

# Gender Digital Equality In ICT Interventions In Health: Evidence From IDRC Supported Projects In Developing Countries

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## Abstract

New information and communication technologies (ICTs) such as mobile phones and the Internet are considered important instruments for advancing social and economic development throughout the world. The benefits of ICTs, however, have not been evenly distributed among individuals with different socio-economic status. For example, few studies consider how ICTs affect men and women differently. The dearth of studies that integrate gender analysis is particularly true in the case of ICT interventions in the health sector, broadly known as e-Health. e-Health refers to the use of ICTs in different aspects of healthcare including healthcare delivery, administration, education and communication. While there is a growing focus on the potential impact of e-Health applications and practices in developing countries, little attention is given to how the technologies can address women's health concerns or how particular interventions affect men and women differently. The objective of this paper is to explore the gender dimensions of e-Health interventions in developing countries. A select number of projects funded by Canada's International Development Research Centre (IDRC) are systematically analyzed to draw out good practices in integrating gender analysis in e-Health research projects. We conclude by summarizing the good practices and applying them to analyze new projects to ensure gender is integrated adequately. The paper underscores that e-Health interventions in developing countries need to better articulate the social processes of inequality that affect access and use by men and women.

## Introduction

Access to and use of information and communication technologies (ICTs) are considered important for improving health outcomes for different socio-economic groups in the developing world. ICTs are increasingly being used in different aspects of healthcare including healthcare delivery, administration, education and communication, broadly known as e-Health. Over the past ten years, many international development organizations such as the Rockefeller Foundation, World Bank/infoDev, and Canada's International Development Research Centre

(IDRC) have sought to introduce effective and innovative e-Health solutions. In 2005, the World Health Organization (WHO) adopted a resolution for an e-Health strategy and established the Global e-Health Observatory which will monitor e-Health systems and service particularly in low and middle-income countries.

While there is a growing focus on the potential and impact of e-Health in the developing world, few studies give attention to how ICTs can address women's health concerns or how particular interventions affect men and women differently. While new ICTs like mobile phones and the Internet are increasingly more available worldwide (Orbicom 2007), benefits of ICT have not been evenly distributed within and between countries and certain socio-economic groups and individuals, such as people who are illiterate, the disabled, and indigenous peoples; have fewer prospects of benefiting from ICTs (DAW 2005). Women constitute a majority across these groups (Hafkin & Huyer 2002). Given the uneven distribution of the benefits of ICTs, there is a need to take stock of the experiences and understanding of gender analysis in e-Health projects/programs and how power relations, specifically social and gender relations, mediate e-Health interventions. In this paper, we explore the gender dimensions of e-Health interventions to draw out good practices in gender integration in IDRC supported projects in developing countries.

IDRC, a Canadian agency founded in 1970, works in close collaboration with researchers from the developing world in their search for the means to build healthier, more equitable, and more prosperous societies. Through its Information and Communication Technologies for Development (ICT4D) programs, IDRC has been providing grants for research in the area of e-Health in Asia, Africa and Latin America. Exploring how ICTs can solve health problems was part of IDRC's early work in ICT4D. More specifically, IDRC was interested in answering questions such as the following (Elder & Clarke 2009, 68):

- How can ICTs play a role in providing health care services to rural and remote regions of developing countries?
- Which applications afford the most potential with respect to effectiveness, adaptability and sustainability?
- What are the challenges to setting up e-Health programmes in developing countries?
- How do different user groups access and use these programmes?

Several studies have provided systematic overviews of the IDRC e-Health interventions (Molin 2006; Elder & Clarke 2009; Elder & Clarke 2007; Rashid & Elder 2009; Scott & Sayeed 2007). Many of the e-Health innovations and approaches are still at a relatively new stage of implementation, with insufficient studies to establish their relevance, applicability or cost effectiveness (Elder & Clarke 2007). Nevertheless, there is sufficient evidence generated from work carried out by IDRC partners and others to show that e-Health applications can have many benefits including direct benefit to patients.

One area where more evidence is required is how different user groups such as men and women participate in and benefit from e-Health initiatives as patients and practitioners. In the current programming cycle, all three of IDRC's regional ICT4D programs have devoted increasing

attention to gender and women's empowerment in the Information Society and to ensuring that gender analysis is integrated in all research projects (PAN 2006; Acacia 2006, CEA 2006). We ran keyword searches (gender, women, men) through 17 e-Health projects approved by IDRC since 2005 (see annex 1). The results were uneven at best. Gender analysis was integrated into few of the projects. In some cases, sex disaggregated data and issues of gender inequality relevant to the problem were raised in the 'background and justification' section of the proposal only to be left unaddressed in the articulation of objectives, research questions and the methodology section. Often gender is relegated to discrete paragraphs on 'gender considerations.' In many cases the discussion of gender is limited to aspects of women's participation; rarely is it discussed in terms of gender equality. It is against this backdrop that we investigate the gender dimensions of IDRC-supported e-Health projects by examining a few case studies to draw out good practice in gender integration.

