The impact of the IICD health projects

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The International Institute for Communication and Development (IICD) is working in various countries in Africa to improve development by using information and communication technology (ICT) tools in amongst others health care. One of the guiding principles of IICD's work is local ownership. Local ownership indicates that IICD's local partners are ultimately responsible for the results of their supported activities. IICD's monitoring and evaluation (M&E) system allows local partners to learn and grow from their experiences. This brief, based on the M&E data of the health projects, aims to explore the impact of these projects.

"I am very appreciative of this questionnaire. I sincerely hope that responding to it will have a positive bearing on the future association and improvement of the project."
- End user of one of the health projects

Introduction

Development is a complex process and it is difficult to measure the impact of information and communication technology (ICT) on health care isolating its effect from other influences, even within the setting of a project this is not an easy exercise. Nevertheless, it is important to have mechanisms in place for monitoring and evaluation (M&E) that enable those involved in the project to assess over time the effects of ICT interventions on health care.

One of the guiding principles of IICD is local ownership, a principle which forms the basis of its evaluation methodology. M&E is seen as a tool for learning rather than control, and is carried out by a local organisation in each country IICD is active in. The M&E approach is twofold: gathering data regarding the impact and the profile of end-users of the projects (age, income etc.) and using questionnaires and focus groups to gain an insight from the participants themselves on how the project has affected them.

This brief was made to serve as input for a Cross Country Learning Event (CCLE) on health, a workshop providing Southern project partners an opportunity to share experiences, learn from each other and give their opinion on the impact of the IICD projects. This brief explores whether ICT is used effectively to strengthen a conducive

policy environment for the health sector, to improve the management of and access to information for health staff and to strengthen the delivery of health care services and

information for patients and people in the community. This is done by analysing the M&E data that have been gathered from the IICD projects in health. These data provide more insight into the satisfaction of project users with the services they utilise and how the project has impacted their lives in terms of awareness on ICT, empowerment and the impact on health care.

The brief starts by briefly exploring how ICT can strengthen the health care sector and links these interventions with the IICD health projects. The second part discusses the M&E results and the last summarises the main lessons-learned from the health projects.

1. ICT in support of health care

Studies undertaken by the World Bank[1] and infoDev[2] provide a useful framework for clustering ICT interventions in the health sector and show how they could contribute to better health care with the ultimate aim to reduce poverty.

In this paper, the different ICT interventions are clustered to distinguish between the different categories of project users: policy-makers, health staff, health students, patients and people in the community. This classification is useful for IICD, as it better allows attributing impact to our different groups of project users.

Three groups of interventions are identified:

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1. Support **policy-makers** with creating a conducive policy environment: health is a key sector for development and plays a crucial role in poverty eradication. Therefore, a concerted and guided use of ICT in the health sector is crucial for a more cost-effective and better performing sector, which avoids duplicating activities and provides quality services.

2. Improving the management of and access to information and knowledge for better health care delivery by **health staff and/or health students**: health data is arguably one of the most important aspects of health care intervention. Three types of information are needed for health staff:

a. ***Health, hospital and patient information:*** accurate and timely data helps to plan and prepare health policies. An efficient information system also has the potential for better coordination, transparency and accountability. The health sector in most developing countries suffers from inefficient management practices due to a number of factors, including a shortage of staff and high turnover rates, the low quality of information from health facilities and the long time needed from health staff to collect the data.

b. ***Professional development and Continuous Medical Education (CME):*** although health staff often works in rather isolated areas it is crucial to be kept up-to-date with the latest news. Therefore tools like Internet, audio-conferencing, CD Roms and Personal Digital Assistants can help to keep health staff informed and allow health staff in turn to get access to knowledge and information.

c. ***Telemedicine:*** can be an effective tool in the delivery of health care services, improving the delivery of health care where distance is a critical factor, by health care professionals using information and communication

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1 *ICT and MDGs: A World Bank Group Perspective*. Washington DC: World Bank Group's Global ICT Department, 2003.
2 *Improving health, connecting people: the role of ICTs in the health sector of developing countries – A framework paper*. London: infoDev, 2006.

technologies for the exchange of vital information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interest of advancing the health of individuals and their communities (WHO, 2004).

3. Improving access to information for **patients and/or people in the community**: this may involve health education/promotion and disease prevention (Public Health) using radio, Internet or television in the appropriate location, transmitting the appropriate content, in the appropriate language.

Progress in each of these three main areas can be encouraged by a number of ICT interventions, of which examples are shown in table 1. In this paper, we draw upon twenty IICD-supported projects involving the use of ICT in health in five countries. The projects reviewed can be grouped according to the areas of intervention set out above. In table 1, each of the three areas of interventions is illustrated by examples of IICD projects.

