evidence of outcomes achieved by this type of medicine does not yet widely exist.

Q5. How do you view the rapid growth of digital health solutions? What is required to ensure that the introduction of digital health projects avoids harming already effective activities and health systems?

Collaboration: best practices should be shared among stakeholders to avoid duplications.

Creating a foundation of approaches to digital health would be very useful. For example, implementing a Digital Health Information System (DHIS) in each country would provide the groundwork for ministries and the general population which could then be built upon further.

The organisations recognised the introduction of digital health as an amazing opportunity to speed up the process towards *universal health coverage*.

There are many tools available that have been tested and re-invented but only a few projects are being conducted to their fullest potential. Too often, projects come to an end and this poses a problem.

4. Discussion

The survey intends to provide an indication of the use of digital health among MMS members and to facilitate exchange and learning opportunities.

Of the 47 organisations contacted, 20 responded to the survey of which 13 are already engaged in digital health. This mapping exercise does not claim to give a representative picture of the MMS network. It does, however, provide a detailed look at where half the members currently stand and the kinds of issues they are facing when it comes to digital health.

The degree of engagement varies

The degree to which digital technologies are being used by MMS members ranges from zero engagement to "a little bit" right up to "exclusively digital health". Most of the organisations identify the role played by digital health as "small" with regards to their overall portfolio of activities. This finding is cause for concern and a long way from the idea of digital health being a solution to Universal Health Coverage (UHC) as envisioned in the third global survey on eHealth among WHO member states (WHO, 2016; Broadband Commission, 2018). With UHC firmly on the international health agenda, the low engagement of MMS members with digital health may indicate a lack of alignment in Swiss NGOs with the future of international health cooperation. Harnessing the power of digital technologies is contributing essentially if the Sustainable Development Goals are to be achieved.

Knowledge about digital technologies is available within the network

The survey and telephone interviews showed that knowledge about digital health is available within the Medicus Mundi Switzerland network. Chart 2 shows the broad spectrum of purposes for which the respondents are using digital technologies.

MMS members are using digital technologies mainly in the areas of health data management, research, health service delivery and capacity building, and chiefly for the purposes of learning and training, telemedicine, surveillance systems, health management information systems and for client communication. The majority of digital health interventions are being implemented in maternal, neonatal and child healthcare projects, followed by primary healthcare projects and adolescent health. Women, children and adolescents in middle and low-income countries require more accessible and affordable quality care, yet these population groups remain less likely to benefit from digital innovations (OECD, 2018; Lee & Pollitzer, 2016) because of a lack of resources, infrastructure and education or due to their socio-economic status. During the interviews, several respondents stated, for example, that tools used to identify pregnant women requiring antenatal care and for newborns with visual impairments could not guarantee quality healthcare if the referral systems are not in place. In these discussions, the 'do-no-harm' concept was mentioned several times.

Overall, the knowledge and competence within individual organisations could be better capitalised on within Switzerland's international health cooperation. As the use of digital health has gained further momentum during the corona crisis, it makes sense to increase awareness and empower more MMS member organisations in the responsible use of digital technologies.

There is little evidence of the use of local or national resources

The member organisations are implementing projects across the globe with activities in South America, Africa, Eastern Europe and Asia. The preferred digital interface used in these projects

is the mobile phone, using solely US-originating operating systems. Free and open-source software is widely used.

There is little evidence of the use of local or national resources in the research and development or in the design, building, implementation and maintenance of digital health in the countries of deployment. There is growing criticism that the use of eHealth is not being effectively aligned with local realities (van Stam, 2020). Most organisations deploy expat personnel to guide their digital health activities, and some are developing the required software in Switzerland and other European countries. Over the long term, less than half the respondents have formal liaisons – in the form of MoUs – or know about the national stipulations and policies in-country intended to guide their work in digital health. This, combined with a focus on 'data management', carries the risk that Swiss NGOs will extract data from the countries into Switzerland. The ethics of such data extraction possibly framed as a key advantage of 'better data quality and availability', is, in the very least, questionable and could become a source of future conflict in international health cooperation. This issue is well recognised by MMS members who have stated that "feeding data back into existing health management systems can be challenging".