The argument of the paper is structured as follows. In the first section, we explore questions of gender inequality as discussed from the perspectives of sociology of health; ICT4D, with specific reference to e-Health projects to establish the need for gender analysis in e-Health initiatives. This allows us to situate our analysis within broader theoretical discussions of gender inequality. The IDRC projects are then evaluated to determine whether they integrate gender analysis into the design and implementation of the project including considerations of gender and social inequality and the constraints to women and men benefiting from e-Health. On the basis of our analysis, we apply the lessons learned to a discussion of a recent project to suggest how new proposals might be examined to ensure gender analysis is integrated appropriately.

## **Gender, health and ICTs**

### *Gender and health inequalities*

The literature from the field of sociology of health makes several assertions relevant to the design and implementation of health interventions which we discuss below. 1) The literature strongly argues for the integration of social and gender analysis in all health programs and interventions; 2) The social and economic vulnerabilities related to gender inequalities are evident in the health system through inequalities in accessing health care and in the differential position of women and men as both users and producers of healthcare; and 3) The causes of gender inequalities in health are complex – related to both larger socio-cultural power relations and the different health needs of women and men.

Literature from the field of sociology of health strongly asserts the need for gender and social integration in all health programs and interventions for a wide variety of reasons. Standing (1997) highlights the fact that globally, women are found disproportionately among the most vulnerable groups: women tend to have lower incomes compared to men. Expenditure on health for women is less than that for men in both urban and rural areas (Timyan et al 1993). Other social factors that mediate health outcomes include level of education, women's gendered roles such as caregiving responsibilities, division of labour at home, nature of women's labour force participation, etc. For instance, the greater burden of being the primary care giver and the resultant division of labour means that women have higher opportunity costs in seeking health treatment (Leslie 1992; Okojie 1994). Education has an affect on women's health not only

because it influences employment and income but also as it facilitates better access, understanding and use of health-related information (Colman 2003).

Gender is a significant marker of social and economic vulnerability which is manifest in inequalities of access to health care and in women's and men's different positioning as users and producers of health care (Standing 1997). The social mechanisms of health inequality are accentuated in the context of developing countries (Okojie 1994; Vlassoff 1994). In many patriarchal societies, definitions of health status and traditional medical practices reflect the subordinate social status of women. Evidence shows that in many instances, women cannot decide to seek healthcare on their own (Okojie 1994). Some reasons for health inequalities include emphasis on women's childbearing role resulting in early and excessive childbearing, sex preference manifested in discrimination against female children in health and general care, women's workloads which result in being exposed to health hazards and having less time to seek healthcare and lack of decision-making power (Okojie 1994). Vlassoff (1994) highlights the lack of gender-sensitivity in the provision of health services including health information and communication between patient-client privacy and confidentiality, among other areas. Access and utilization of health services are influenced by cultural and ideological factors such as embargoes on consulting male practitioners, lack of freedom to act without permission of husbands or senior kin (Standing 1997). As such, from a gender perspective, allocation of household resources and power is critical. Tipping & Segall (1995) argue that often the health needs of women and girls are given less importance and value compared to men and boys.

The root causes of gender differences (or inequalities) in health are complex. Broadly, an examination of gender inequalities in health has prompted the development of two understandings of the root causes of this inequality (Standing 1997; Doyal 2000). The first one emphasizes the similarities and differences in the health needs of men and women. For example, many health inequalities are linked to biological and sex-specific conditions such as reproductive health, breast cancer or male infertility. The second approach focuses more on gender (in)equality which considers the social obstacles that differentially affect men and women from realizing their potential for health. The social determinants of health inequalities between men and women emphasize the processes through which different social roles of men and women in society influence health outcomes (Denton et al 2004; Standing 1997; Doyal 2000). Such gender based analyses take into account the issues of men and women's social location, relations of power and access to resources (Donner & Pederson 2004).

### *Gender and ICTD - Exploring the Dimensions of Digital Inequality*

ICTs can have profound implications for women in terms of a number of socio-economic domains including health, education, and livelihoods (Gurumurthy 2004; Odame 2005). Despite the potential, a significant gender inequality persists in established and emerging Information Societies. The literature on gender in ICTD suggests that it is necessary to unpack the field by examining the nature and causes of gender inequality in ICTD projects. Our understanding of this inequality and our ability to address it are hampered by the lack of sex disaggregated data in developing countries and reinforced by gender biases in program design. The gender inequality in ICT4D is complex in that it both shapes and is shaped by power relations within households

and society at large. The literature therefore, asserts the need to focus on the nature and effects of inequality in ICTD.

As indicated above, one of the main problems in understanding the gender digital divide is the dearth of sex-disaggregated data in developing countries. Despite the lack of gender specific quantitative data, project level qualitative data have established that ICTs are not gender neutral (Hafkin & Huyer 2007). Estimates in Africa indicate that women comprise 25% or less of Internet users (Hafkin & Huyer 2007, 27). In terms of practical implementation of ICT interventions the literature suggests that there is an overall gender bias in ICT projects. Hafkin and Taggart (2001) highlight three reasons for this bias, 1) women are rarely involved in the needs assessment of ICTs for development; 2) attitudes that high-end information technology is not for women' who are still being treated as passive recipients of information and not as active information users and communicators; and 3) there is considerable delay in addressing the limitations faced by women in accessing supposedly public' information spaces.