2.   Impact of ICT projects

Since 2005, a total of 350 questionnaires has been collected for a subset of seven projects in implementation in five countries. The other projects started implementation more recently and data collection has therefore only just started. The next sections will provide an overview of the profile of the project users and the impact of the projects.

2.1   Profile of project users
The profile of the project users can be defined by analysing the data on rural/urban spread, education levels, income levels, age and gender. The main indicators are summarised in table 2. These data assist in analysing the project users that are being reached and their socio-economic position. Each of the three main areas of the IICD interventions has different project users.

Policy-makers are the main target group of the interventions to create a conducive policy environment. The Health Management Information System and telemedicine projects mainly work with health staff, whereas the professional development/CME projects target both health staff as well as health students, of which some of them even target the general public. The last group of projects aiming to improve the access to information directly targets patients. Some of these projects target the broader community like for example the project of Sahel Solidarité in Burkina Faso that educates villagers about hygienic use of water. This type of project tends to have project users in rural areas, with a lower than average level of education and mainly comprising of males.

Within these three groups a distinction can be made between direct users and indirect users. Direct users are people trained in the use of ICT who directly contribute to or use ICT and the related information services provided by the project, like policy-makers, health staff and the health students who fulfil an active role. Indirect users are those who benefit from the projects, but are not receiving information services through the project directly. The indirect users here are the patients (except for the third group of projects), who benefit from better service delivery. This is for example the case with telemedicine projects, as this method allows hospital staff in remote hospitals to send and receive scans and diagnoses from experts in the capital. This often leads to better diagnoses and treatment of patients and a direct economic benefit for the patient due to a reduction in travel costs, but the patient does not interact with the ICT directly.

Table 1 – Overview of IICD projects, connected to the health related MDGs

	Project users	Possible ICT interventions	IICD Projects
1.	Support **policy-makers** with creating a conducive policy environment	- ICT policy and strategy development in the health sector - ICT implementation plan	1. Support to ICT Sector Policy, Strategy and Implementation Plan for the health Sector in Ghana* 2. Strategizing ICT for health in Tanzania* 3. Support for ICT Policy and Strategy in Uganda*
2.	Improving the access to and management of information and knowledge for better health care delivery by **health staff and/or health students**	***a. Management of health, hospital and patient information*** - Management and logistics of patient care - Administrative systems - Patient records - Ordering and billing systems - Disease surveillance and epidemiology - Critical decision support systems - Quality assurance systems - Patient information - Biomedical literature search and retrieval ***b. Professional development and Continuous Medical Education*** - Health research ***c. Improving the delivery of health care*** -Telemedicine and remote diagnostic support -Diagnostic imaging	4. Information and Data Management for Continuing Medical Education in UCMB Health Units (Uganda) 5. District Health Management Information Systems (D-HMIS in Tanzania) 6. Development of Management System for Health Facility (Tanzania) 7. Integrated Patients Monitoring System* (Zambia) 8. Integrated Blood Donor Data Base Management System* (Zambia) 9. Development of MIS for linking CHAZ members to the secretariat and other health centres networks* (Zambia) 10. Reseau Informatique Malien d'Information et de Communication Médicale : Keneya Blown 11. Centre National de Référence d'Activités E-Santé (REIMICOM in Mali)* 12. Promoting Continuous Medical Education among Rural Health Workers by Use of ICT (Uganda) 13. Web Portal Services of Ayfa Net* (Tanzania) 14. Modular Strategic Implementation of ICT in Health Care Facilities* (Tanzania) 15. E-learning Incubator for Health Workers* (Tanzania) 16. Establish information and communication centres at the Zambia Nurses Association (ZNA) offices* 17. Telemedicine Tanzania* 18. Projet de Téléradiology au Mali (IKON) 19. Open Yalim 2 (IDC in Mali)*
3.	Improving the access to information for **patients and/or people in the community**	- Interactive communication - Media approaches - Advocacy to improve services	20. Sahel Solidarité (Burkina Faso)

Note: *All projects with a star (*) are not included in the data analysis, as most of them just started implementation and no M&E data have been gathered yet.*

Gender balance in "a traditional way"

The data show that the majority of men are working as technical staff, while women are more represented in the administrative/ support functions. This gender difference is also seen in the levels of education: more men than women have attained tertiary education. It is therefore observed that for the projects on management of information, which is mainly done by administrative/ support staff, more women than men have filled in the questionnaires, whereas in projects focusing on improving the delivery of health care, like telemedicine, we see the contrary as technical staff is more heavily involved in these types of projects. The data further show that the participating women mainly reside in rural areas, whereas men more often reside in provincial towns or the capital city. We can therefore conclude that although there is no gender balance in all projects, in some of the projects women are more actively involved than men.