Furthermore, the findings from the survey indicate a fragmented approach. Digital health is seen as more of a toolbox than a strategic approach to strengthen health systems.

The use of digital health is still 'emerging'

Half the respondents stated that they have programmes in the 'pilot phase' or an 'informal status', although some programmes are in an 'established status'. Seven organisations reported that they have not embarked on using digital health because of their size, purpose of their mandate (e.g. grassroots activities or not being an implementer), funding constraints, lack of opportunities, scarcity of internet or a lack of other resources. The fact that only a small number of organisations participated in the survey may also indicate that the use of digital health is still emerging among MMS members. This result suggests a need for further support and learning opportunities on the wide-ranging possibilities of using digital health technologies in a responsible way. The MMS Symposium 2020 will provide such an opportunity.

An enthusiasm for digital health has also led to a proliferation of short-lived implementations and an overwhelming diversity of digital tools, with a limited understanding of their impact on health systems and on people's well-being. WHO has issued several guidance documents on how to assess the quality and impact of digital health interventions in order to improve the status of evidence in this field (see WHO, 2016). At the same time, we need to recognise the innovative role that digital technologies can play in strengthening health systems and, hence, contributing to UHC.

In many places, health interventions incorporating mHealth (i.e. mobile digital wireless technologies for health) are largely for pilot projects or small-scale implementations, many of which have focused on establishing the evidence of feasibility and effect without extensive exploration of the infrastructure required to scale up and sustain the mHealth product (Labrique, 2013). mHealth is an appropriate way to address many of the health system constraints that are currently inhibiting services for reproductive, maternal, newborn and child health (RMNCH) in low and middle-income countries (WHO, 2015). However, there is still a limited understanding of what may be required to translate these projects into larger-scale deployments that can be sustained over the long term.

Digital health is considered as promising and important

The survey respondents realise the advantages to the use of digital technologies, such as better data quality, greater efficiency and effectiveness either in data collection or clinical practices. With digital technologies, real-time monitoring is possible and decision-making processes are faster and often more data driven. An increased credibility of health providers among clients has also been observed.

Nonetheless, there are many uncertainties about how to use and engage with digital technologies. Too many challenges are preventing MMS members from engaging with them in a more progressive way.

The results point to the complexity of digital health

The consultation exercise with our members revealed an uncertainty about how to use digital technologies safely and wisely, how to overcome the challenges of data ownership, security, lack of governmental engagement and understanding, difficulties in multi-sectorial collaboration, a lack of network availability and lack of training in-country. WHO and other stakeholders are especially urging member states in the global south to develop policies and clear guidance on how digital technologies should be used (WHO, 2019a; WHO, 2019b). However, on the international level, there is no consensus on how digital health interventions should fit into an overall digital health architecture. Digital health interventions imply that innovative public-private partnerships are needed and that collaborations with organisations outside the health sector are important.

Digital health has the potential to help address problems such as distance and access but still shares many of the underlying challenges faced by health-system interventions in general, including poor management, insufficient training, infrastructural limitations and poor access to equipment and supplies.

The readiness to 'go digital' is questionable

Another key finding of this research is the readiness of MMS members to 'go digital', and the same appears to be true of their donors. Although the organisations clearly display a comprehension of the strategic nature of digital health (for instance, by recognising the importance of health information management systems), there appear to be too many uncertainties and knowledge gaps concerning which digital health interventions best suit their needs. This appears to stem from uncertainties about how to approach donors – who, in turn, might have similar difficulties in appreciating digital health. Possibly, this uncertain interplay with donors is an important cause in the hesitation of MMS members to mainstream digital health.