While the gender dimension of the digital divide provides us with some idea about the unequal access to different forms of ICTs, it does not explain the underlying mechanisms of these inequalities. As one author argued, "gender statistics on access to Internet are only the tip of the iceberg that hides much deeper social psychological and social structural mechanisms reinforcing a gender typing in almost all aspects of technology" (Cuneo 2002, 26). Gender inequality in access to, use of and benefit from ICTs is higher in countries that have deeper social divisions based not only on gender discrimination, but also on other variables associated with gender like education, income, socio-economic status, and occupational stratification (Hafkin 2002). For example, rural women are more disadvantaged as compared to younger, literate or wealthier urban women (Odame 2005, 15). In countries with entrenched patriarchal structures, the nature of ICTs access and use is influenced by discriminatory practices that exclude women. For example, in the study conducted by the Gender and ICT Network (2006) in western Africa, it was found that some men feel threatened when women used cell phones or accessed the Internet and they tried to control ICT use by women. This suggests that cultural norms are important determinants in gender differences in the use of technology.

The concept of the digital divide needs to be re-oriented to a different standpoint, one of digital equality, where emphasis is placed on analyzing technology access in terms of social inclusion to encompass the wide range of physical, digital, human, and social resources that meaningful ICTs entail (Warschauer 2003). For example, the capability to effectively information obtained through ICTs is dependent on literacy and education and women in developing countries are less likely than men to have the requisite literacy, language, computer skills and information literacy (Hafkin 2002). At the same time, women's relative poverty places them at a disadvantage in terms of accessing ICTs-- women are less likely to own communication assets such as radios, mobile phones, and computers (DAW 2005).

#### *Gender considerations for e-Health interventions: some insights*

The gender dimensions of e-Health interventions reflect the complexity of gender relations in both health and ICT interventions. For example, an infoDev project using Personal Digital Assistants (PDAs) for health data collection in Nalgonda district of Andhra Pradesh, India

provided tools that allowed auxiliary nurse midwives (ANM) to reduce time spent doing paperwork and increase the accuracy of data (Hafkin & Huyer 2002). ANMs were given PDAs and training on how to use them for data entry and linkage with primary health centres. An analysis of the gender dimensions of the project by Hafkin & Huyer (2002) revealed that gender was not included in the project objectives. The emphasis of the project was on the convenience of the technology, and the possible resulting improvement in service.

Several *gender* issues became apparent in the project implementation and outcome. One of the most notable issues that emerged from the project was that no target groups were involved at the planning and design stage. The consequence was that the collected project data designated by the health officials to be important for women actually did not reflect the health concerns of the women in the area. For instance, while national and district level medical officers were intent on data collection on family planning and immunization, women's health priorities in Nalgonda included joint pains, reproductive-tract ailments, anemia, childbirth and infant health issues. Furthermore, although the content of reproduction issues has significant gender implications, the data collection program of the project treated reproduction as purely a women's issue.

At the same time, the intervention narrowly focused on women which led to perceptions of gender inequality amongst practitioners. When PDAs were distributed to ANMs, their male counterparts (MHWs-- male health workers) protested that they had not been given PDAs. to the extent that PDAs were later distributed to MHWs as well. One of the lessons emerging from the project was that ANMs should work with MHWs on the issues of reproduction as women's reproductive health is highly influenced by the attitudes and behaviours of men. This case underscores the need to understand gender inequality in health planning and priority-setting (i.e. by understanding better the different health demands of women and men without compartmentalizing them as *women's* issues or *men's* issues) and the need to understand the way that the introduction of technologies are politicized through local gender power relations.

The Midwives to Mobile-Phone project in Aceh Besar, Indonesia (Chib et al. 2008) tested a model for understanding the value of ICTs for healthcare development. The model builds on the *value-of-ICTs-to education* framework by incorporating an analysis of four inter-related barriers to ICT usage including technological, infrastructural, economic and socio-cultural. Notably they highlight the need to examine cultural barriers and gender inequalities which may hinder the adoption of ICTs. Their research did not uncover negative attitudes or behaviors related to midwives use of mobile phones in the villages; to the contrary, in some cases it enhanced their credibility with patients and their families. The research did however uncover other socio-cultural barriers related to the hierarchy of the healthcare system which posed greater challenges whereby midwives preferred to consult their peers rather than midwife coordinators or doctors even when they knew it would be better to contact a doctor for advice. (Chib et al. 2008, 359). It should be noted that gender relations in the health system related to 'occupational stratification' (Hafkin 2002) may also play a role in the latter finding, particularly as midwives, who are predominantly, if not exclusively women, have to deal with doctors who tend to be overwhelmingly men. This model underscores the importance of looking at the range of barriers to ICT use including socio-cultural and gender barriers when assessing an e-Health intervention.