2.2 Impact of the health projects

In order to measure the impact of ICT projects on poverty alleviation, the M&E methodology provides insight into the following aspects that are relevant for the health projects:

- Satisfaction with the ICT and information services provided through the projects;
- Awareness among project users on the possibilities of using ICT to improve health care;
- Empowerment of the project users in terms of an increase in skills, social status, self-confidence and influence on decision-making;
- Impact on healthcare: this is also called sector impact and measures amongst others whether the project has resulted into more customised patient records and better health care delivery.

The first indicators are the level of satisfaction (69,6%) with ICT and the related information services and awareness (72,8%). Both indicators are relatively high: most users were satisfied with the information and the services they received, and although satisfaction rates on the cost of the service were rated somewhat lower (51,4%), this is still above average. Awareness is relatively high, although it has decreased somewhat over time. This is not surprising as we see that in general awareness tends to decrease over time: after the initial boost of energy created by seeing all new possibilities ICT offers for projects, the initial enthusiasm decreases somewhat to a more "stable level" in the longer run.

Most respondents (72%) indicated that they have achieved their goals by participating in the project. In some projects this can easily be shown, like for example in the District Health Management Information System project in Tanzania, where well kept and easily accessible patient records can now be found as a result of the project. In cases where people indicated that their goals were not achieved, they would like to have received more on-the-job training or possibilities to practice. Practising is sometimes not possible due to a lack of infrastructure and/or Internet connectivity in their institutions. Another obstacle to achieve goals was explained by a staff member who indicated that: *"the data system was to be used in multiple departments and coordination was difficult as the importance of keeping data up-to-date was not considered as important by some of the other departments"*.

Table 2 - Monitoring and Evaluation data; Respondents' Profile
(From 7 IICD-supported projects in the health sector the weighted average is calculated)

Geographical area	Rural	42,5%
	District or provincial town	32,1%
	Capital city	25,4%
Education	Primary	8,7%
	Secondary	28,7%
	Tertiary	62,6%
Age	Below 30	28,5%
	Between 31 and 40	38,2%
	Above 40	33,3%
Gender	Female	38,6%
	Male	61,4%
Income level	Below average	25,7%
	Average	64,5%
	Above average	9,8%
Position in institution	Manager	5,0%
	Director	2,4%
	Technical staff	42,2%
	Administrative staff	11,0%
	Teacher	4,4%
	Student	8,2%
	Other	27,2%

More than half of the project users indicated that they feel empowered. It is rather interesting to see that empowerment tends to be a rather stable indicator over time and across different (groups of) projects. As will also be shown in the next section on the impact of the different types of intervention, levels of empowerment tend to be in the range of 40-55%, except for the Sahel Solidarité project (where empowerment is much higher).

The impact on health care of 53% is also relatively high, and may be explained by the fact that the statements used are a good measure to capture progress in the health sector, as for example: *"this project has resulted into more customised patient records" and "the project has resulted in better health care".* Additionally, the more mature projects also do show a higher impact, indicating that it may take some time before the impact on health care becomes "visible".

2.3   Impact on health care for the three types of interventions

The M&E data are also analysed per type of intervention and the results are shown in table 3. The impact on health care is being analysed for two of the impact indicators; awareness and impact on health care. No M&E data are available for the policy projects. Although a conducive policy environment could have an important impact on health care, experiences and former studies have learned that this will take a huge amount of time and is highly dependent on external factors like politics and decentralisation. Therefore, until now the expected impact on health is still relatively modest. Experiences have shown though that it often creates a lot of enthusiasm and awareness among government officials to see the potential of using ICT in the health sector. Training and informing policy makers can therefore be a very useful first step to create more awareness.

The projects focusing on health staff showed a mixed picture

The projects that aim to improve the management of and access to information and knowledge for health staff present a more diverse picture, as the impact of the management of health, hospital and patient information projects (component 2a) is different than that of the professional development/CME projects (component 2b) and that of the projects focusing at improving health care delivery (component 2c). Therefore, the M&E data for these subgroups are analysed separately. The main differences between the two subtypes are that the impact on health care for the Information Management projects is relatively high, whereas the professional development/CME and telemedicine tends to have a higher impact on awareness.