The issue of going digital is far more complex than we might think

Another observation emerging from this research regards the issues that were <u>not</u> raised. As discussed in the introduction, digital health brings with it various philosophical and ethical issues. These include the agency of international partners, issues around globalisation and the emerging oligopolies (UNCTAD, 2019) that may indiscriminately commandeer data. The guidance provided by local communities, national, Southern governments, and international organisations like WHO and ITU, or even guidance from the Swiss government, were also not raised in the survey. Such issues were not explored due to the limited nature of the research, but their omission in the personal interviews shows there is much work to be done in making MMS members sensitive to the strategic importance of digitalisation, and to directing them

through the emerging literature and guidance on the subject. Such guidance could be required to reach the strategic parts of the policies and also to support the narrative of digital health inclusion in the various organisations so they can develop from the stage of 'early adoption' to 'maturity' in programme management and execution.

MMS will support its members in 'going digital'

The Medicus Mundi Switzerland network recognises the necessity of supporting our members in taking ethical and wise decisions concerning the implementation of digital technologies to avoid further weakening already weak health systems. The survey has revealed that there are several topics which are being rather neglected during the development or implementation phases, including waste management, inclusion of people with disabilities and issues around gender.

We produce about 50 million tonnes of eWaste per year and only 20 percent of this waste is being formally recycled (ITU, 2019). eWaste – which refers to used, broken or obsolete electrical and electronic equipment such as phones, laptops, sensors and TVs – can contain hazardous substances that may pose considerable environmental and health risks, especially if treated inadequately (ITU, 2018). eWaste is of particular concern in the world's least developed countries, while at the same time being capable of generating an enormous amount of money (economic returns are worth over 62.5 billion dollars per year) and employment opportunities (ITU, 2020).

If we want to reduce health inequalities, we need to challenge the idea that digital technology alone will improve health outcomes. Some people lack the skills to use digital health tools while others have the skills but do not have the motivation, confidence or access to use the tools for a number of complex reasons. Without inclusivity and accessibility, the gap between those who can benefit from the new technologies and those who are left behind will only increase.

The respondents wish for more training by Medicus Mundi Switzerland not only in practical terms but also in learning how to 'think outside the box'. There is a demand for a better policy landscape where MMS can support a greater amount of advocacy work. Digital health is shaping healthcare collaboration in new and different ways as many stakeholders are outside the health sector and need to be consulted. There is also a wish for more flexibility in terms of funding since many tools first need to be tested without clear knowledge of whether or not they will function. Donors are being equally challenged to think 'outside the box' when it comes to digital health financing.

4.1 Conclusions

Digital health is an emerging field. In line with the World Health Organization's recent work to develop classifications and recommendations for digital health interventions (WHO, 2018; 2019), this study reveals that Swiss organisations in international health cooperation are at the stage of 'dipping their toes in the water' when it comes to the new technologies. Although two MMS members are 'fully digital' in health, the responses from most of the participants show a hesitation in implementation and fragmented approaches and methods.

The survey results do, however, clearly show that digital health is already present within the MMS network. They also indicate the need for strategic and practical guidance and, therefore, justify the work that MMS and its partners have commenced in the development of a transnational framework on digital health in international health cooperation. The secretariat of Medicus Mundi Switzerland is committed to supporting its members in digital health.

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Annex 1 – Online Questionnaire

Digital Health Survey

We live in an era of increasing interdependence and accelerating change. Technological advances such as low-cost computing, the internet and mobile connectivity are changing landscapes, including in health. However, with a complex field of many actors, and with many new digital health interventions emerging, health systems are further threatened by fragmentation. Digital solutions might not necessarily meet the needs of the recipients, whether they are individual patients, communities or health workers.

The MMS secretariat is conducting a survey among its member organisations on their use of digital technologies in health to map their ongoing work in this area. We are particularly interested in finding out what is being done, and in drawing up an inventory of successes, challenges, lessons learnt and good practices. The results will be published in a report and presented at a MMS Digital Health Forum. The outputs will feed into the development of a Swiss digital health framework and a series of policy dialogues with key stakeholders in the field of digital health in Switzerland and abroad.