This literature review suggested that we should be looking for the following evidence in e-Health projects:

- analysis of gender and social inequalities and how these may influence people trying to use or benefit from *ICTs* and / or are seeking or providing *healthcare* (including differentiation among various socio-economic categories - i.e. among women differentiated by age, education, location, marital status etc.)
- identification and discussion of both the possibilities of e-Health for various socio-economic groups as well as the barriers, constraints and even threats resulting from the intervention
- collection and analysis of sex disaggregated data
- use of participatory methods, particularly for needs assessments and program design and evaluation.

## Methodology

In this paper, we analyze three IDRC supported projects (see table 1), to look at whether and how they have integrated gender analysis into the projects. A number of e-Health projects funded by IDRC provide examples of good practice for integrating gender considerations in e-Health. All three projects received overall positive external evaluations. We chose these projects for in-depth analysis to see if we could find evidence of gender analysis in the final technical reports and how this linked back to the integration of gender analysis in the project design. Our intention was to draw out examples of good practice that could be applied at the proposal review stage to facilitate better gender integration in future research.

For each project we looked for evidence of gender considerations in key sections of the proposal including 'background'; 'problem and justification'; 'objectives'; 'research questions'; and 'methodology'. We also looked at the technical and evaluation reports for discussions of gender findings and recommendations. Specifically we looked to see whether projects drew on any of the relevant literature we have discussed in the first part of this paper; whether they included specific objectives or research questions concerning gender; whether they collected sex disaggregated data and analyzed factors of inequality that would affect the success or sustainability of the project; and whether they included a situation analysis of gender and social inequalities either in the proposal or in the technical report.

**Table 1: Basic information of the evaluated IDRC e-Health projects**

Project name	Organization	Duration	Regions/Countries
Technology supported distance non-formal training and education in water, sanitation, and hygiene	Molave Development Foundation	2004-2006	Smokey Mountains & Maguinda, Philippines
IT-mediated rural	Centre for	2003-2004	Tamil Nadu, India

women's education and dissemination of health information	Women's Development and Research		
Uganda Health Information Network (UHIN) (Phases I, II, and III and IV)	Satellite	2003-2009	Mbale, Rakai & Manafwa, Uganda

Source: Various IDRC documents and the IDRC website: <http://www.idrc.ca>

From our analysis, we draw particular attention to good practices in these projects. In the discussion section we then analyze a relatively new IDRC-funded research project to address some of its weaknesses by suggesting how our analysis might be applied to new projects.

### **Analysis of selected IDRC projects**

#### *1. Technology Supported Distance Non-formal Training and Education in Water, Sanitation, and Hygiene in the Philippines (WASH Project)*

(Website: [http://www.idrc.ca/en/ev-55758-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-55758-201-1-DO_TOPIC.html) and <http://www.molave.org/>)

The WASH project determined the effectiveness of using ICTs as a tool for teachers and students to teach and learn about water, sanitation and hygiene (WASH) issues. The rationale of this study was to explore the possibilities of using ICTs and distance non-formal education to reach more people to be educated and empowered on issues of health, hygiene, and sanitation. The WASH module included sub-topics on personal hygiene, dengue fever, diarrhea, scabies, typhoid fever and environmental hygiene. It also assessed the changes in the knowledge, attitudes, and behavior of people with regards to proper hygiene and sanitation. The study was undertaken in two areas: one in an urban area using a quasi-experimental method with qualitative and quantitative methods. In the urban site (Smokey Mountain), pre- and post-intervention quizzes within the ICT intervention group and the traditional module comparison group were undertaken. In the rural site (Maguinda), an evaluative design was employed, with a focus on qualitative measures. In both the sites, the intervention—the WASH module—was tested and delivered in a digital, multimedia format in distance education mode. In the urban site, the module was delivered using an intranet server connected to a local area network of computers. In the rural site, the same distance education module was used by adult, non-formal education students using a Multi-Purpose Community Telecentre (MCT) facility with computers linked to a server with a broadband satellite Internet connection.

The study had a gender objective and a participatory research methodology that laid the groundwork for strong gender integration. The development and improvement of the ICT platform involved the whole community and the participatory nature of the project facilitated localization and adaptation of the technology (Molin 2006). The project, due to its focus on sanitation and hygiene, understood the need for incorporating local gender roles and circumstances. It explicitly had the objective of deploying distance education technologies to

empower different socio-economic groups, including women (Molave Foundation 2003). In fact, the project considered gender at different levels, including, ensuring gender balance in recruiting staff, consultants, and volunteers, and developing materials and tools with a focus on gender mainstreaming. Notably the methodology included the collection of sex disaggregated data.

The study explored the level of knowledge and attitude towards WASH issues in the post-intervention stage. The findings reveal that more women increased their knowledge and attitude levels using the ICT method. In terms of knowledge and attitude levels, those women who used ICTs for health information performed better than their male counterparts. The data is presented in the table.

**Table 2: Percentage of students with increased post-intervention quiz scores**

	Traditional		ICT	
	Men	Women	Men	Women
Knowledge	67%	64%	53%	59%
Attitude	25%	45%	44%	55%

Source: Compiled from Ramos (2006).