For the telemedicine projects it is observed that both awareness and the impact on health care in these projects are relatively high, with awareness rating the highest. This is probable due to the fact that these kinds of projects will result in decreased travelling costs for patients who often live in remote rural areas, so it may create awareness among the users on the importance of ICT. The project also improves the quality of health care services (impact on health) as it will allow doctors to make better diagnoses.

The projects focusing on improving the access to information for patients and/or the community tend to have a very high overall impact, both in terms of awareness as well as of health care. The very high level of awareness could be explained by the fact that sensitisation of end-users is the main objective of these projects.

Empowerment is a relatively stable indicator across all types of projects

Another interesting finding is that empowerment tends to be a rather stable indicator across all projects (and therefore not shown separately here). This indicator is showing relatively little variation over time and across the different types of intervention. In Uganda, analysis of the M&E data showed that the level of empowerment is related to the quality of the training, the

services and the information provided within the projects. For example, those who were not satisfied with the training also tend to have lower rates of empowerment (only 18% empowerment compared with 41% of those who were satisfied). Although the level of empowerment is not low, ranging between 40% and 55% for all the different projects, it would be very interesting to analyse in more detail why this indicator is relatively stable over time and across the health projects.

3.   Practical lessons learned

3.1   General lessons learned

✓ *Embedding as an integral part of the health projects*

From the start, it was clear that the Keneya Blown project in Mali needed a large 'embedding' component, on different levels. Amongst the public there was a lack of information and knowledge about most health issues: availability of services, hygienic measures, prevention, self-treatment etc. Amongst health professionals in Mali there was a lack of awareness around the opportunities of ICT for health, and also some resistance against the introduction of these tools (which is understandable, given the lack of almost everything in the sector). Amongst decision-makers, there was a lack of knowledge, expertise and experience-based evidence on ICT for health, leading to a strong dependency on foreign and industry-lead advice. A very successful way of embedding the programme within the provincial hospitals appeared to be the in-site workshops. These ICT-training workshops in the provincial hospitals not only helped to create awareness and enhance ICT-skills, but also encouraged and motivated regional political decision-makers.

Embedment of the project in the host organisation also turned out to be very important in other countries, like Tanzania and Uganda. Experiences in these countries learned that it is crucial to involve decision-makers from the beginning of projects onwards and to help them to understand the benefits. IICD should also have a very good knowledge of the policy, environment and people involved in the organisation and care should be taken of whom to invite when.

Other actions to enhance embedment could include:

- Assembling committees of end users
- Identifying a person who succeeds a project officer when she/he leaves

✓ ***Budget the cost of services and cover connection costs for all services in one package***

In Tanzania, the issue of satisfaction with the cost was taken up in a focus group discussion and the participants pointed out that there are heavy costs involved in running an ICT project. These include:

- The cost of equipment such as computers, printers, backup devices and networking facility
- Infrastructure such as electricity, LAN, connectivity
- Time – volume of work and schedules
- Human resources – ICT personnel and quality of education
- Maintenance and repair
- Capacity building
- Labour turnover
- Opportunity cost of forgone expenditure on other areas of the hospital

budgeted for they should include all services that need an Internet connection, including MIS, telemedicine, CME, etc.

3.2 Support policy-makers with creating a conducive policy environment

✓ ***Combine the use of ICT applications with capacity development activities***

A concerted and guided use of ICT which will not only focus on ICT applications for the health sector and ICT infrastructure but also on capacity development at all levels in the sector will be more cost effective and boost performance and quality.

✓ ***A multi-stakeholder and participatory approach is inevitable***

To build up a consistent ICT implementation strategy in the health sector requires a multi-stakeholder and participatory approach. It helps to identify areas where the performance can be boosted. In Uganda, an impressive portfolio of initiatives using ICT as a tool started in the Health sector.

