HEALTH INFORMATION SYSTEMS FOR PRIMARY HEALTH CARE

Thinking About Participation

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Abstract: Despite the tremendous potential that information systems (IS) provide in supporting primary health care functioning, the design, development and implementation of these systems is a non-trivial task. Stories abound of IS that have failed to provide the promised potential. Conditions of complexity in the primary health system make the task of design, development and use of IS for primary health care, especially in the context of developing countries, a very challenging task. An important step in trying to address this complexity is to enhance participatory processes of various stakeholders in the process. Whilst acknowledging the contribution to research of participatory design in IS, we emphasize the need to reconceptualize the idea of participation in IS design from a human rights perspective. Drawing from our experience in Okhahlamba, South Africa, we discuss four key points of departure from conventional participatory design: the obligatory nature of community involvement; the need to develop capacity for participation; the politics of participation and “non-participation,” and; the need for a multi-level and multi-sectoral approach.

Keywords: Information systems design, participatory design, participation, community based information systems, human rights

1 INTRODUCTION

Primary health care is a crucial element of national health care delivery, especially in developing countries where the majority of the population live in rural areas relying on governmental systems of health care. Primary health care systems are responsible for providing various outreach facilities to the community, for example implementing programs of immunisation and tracking the progress of TB patients. A variety of programs fall under the ambit of primary health care requiring routine reporting of information. In addition to routine monthly information, the primary health care sector needs to also deal with large amounts of extraordinary data arising from, for example, epidemics and deaths that require immediate response and action. Health care workers spend a significant amount of their time engaged in collecting, recording,
storing or transmitting various forms of data. The potential of information and communication technologies (ICT’s) for health care is being increasingly recognized and various developing country governments are in the process of implementing various initiatives ranging from telemedicine to the use of Personal Digital Assistants for data collection to the computerisation of district health information systems (IS). (Bodavala, 2002)

Despite the tremendous potential that ICT’s provide to support the functioning of primary health care stories abound of IS that have failed to provide the promised potential. On their own, ICT’s are not sufficient and many factors contribute to this non-achievement of potential. Organizationally, primary health care systems are very complex, comprised of multiple levels of hierarchy and various vertical health programs (for example malaria and TB). Other aspects of history, geography, culture, infrastructure, inadequate skill levels and pressures of everyday work heighten the complexity of the primary health care sector. The culture of information and communication, whether supported by ICT or not, typically reflects the practice of collecting data and sending it upwards to satisfy the needs of the bureaucracy, rather than to support action at the local level of the sub-district where information is needed most.

These conditions of complexity in the health system make the task of design, development and use of IS a very challenging one. An important step in trying to address this complexity is to enhance participatory processes of various stakeholders in the design, development and use of IS. The restructuring of routine health information systems should involve all key stakeholders in the design process. Experience suggests that systems that are designed by a team of “information experts” without adequate involvement of key stakeholders usually fails to reflect the needs and practical reality of service providers and managers, and does not encourage the ownership of systems (Routine Health Information Network (RHINO), 2001: p.3).

This argument reinforces the findings of more than two decades of research in IS that has emphasized the contribution of participatory processes in the design, development and use of IS in organizations in general. However, approaches to develop these participatory processes have primarily been articulated in settings from western organizations where conditions are quite different from the developing country primary health care situation. The need to develop participatory approaches that takes into account different contexts, processes and situations has been the underlying theme of the recently concluded Participatory Design Conference in Malmo, Sweden (2002).

Our paper seeks to contribute to this call from the participatory design (PD) conference by trying to understand the nature of participatory processes in the design of IS within the South African primary health care system and how these processes can be strengthened. The focus is on information and communication around it rather on the technologies per se that support it and how a community based information system can link with the existing health information system to form a comprehensive district health information system. Through the experience of developing a community information system and using a human rights perspective, the importance of partnership with community members and participation of a multi-levelled and multi-sectoral group is highlighted. Also emphasized is the need to develop capacity of community members to participate and to provide inputs into the system design process.

The rest of this paper is organized in the following manner. In section 2, we provide a brief overview of some key features of research relating to participation and IS, to help place our work in context. Section 3 outlines our research problems and objectives, whilst in section 4 we provide details on the setting and design methods used. In section 5, we share some of our experiences in the participatory processes involved in the design of IS for the primary health care
sector from South Africa. The final section explores the implications towards participatory IS design.

2 PARTICIPATION AND INFORMATION SYSTEMS

Over the years, research in effective IS design has pointed out the important role of “user participation” in the design of effective systems. This body of research has been important to help refocus the previously dominant technical orientation of systems developers, which finds its origin in a dominant computer science tradition, to also include the needs and aspirations of users.