The findings particularly underscore some notable gendered dimensions of education and health promotion (Ramos 2006). Traditionally, hygiene and sanitation are considered the domain of women. No clear patterns, however, emerged out of the project that reflected these processes. The study revealed that gender roles affected the learning process. Women seemed more interested in the content while men were more concerned with mode of delivery. On the other hand, men are more inclined to be interested in the ICT tools. This is consistent with evidence that women are more likely to explore health information through ICTs than men (Lorence & Park 2007). The study underscored the basic differences in the value attached to computers by men and women. Male participants see computers and the Internet as tools for them to potentially become more employable, while female participants see these as tools for communication, as a way that voices and opinions could be heard. It was also revealed that women’s responsibilities affect their health—for mothers, personal health is sacrificed for household chores.

The WASH project demonstrates a number of good practices for integrating gender into e-Health projects. Principal among these is the inclusion of a research objective or research question focused on understanding gender issues within the project. This was reinforced by their understanding of the problem as a human / social issue and the participatory methodologies employed in the project. The collection and analysis of sex-disaggregated data allowed them to uncover and address different needs for women and men within the project and surfaced the factors of gender and social inequality that influence the project (such as gender roles and responsibilities).

## *2. IT-mediated rural women education and dissemination of health information in Tamil Nadu*

(Website: [http://www.idrc.ca/en/ev-61486-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-61486-201-1-DO_TOPIC.html))

The objective of this project was to design and evaluate an ICT-based platform to address the lack of awareness of health issues among young and middle-aged rural women in Tamil Nadu, India. More specifically, the project aimed at examining the level of awareness of specific health issues among rural women and piloting an ICT-based solution that improves the dissemination of information. The project was carried out in phases. In the first phase, a survey was carried out in 14 villages and five schools to assess the level of health awareness with special reference to prenatal care, postnatal care, and HIV AIDS. ICT tools were developed on the basis of the information gathered. The tools included CD-based training materials and a training and information dissemination software package (Molin 2006, 17). These tools were fine tuned in the second phase before the information was disseminated in the target areas. The research identified pre- and post-natal care and AIDS as important health issues faced by rural women. The two ICT-based information modules on health awareness that were developed during the project received significant positive feedback from participants and the findings indicate that the level of awareness increased (Venkatesan & Bai 2004).

Without specifically articulating a gender objective the researchers demonstrated a rich understanding of gender issues in the 'problem and justification' section of the proposal. Rather than treating women as an undifferentiated category, they note differences among women related to class and caste that led to some girls receiving little or no education. The researchers underscore the importance of power relations in determining women's health stating for example, "Sexuality and power are at the root of most sexual and reproductive health problems. Good health therefore depends in part on having the personal power to negotiate effectively with others not only within intimate relationships but within the institutions of society as a whole" (Renuka 2004).

Although the project focused specifically on women, the findings reveal some interesting gender dimensions. An important issue was the lack of education among women in general. There are severe constraints faced by young girls in accessing education. As all the schools were co-educational, many girls were not allowed to continue with their schooling. This wider social problem was not taken for granted by the researchers who noted in the research proposal "we know that it is the socio-economic and cultural reasons which create the problems for girl children and just using ICT will not solve these issues. But ICT as an information tool as a catalyst has lot of potential to educate and motivate these girls come together to solve their issues and grow as an empowered women"(Renuka 2004). While this project was modest in scope, ICT clearly can play a significant role in distilling worldwide information and disseminating it to a rural audience at a reasonable cost (Dougherty 2006, 62).

The researchers in this project uncovered many of the challenges faced by women in attempting to use and benefit from ICTs which result from gender inequality. Women's responsibilities for contributing to the household income pool affected their opportunities to access ICTs. Many women in the sample actually were reluctant to participate in the dissemination program because they are involved in agricultural work and participating in the dissemination meant that they would lose a day's income (Venkatesan & Bai 2004, 6; also see Timyan et al 1993). Due to the conservative nature of the women in the villages, attracting women to come out in the public was

also a challenge. Both these challenges during the pilot stage suggest long-term sustainability of the program will be challenging. Another outcome of the project was that women expressed the need for raising awareness on reproductive health issues among men as well (Molin 2006; Dougherty 2006; Venkatesan & Bai 2004).

In terms of ICTs, it is apparent that visual learning helped women to better understand the reproductive health issues (Venkatesan & Bai 2004, 6). Using ICTs effectively depends on understanding the strengths and limitations of the technology in a changing information environment (Maxfield 2004). In the case of the Tamil Nadu project, it is seen that two-way communication is highly significant – an interactive process provides better outcomes in terms of content and targeting. Increasing the level of interaction and engagement is really important for marginalized groups like women (Neuhauser & Kreps 2003). It presents new opportunities for women who are typically more affected by health problems but are less likely to be included in the existing channels of communication. Moreover, it was seen that some face-to-face interactions may be a suitable way to introduce ICTs. While more analysis is needed to assess whether health information dissemination through ICTs is effective, ICTs clearly expand the mechanisms of the distribution of health information.