Impact of IICD health projects
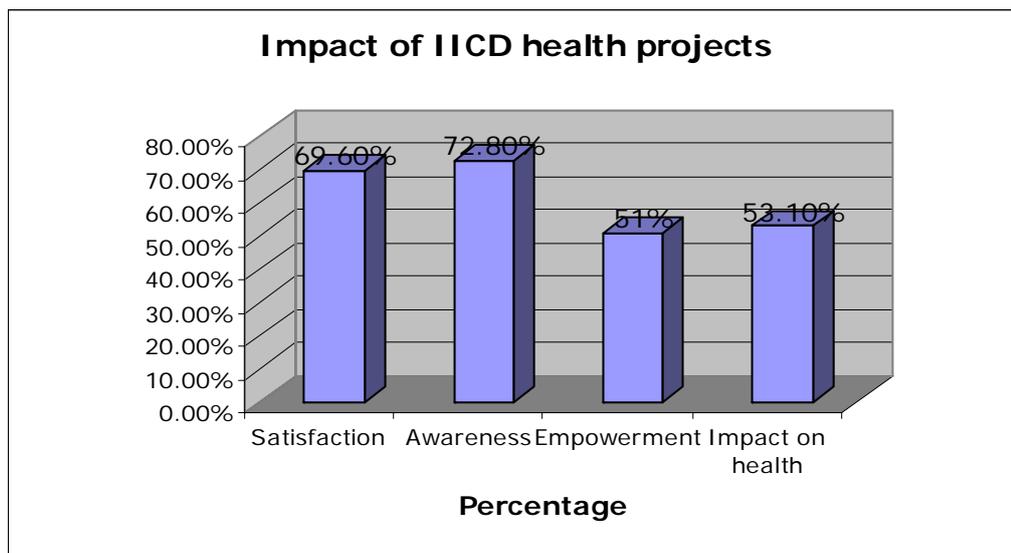
At the start, unless a very clear analysis has been made, the costs are not clear. If the other items have not been budgeted for from the very beginning, a health facility entering an ICT project might fail to continue after its initial start. The experiences in Mali have shown that it is also crucial to make sure that if Internet connection costs are

Much attention was paid to ensure that these initiatives would not become islands. Harmonization of initiatives, standards for data formats, hard and software, guidelines for investments are crucial to reduce investments and recurrent costs. The multi-stakeholder and participatory approach makes this possible.

Table 3 – Direct and indirect impact on health care of different types of interventions

	Using ICT to improve health care	Possible ICT interventions	Awareness	Impact on health care
1	Support **policy-makers** with creating a conducive policy environment	-ICT policy and strategy development in the health sector -ICT implementation plan	Expected high impact	Expected low impact
2	Improving the management of information and access to information and knowledge for **health staff**	*a. Management of health, hospital and patient information* -Management and logistics of patient care -Administrative systems -Patient records -Ordering and billing systems -Disease surveillance and epidemiology -Critical decision support systems -Quality assurance systems -Patient information -Biomedical literature search and retrieval	Average impact (53,0%)	High impact (61,5%)
		b. Professional development and Continuous Medical Education - Health research -Continuing professional development of health workers	High impact (79,8%)	Low impact (32,7%)
		c. Improving the delivery of health care -Telemedicine and remote diagnostic support -Diagnostic imaging	High impact (77,8%)	Average impact (48%)
3	Access to information for **patients/ the community**	-Interactive communication -Media approaches -Advocacy to improve services	High impact (92,3%)	High impact (79,5%)

3.3 Improving the management of information and access to information and knowledge for health staff

✓ *Using HMIS for organisational development*

In Uganda, we have learned that using the Health Management Information System (HMIS) for organisational development instead of simply fulfilling reporting requirements is much more effective; it can then also be used to build management capacity, enable informed decision-making and strengthen lobbying.

In Tanzania it became clear that the effectiveness of the Health Management Information System could be strengthened even more when it was linked with the government reporting system. Otherwise different reporting systems might create extra work, whereas now it will save health staff a lot of work.

As is the case with other projects; in order to be successful, a Health Management Information System needs to be firmly embedded in the organisational processes of an organisation, and needs to be politically and technically supported by the main stakeholders in the sector.

✓ **Start with one specific theme in one hospital and expand only gradually**

Experiences have learned that it is better to start with only one topic in one hospital and to build upon that and expand in the longer run. It is also crucial to give doctors and medical staff the recognition for their important role in and work for the organisation. Change management is complex and must be done carefully, step by step.

Based on the IICD experiences elsewhere, it is recognized that even with the best of intentions, managers and project leaders can sometimes overlook elements of the change process. This can result in workplace disruption and disharmony which impede the success of the change process. In Zambia, it has therefore been decided to start with change management workshops, even before implementation starts. The workshops aim to assist change agents to consider the necessary factors required to implement successful change processes.

3.4 Improving the delivery of health care and access to information for patients/ the community

✓ **Good results can be obtained with scanners that do not necessarily respond to the professional western standards**

One of the lessons learned already during the first year of implementation of the IKON project in Mali, was that these scanners worked well, thus allowing considerable cuts on investment costs as the equipment is very expensive.

✓ **Invest in building good relationships with main stakeholders**

In Mali, the health sector is found to be conservative: technical innovations and proposed changes in work flow or work dynamics are very reluctantly accepted and therefore building good relationships with the main stakeholders, including the Ministry of Health is crucial to gain confidence. However, experiences also showed that having a good project in place will already help enormously to create awareness on the opportunities of for example E-health within the health sector in general and the Ministry in particular.