Definition of Digital Health

For the purposes of this survey, the term 'digital health' refers to the use of digital technologies in health and financing within the broad aim of strengthening health systems and outcomes.[1] 'Digital health' is defined as the use of digital, mobile or wireless technologies to support the achievement of health objectives. It denotes the general use of information and communication technologies (ICT) for health and includes both mHealth and eHealth.

Digital health interventions can comprise a range of **technologies** including artificial intelligence (AI) and machine learning; telemedicine; computational medicine; biomedical analytics; healthcare systems engineering; data management; clinical engineering; wearable technology; biomedical sensors and processing; health economics; digital therapeutics. Digital health involves an array of **activities**, for instance, in the design, implementation and operation of national health information platforms, the provision of mobile applications for data gathering, the use of short messaging services, interactive voice response and health management information systems, digital literacy training, big data analytics and even the deployment of drones.[2]

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[1] World Health Organization: WHA58.28 eHealth. eHealth Resolution to 58th Meeting of the World Health Assembly. 121–123 (2004). https://www.who.int/healthacademy/media/WHA58-28-en.pdf

[2] World Health Organization, Monitoring and Evaluating Digital Health Interventions: A practical guide to conducting research and assessment, WHO, Geneva, 2016. https://www.who.int/reproductivehealth/publications/mhealth/digital-health-interventions/en/

Name of organisation:

Name of participant(s) completing the survey:

1) In line with the definition of digital health above, has your organisation used digital technologies in health in the past (from 2018 onwards), is doing so currently, or will do so in planned projects / programmes in future (even if it is just a small component of a project / programme)?

☐ Yes → Please fill in the complete survey. (starting page 2) (skip)

☐ No → Please indicate if you are planning to use digital health technologies in the future and why you are not doing so currently. (skip to the end)

Part 1 – Context

In this survey, we are only assessing the use of digital technologies in health in your organisation from 2018 onwards. Please answer the following questions:

1) In which area(s) are you using digital health? (tick all that apply)

☐ *Health service delivery*
☐ *Health promotion / prevention*
☐ *Capacity building in human resources for health*
☐ *Health data management*
☐ *Health research*
☐ *Institutional support*

2) For which purpose(s) are you using digital health technologies in health?[3] (tick all that apply)

☐ *Census, population information, surveys and data warehousing*
☐ *Civil registration and vital statistics*
☐ *Client applications*
☐ *Client communication systems: e.g. transmitting health event alerts, information or reminders*
☐ *Clinical terminology and classification*
☐ *Community-based information system*
☐ *Data interchange, operability and accessibility*
☐ *Electronic medical records: for clients to access their own medical records, or for self-monitoring or the tracking of health or diagnostic data; client identification or registration, referral coordination*
☐ *Emergency response system*
☐ *Environmental monitoring system*
☐ *Facility management information system*
☐ *Geographic information system (GIS)*
☐ *Health finance and insurance information system*
☐ *Health management information system (HMIS)*
☐ *Human resource information system*
☐ *Identification registries and directories*
☐ *Knowledge management system*
☐ *Laboratory and diagnostics information system*
☐ *Learning and training system*

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[3] WHO (2018). Classification of digital health interventions v1.0. A shared language to describe the uses of digital technology for health. https://www.who.int/reproductivehealth/publications/mhealth/classification-digital-health-interventions/en/

    ☐ *Logistics management information system (LMIS)*
    ☐ *Pharmacy information system*
    ☐ *Public health and disease surveillance system*
    ☐ *Research information system*
    ☐ *Shared health records and health information repositories*
    ☐ *Telemedicine*
    ☐ *Other / difficult to categorise (please state):*

3) In which projects or programmes are you using digital health technologies? (tick all that apply)