The richness of the discussion of gender inequality in the proposal demonstrated that the researchers had a thorough grasp of gender analysis. Although the project did not include a gender objective, the rich integration of gender analysis into the understanding of the problem was reinforced in the methodology such that it was integrated into the project and reflected in the research findings.

### 3. *Uganda Health Information Network (UHIN)*

(Website: [http://www.idrc.ca/en/ev-117006-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-117006-201-1-DO_TOPIC.html) and <http://www.healthnet.org/>)

This project entitled *Uganda Health Information Network (UHIN)* was undertaken in the Mbale, Rakai and Manafwa regions of Uganda. UHIN used handheld computers to deliver medical information at the point of care. The medical information includes disease treatment guidelines, continuing education materials, newsletters, essential drug lists, and databases. Customized software was used for data collection on handhelds so that the medical workers are able to track patients and keep records electronically. UHIN also used PDAs to provide early warning information about the spread of communicable diseases such as measles or cholera. The information was reviewed by the district health authority and if medicines or support workers are needed they are sent quickly. Three phases of UHIN have been completed so far while a fourth phase is currently ongoing.

An evaluation of the overall project revealed that handheld computers result in more rapid, accurate and cost-effective data collection and reporting (Satellife 2005). Previously it took six months or more to get a response before this system was introduced. The process of data collection, even with the cost of hardware and software was 25% more cost-effective than the previous manual system. UHIN demonstrates that PDAs are a technologically viable, cost-

effective tool to improve communication, information access and data exchange in a low-resource environment.

It seemed, however, that there is a technology bias in the way the PDA was introduced and used in the first three phases. A review of the proposals in all the first three phases indicates that gender issues were not integrated at the design level revealing several missed opportunities to take into consideration gender and socio-cultural factors. Using the framework proposed by Longwe (1991)<sup>1</sup>, Litho (2007) argues that the UHIN project can be considered to be *gender neutral*. Although the project did not specifically target women, women are known to have participated. At the project team level, at least two women doctors were involved. More importantly, the level of decision-making that these female doctors had in the project has not been documented. In terms of capacity building for the project staff, training was offered in some occasions but the documentation indicates that only male staff went for the training (Satellite 2004).

Lack of data on women's participation in the project at the technical and beneficiary levels made gender-based analysis difficult (Litho 2007). Sex disaggregated data would have allowed analysis of the points of access according to gender, attitudes towards ICTs within the health sector, differences in frequency of use by men and women, and importantly, the relationship between gender, access and attitude. Unfortunately, this kind of information is absent in the project outputs of the first three phases.

In the third phase of UHIN, there was recognition in the conclusion of the final technical report of the need for assessing the potential of UHN for empowerment of women. One of the recommendations specifically emphasized inquiring and documenting how diffusion and adoption of UHIN has contributed to overcoming gender-based barriers to ICT access and use and to changes in gender relations and women's empowerment (Satellite 2007, 49).

For the current (fourth) phase of the project from 2007-2009, the proposal is designed to ensure that a gender perspective is integrated into the implementation and research processes and that the resulting interventions contribute to the promotion of gender equality. The proposal presents a clear research strategy and references relevant literature on gender issues in health, development and ICT4D. The proposal outlines two specific activities to explore the gender issues for the implementation of UHIN in this phase (AED 2007, 32-33). First, given that women and men have different reproductive health needs that are affected by both biological distinctions and societal roles, the project seeks to ensure that the health content disseminated to frontline health workers is relevant to the diagnosis and treatment of both female and male reproductive health illnesses. Second, the project seeks to ensure that the intervention will not result in gender inequities and inequalities in terms of women's access to the use of PDAs. An equal number of female and male health workers will be trained in the use of PDAs to ensure that female health workers continue to use UHIN tools to improve their practice. More importantly, the project proposes to use a qualitative study approach using in-depth case studies on adopters of PDAs and other related technologies in the UHIN program, including analysis of gender inequality for both users and producers of health services in relation to the program.

While earlier proposals had little discussion of gender, this fourth phase project suggests that gender integration requires intentional design – specifically an objective or research question and appropriate methodology before gender analysis can happen. The project explicitly proposes to

integrate gender analysis and to explore how the project contributes to changes in gender relations and women's empowerment. While we would suggest that these considerations should be explored more in earlier phases, the commitment of the donor to long-term funding allowed for incremental increases in gender and social analysis as the project developed. This case demonstrates clearly that when projects put a priority on this issue it is reflected in the extent to which it is integrated into key aspects of the project design (i.e. 'problem and justification; objectives; research questions and methodology).

### *Summary*

By systematically reviewing proposals and technical reports for three IDRC projects, we noted a number of good practices related to the design of the projects which are reflected in the quality of gender analysis we saw in the final technical reports. Above all we assert that the most critical factor for addressing gender inequality in e-Health programs is ensuring that gender analysis is *integrated* into the design e-Health initiatives which is characterized by drawing from most (if not all) of the good practices we identified including:

1. Situating the project within the larger context of power relations and gender/social inequalities
2. Including specific gender objectives or research questions
3. Using participatory research methods (that take gender and social differentiation into account)
4. Ensuring the collection of sex-disaggregated data
5. Analyzing data from a gender perspective by connecting project findings with the larger context of gender and social relations.
6. Discussing barriers, challenges and unexpected outcomes in research reports.

With the exception of the Tamil Nadu project, which clearly established gender inequality as a critical influence on the development problem and employed gender analysis as the overall analytical framework, we would suggest, particularly based on the UHIN experience, that for most e-Health projects including specific gender objectives or research questions is an essential step that is supported by the other good practices to yield a rich gender analysis of the intervention.

**Applying the Lessons:** *Community based e-health promotion for safe motherhood: linking community maternal health needs with health services system in Philippines, Pakistan and Indonesia (SMP Project).*

(Website: [http://www.idrc.ca/en/ev-117799-201-1-DO\\_TOPIC.html](http://www.idrc.ca/en/ev-117799-201-1-DO_TOPIC.html) and <http://panacea-ehealth.net/>)

In this section, we apply these lessons to a more recently approved SMP project by looking for examples of each and discussing the implications of their inclusion / exclusion. This is an ongoing research project in three Asian countries testing the use of low-cost ICTs to improve the

effectiveness of safe motherhood programs (SMP). The SMP project is a part of a larger network of e-Health projects called the PAN Asian Collaboration for Evidence-based e-Health Adoption and Application - one of 8 sub-projects in PANACeA and one of two dealing with maternal health. Our keyword search of the PANACeA proposals reflected our keyword search of the 17 IDRC-supported e-Health projects, suggesting that gender integration was uneven for the PANACeA projects. We chose the SMP project for several reasons. First we noted from the literature that maternal health projects can fall short in gender analysis, particularly if it is seen as a 'women's issue' only (Henwood & Hart 2003). Secondly gender showed up in our keyword search for this project but we noted that the discussion was limited to only one or two discrete sections of the proposal. This latter point suggested to us that the project would have problems but shows some potential for improving gender integration without building from the ground up.

The SMP Project is ongoing. Following the submission and approval of the network proposal (which included draft versions of sub-project proposals) the researchers have completed the first phase of research - a six month needs assessment exercise. Final project proposals were revised on the basis of the needs assessment and the full research projects commenced in February, 2009. Our analysis is based on a review of the original proposal; the needs assessment report and the revised proposal.

The multi-country design of the project takes into consideration the ways in which Safe Motherhood programmes are adapted in different countries while testing a common e-Health intervention and evaluating it with a shared methodology. The enhanced SMPs in the Philippines (Women's Health and Safe Motherhood Program 2) Indonesia (Making Pregnancy Safer Program) and Pakistan (Lady Health Workers Program) share common goals which include i) improved quality of services; ii) improved referral; iii) behavioral change intervention; and iv) establishment of sustainable support systems. The e-Health intervention focused on behavioural change interventions. The researchers propose to design and test an SMS-based eBCC (Behavioral Change Communication) initiative with one community in each country receiving information via SMS and control communities in each country receiving the same information using current communication channels (Saligumba et al. 2008b).

According to the revised proposal,

*...behavioral change intervention (BCI) plays a crucial role in promoting safe motherhood programs... BCC ... aims to promote knowledge, attitude, and behavior to its primary beneficiaries to increase demand for and use of safe motherhood services. It also aims to increase popular understanding of the barriers and risks to safe motherhood and communicate desired behavior, and to reduce stigma and exclusion of disadvantage and risk groups. BCC is a stakeholder-driven communication using appropriate media mix consists [sic] of interpersonal and group communication, community participation and radio and print support (Ibid, 4).*

This description of behavioural change intervention suggests that understanding gender relations at the household and within the community would be important for a successful and sustainable intervention and would be integrated into the research design.

The available project documents suggest that the SMP project shows potential for some gender analysis but there are risks for missed opportunities and gender fade. Notably the proposal does not include a specific gender objective. Both versions of the proposal include a section on gender and social considerations which could offer a richly integrated gender analysis. Though it discusses a number of activities and methodological considerations it is a discrete section of the proposal and these ideas are not reflected in other sections of the proposal, particularly in the project objectives and methodology. Unfortunately, the original version suggests that much of the work in this area would be done in the needs assessment phase and it was not addressed in the needs assessment report. While the background section of the needs assessment report emphasizes socio-cultural factors including the role of other family members in decision-making, the needs assessment research does not include much analysis or discussion of socio-cultural influences in the three study areas. The situation analysis does not include a discussion of the literature (from the health or ICTD fields) or primary research that provides details of gender and socio-cultural factors that may influence the project in each of the three sites. This section is unchanged in the second version of the proposal, suggesting it will continue to receive inadequate attention.

The objectives and even the methodology (in both the original version of the proposal and the revised post-needs assessment proposal) suggest that there are opportunities to consider socio-cultural and gender issues but they are not explicitly stated. Presently for example, the emphasis placed on family acceptance and assistance in the proposal and needs assessment background is not reflected in the methodology which uses 'Knowledge Attitude and Practice (KAP) studies involving midwives/TBAs and clients (specified as pregnant women). The opportunity to extend the study to include family members who may play critical roles in decision-making; transportation etc. (including husbands, in-laws etc.) is missed here.