    ☐ *Adolescent health*
    ☐ *HIV / AIDS*
    ☐ *Malaria*
    ☐ *Maternal, neonatal and child health (MNCH)*
    ☐ *Mental health*
    ☐ *NCDs*
    ☐ *Primary health care (PHC)*
    ☐ *Reproductive health*
    ☐ *Sexual health*
    ☐ *Tuberculosis*
    ☐ *Water, sanitation and hygiene (WASH)*
    ☐ *Other (please state):*

4) At which health system level(s) are you operating? (tick all that apply)

    ☐ *International*
    ☐ *Regional*
    ☐ *National*
    ☐ *Urban*
    ☐ *Rural*

5) What is the status of your digital health project / tool / programme? (multiple choice)

    ☐ *Informal (early adoption of digital technologies for health purposes in the absence of formal processes and policies)*
    ☐ *Pilot (testing and evaluating the use of digital health in a given situation)*
    ☐ *Established (an ongoing programme using digital health)*

6) What percentage of your overall activities are digital health activities?
Please indicate the approximate percentage of your digital health activities in relation to your overall operations.

    ☐ *0% - 25%*
    ☐ *26% - 50%*
    ☐ *51% - 75%*
    ☐ *76% - 100%*

7) How many people / beneficiaries do you reach via the use of digital technology?

    ☐ *0 – 49*   ☐ *301 – 500*
    ☐ *50 – 100*   ☐ *501 – 1000*
    ☐ *101 – 200*   ☐ *More than 1000*
    ☐ *201 – 300*

8) In which countries are you implementing digital technologies for health? (please state)

Part 2 – Digital Technologies Being Used

1) What kind of devices / hardware are you using? (tick all that apply)[4]

- ☐ *Mobile phone – Google Android*
- ☐ *Mobile phone – Apple iOS*
- ☐ *Tablet – Google Android*
- ☐ *iPad – Apple iOS*
- ☐ *Computer (Microsoft Windows)*
- ☐ *Apple computer*
- ☐ *Mobile diagnostic devices,*
- ☐ *Short messaging services (sms; WhatsApp)*
- ☐ *Interactive voice response*
- ☐ *Wearables*
- ☐ *Drones*
- ☐ *Big data analytics*
- ☐ *Other (please state):*

2) What kind of applications or software are you using? (please write down the name)

- ☐ *Free open-source software:*
- ☐ *Proprietary software (licensed software):*
- ☐ *Other:*

3) Did you / your organisation develop the software or was it set up by an external party? (tick all that apply)

- ☐ *By our organisation*
- ☐ *By experts outside the country of deployment*
- ☐ *By experts in the country of deployment*
- ☐ *Don't know*
- ☐ *Comments (please state):*

4) When the tool / project / programme was being designed and developed, did you consider: (please be honest!)

- ☐ *The environment (electricity use, equipment availability)*
- ☐ *Waste management systems (eWaste)*
- ☐ *Integral effects on health systems (direct and indirect consequences)*
- ☐ *Availability of non-digital options*
- ☐ *Digital skills of the recipients*
- ☐ *Ethics*
- ☐ *Data ownership*
- ☐ *Alignment with the national digital health strategy (if it exists)*

- ☐ *Co-development of systems by their intended users*
- ☐ *Evaluation in participatory codes of behaviour*
- ☐ *People with disabilities (blind, deaf, physical impairments)*
- ☐ *Gender sensitivity*
- ☐ *Cultural sensitivity*
- ☐ *Privacy policy (e.g. right to use images)*
- ☐ *Comments (please state):*

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[4] WHO (2018). Classification of digital health interventions v1.0. A shared language to describe the uses of digital technology for health. https://www.who.int/reproductivehealth/publications/mhealth/classification-digital-health-interventions/en/

Part 3 - Governance & Leadership

1) Does the country in which you are implementing a digital health have a digital health strategy?

☐ *Yes*
☐ *No*
☐ *Don't know*

2) Does your organisation have a Memorandum of Understanding with the government(s) of the beneficiaries in the respective country / countries, which regulates data ownership?