Given that the current objectives allow for a more integrated gender analysis and the methodologies draw from principles and practices of participatory research, the opportunity still exists to modify the data collection and analysis to include more sex disaggregated data and to probe the gender and socio-cultural considerations adequately. At the network level more attention is being given to supporting gender integration in all the projects including mid-course adjustments to project implementation.

Already in the case of Pakistan the researchers have noted a socio-cultural and gender equality factor that could influence the success of the project - namely low literacy of women in the study community. The problem is being addressed by sending the SMS reminders and messages to both Lady Health Workers and husbands of pregnant women (Shariq Khoja, project mentor, personal communication). At present the research does not engage with this issue beyond this 'technical fix' of sending messages to husbands as well. The study would be enriched by using this modification to involve husbands more in the study by including them in the KAP assessments and tracing the lines of communication to see whether women received vital information from both husbands and lady health workers. A discrete section on user participation in the proposal notes that target clientele *may* include husbands but only where cultural factors related to the definition of household decision-makers would result in husbands being registered in the system (Saligumba et al. 2008b). This approach fails to consider that intra-household relations always mediate decision-making which may affect prioritization of

health concerns; transportation and treatment. Uncovering the socio-cultural outcomes (positive and negative) of including husbands in this project would provide stronger evidence for designing effective and sustainable interventions modeled on this program.

The SMP project falls short or fails to address most of the six good practices we have identified. The research team's understanding of the problem, particularly their discussion of family roles and decision-making, implicitly points to the influence of gender relations on the development issue without explicitly discussing gender and social inequality. The lack of a gender specific objective allowed for the gender considerations to remain isolated and therefore they did little to influence the situation analysis or the methodology. Gender inequality could be explored in greater depth if the participatory methods they proposed were modified to take gender and social considerations into account and to ensure that sex-disaggregated data are collected. In combination, these changes would provide the researchers with the theoretical and empirical data required to incorporate a gender analysis.

## **Conclusion**

One of the central issues, which is evident in the literature review and which reverberated throughout the projects findings, is women's capability, or lack thereof, of benefiting from e-Health projects. As suggested in the Tamil Nadu project in India, this results from broader societal inequalities which influence women's level of education, ICT and literacy skills; their decision-making powers; and their allocation of time, labour and resources. These issues highlight the importance of giving adequate attention to power relations. These power relations work at different levels including intra-household as well as work contexts. While in some cases, it is difficult to address the power relations in the households and communities, at a minimum projects should seek to understand these influences and give special attention to ensure that projects do not exacerbate them.

On a substantive level the IDRC projects we discussed here provide evidence of the influence of gender inequality on e-Health interventions. Given their intent to explore these issues the projects uncovered how gender relations within the household and the community affected women's abilities to access and benefit from the projects. We note the importance of establishing this intent in several sections of the project proposal, principally, the 'problem and justification'; 'objectives' and/or 'research questions' and the methodology. Projects should ensure that sex-disaggregated data is systematically collected. We also emphasize that rich gender analysis emerges from participatory and qualitative research methods which can also uncover unintended outcomes or unexpected findings. We also suggest that this cross/multi-disciplinary approach and systemic gender analysis should be applied to other ICT4D domains such as agriculture and rural livelihoods, education and governance.

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## **Annex 1: IDRC e-Health Research Projects approved since 2005**

1. Rwanda Health and Education Information Network (OASIS-RHEIN)
2. Evaluating a Real-Time Bio Surveillance Program : Pilot Project
3. Enhancing Nurses Access for Care Quality and Knowledge through Technology (ENACQKT)
4. Capacity Building in Open Medical Record System (OpenMRS) in Rwanda
5. Pilot Project Using ICTs to Monitor Chagas' Disease in Argentina, Bolivia and Brazil
6. Punto J : a Portal for Youth-to-Youth Education on Health and HIV/AIDS - Phase II
7. Uganda Health Information Network (UHIN) - Phase IV
8. Open Architecture, Standards and Information Systems (OASIS) for Healthcare in Africa
9. PAN Asian Collaboration for Evidence-based e-Health Adoption and Application (PANACeA)
10. Electronic Health Delivery using Open Source Software and Personal Digital Assistants (Argentina and Colombia)
11. Mozambique Health Information Network
12. Mother and Child Health International Research Network
13. Handheld Computers for Malaria Monitoring (Mozambique)
14. Developer Network : Open Source Personal Digital Assistant Software for Health Data Collection
15. Linkage for Education and Research in Nursing (LEARN) : a Caribbean Initiative
16. Telemedicine in Remote Areas of Algeria
17. Uganda Health Information Network - Phase II

1 According to Longwe (1991), a project may be considered gender negative, neutral or positive depending on how many women participate in it: a project is considered be negative if it does not involve women at all; it is neutral if it recognizes women; and positive if it considers women's issues in its design and implementation (quoted in Litho 2007).