☐ *Yes*
☐ *No*
☐ *Don't know*

3) Does your organisation have a digital health strategy or a strategy that includes digital issues?

☐ *Yes*
☐ *No*
☐ *Don't know*

4) Do you have a dedicated unit / team within your organisation that is in charge of digital health or digitalisation?

☐ *Yes*
☐ *No*
☐ *Don't know*

5) Does your organisation have any policies in place with regards to data security?

☐ *Yes*
☐ *No*
☐ *Don't know*

6) Does your organisation have any policies in place with regards to privacy?

☐ *Yes*
☐ *No*
☐ *Don't know*

7) Does your organisation provide ongoing training in the use of digital technologies at its headquarters or onsite?

☐ *Yes*
☐ *No*
☐ *Don't know*

Part 3 - Governance & Leadership

Part 4 – Experiences and Lessons Learnt

1) What do you see as the advantages of using digital technologies in health for your organisation? (please state)

2) What do you see as the challenges of using digital technologies in health for your organisation? (please state)

3) On a scale of 0 to 10, how sustainable is your organisation's approach to digital health?

Part 4 – Experiences and Lessons Learnt

Annex 2 – Telephone Interview

The telephone interview will only be conducted with those organisations that have used or are currently using and implementing digital technologies for health. Its purpose is to gain further insight into the advantages, limitations and challenges of using digital health technologies.

1. Why do you use digital health technologies? What significance do they have for your organisation?

2. How do you resource your projects in digital health?

3. There can be various hindering factors and / or barriers when implementing digital health solutions. What are the most significant ones encountered by your organisation?

4. What could help your organisation to overcome some of these barriers?

5. How do you view the rapid growth of digital health solutions? What is required to avoid harming already effective activities and health systems by digital health projects?

Annex 3 – List of contacts

	Organisation Name
1	Aids-Hilfe Schweiz
2	Association Solidarité avec les Villages du Bénin (ASVB)
3	Associazione per l'aiuto medico al Centro America
4	Basler Förderverein für medizinische Zusammenarbeit
5	Calcutta Project
6	CBM Christoffel Blindenmission (Schweiz)
7	Centrale Sanitaire Suisse Romande
8	Comundo
9	Enfants du Monde
10	FAIRMED - Gesundheit für die Ärmsten
11	FEPA - Fonds für Entwicklung und Zusammenarbeit
12	Fondation Suisse pour la Santé Mondiale
13	Graduate Institute of International and Development Studies (IHEID)
14	GRUHU
15	Handicap International
16	Hilfsverein für das Albert-Schweitzer-Spital Lambarene
17	Homéopathes autor du monde Suisse (hm Suisse)
18	IAMANEH Schweiz
19	Institute of Social and Preventive Medicine (ISPM)
20	Comundo
21	Kinderhilfe Bethlehem
22	Kwa Wazee
23	Médecins du Monde Suisse
24	medico international schweiz
25	mediCuba-Suisse
26	mission 21
27	Novartis Stiftung für Nachhaltige Entwicklung
28	OBI International
29	Pharmaciens sans Frontières
30	Pro Indigena
31	Researchers for Global Health
32	Ruedi Lüthy Foundation
33	Save the Children Schweiz

34	Schweiz. Gesellschaft für Tropenmedizin und Parasitologie SGTP
35	Schweizer Partnerschaft Hôpital Albert Schweizer , Haiti
36	Schweizerisches Rotes Kreuz
37	Schweizerisches Tropen- und Public Health-Institut
38	Service de médecine tropicale et humanitaire (SMTH)
39	SEXUELLE GESUNDHEIT Schweiz
40	SolidarMed
41	souffle2vie
42	Stiftung terre des hommes
43	Suisse-Santé-Haïti
44	SUPPORT
45	Swisso Kalmo
46	terre des hommes schweiz
47	Women's Hope International