Participatory design research in IS finds its roots in the mid 1970’s in Scandinavia. The first phase of the PD approach was to strengthen the capability of workers to question issues regarding technological changes and threats to the workplace. Thus participation was by a broad based workers group. One example in this phase is the participating unions from the Iron and Metal Workers Union project in Norway (Nygaard, 1979). The second phase also tackled the skills enhancement of certain skilled workers whom were considered important to include in the participatory processes. This phase shifted toward producing technological alternatives designed for skilled workers using participatory prototyping and design techniques, for example in the UTOPIA project (Bjerknes et al., 1987). Moving from the union based projects in what may be labelled as the third phase, the focus was on design and computing in contexts where ethical issues were raised (Bjerknes and Bratteteig, 1995). In summary, the Scandinavian research emphasizes the concerns of politics, distribution of power in the workplace, and how imbalances can be corrected through the participation of the workers.

Outside the Scandinavian tradition the socio-technical action research of Mumford lead to the development of a methodology (ETHICS) for a participative design approach for the introduction of new computer systems. The aim was to assist a representative group of future systems users and technical staff to analyse their own needs and problems and develop solutions to achieve technical, organisational and social objectives. Though the methodology requires time, social skills and the ability to transfer personal knowledge to a group inexperienced in managing change Mumford believes that this approach provides long term benefits. The North America-based Computer Professionals for Social Responsibility has influenced public policy, facilitated conferences and assisted researchers. This group provides a platform for critical voices and politically oriented PD in IS.

By and large, participation of intended users is seen as a precondition for good design and increases the likelihood of integrating the new system into the organisation. However, in all the cases mentioned above there has been limited discussion on related issues such as variations in why and how workers participated, or the degree and type of participation within the organisation. Moving out of the workplace there has been, recently, debates over the involvement of community members who will be served by the health system (Braa, 1996, and Korpela et al., 1998). However, there is still little discussion on the degree and type of participation or how this can be facilitated.

The issue of community participation has been dealt more comprehensively in development projects initiated outside the IS field employing Rapid Rural Appraisal, Participatory Rural Appraisal and more recently Participatory Learning and Action methods. Participation, especially in the context of community, is intricately linked to questions of democracy, power, and control of health services. However, the success of these participatory methodologies in addressing these
issues remains questionable, and various debates are ongoing about how participation at different levels can be effectively facilitated to support development projects (McGee, 2002). However, participatory approaches have until now found very limited application in IS design and development projects. Participatory Learning and Action methods, as well as other participatory techniques, were employed in the IS design in South Africa which is the topic of the next section.

3 RESEARCH PROBLEMS AND OBJECTIVES

The existing health IS in South Africa excludes children and adults that do not access the services at the health facilities (clinics, community centres, mobiles and hospitals). As a result policy and resource decisions made by the district based on that information, further excludes them. With the impact of HIV/AIDS children have increasingly become a more vulnerable and marginalized group. Since protecting and improving the health of the children of the entire district is the aim of the district health system, additional research was conducted on how to develop a community based information system that could support health care of all the districts children. One of the authors of this paper is part of this research effort.

The primary objective of developing a community-based information system is to assist community members in their decision-making regarding the health of their children. On a secondary level it aims to establish interfaces with the formal health facility information system to enable district managers to use information from the whole district to make informed decisions and policy changes. Conceptually this community based information system has been designed to help caregivers and community members to:
- Manage childhood illnesses better and better attain a state of well-being for their children;
- Learn from their, and other peoples, experiences
- Make informed decisions and
- Claim their and their children’s rights by holding duty bearers accountable.

4 RESEARCH SETTING, DESIGN AND METHODS – OKHAHLAMBA, KWAZULU-NATAL, SOUTH AFRICA

To place the case study within a historical perspective, after 1994 the South African government gave top priority to using the primary health care approach in the delivery of health services. In 1997, the national Department of Health adopted a new strategy towards care of children under five years. This strategy, under the label of “Integrated Management of Childhood Illnesses,” had the overall aim to reduce mortality and morbidity due to common diseases, and thus improve the life and welfare of the under five child in South Africa. Part of this strategy involved the development of monitoring and IS to help assist community members in their decision-making and care of their children.

The project under consideration was selected by the national department of health as one of three learning sites for the development of this monitoring and information component. The project is located in Okhahlamba, which is a municipality of the uThukela district lying in KwaZulu Natal on the eastern coast of South Africa. In developing a community monitoring and information system the project relied heavily on its strategies of participation and capacity development.
In November 2001 the review of the health IS (uThukela, 2001) revealed the presence of a relatively strong “data culture” within the health structure in Okhahlamba where the health workers were routinely submitting relatively large quantities of data. This data was collated and presented back to the health facilities and health programmes rapidly and comprehensively in the form of quarterly and annual reports. The data, depicted diagrammatically in Figure 1, summarises the flows from the district to the National levels. A number of the facility staff and department of health officers co-designed the data collection tools and agreed on the minimum data set. A manual system of data collection and collation is in place up to the district level. At the district level the data is entered into the health information systems program (a Microsoft Access and Excel based countrywide software). A similar process was also adopted in other districts developing their health information system, and a degree of flexibility was provided in the system for facilities to include their own additional data items or indicators.

Despite a 100% reported submission rate of monthly routine data from the health facility, we found that the actual use of this data for guiding action to be limited to transferring data (up the hierarchy) rather than its use for analysis and decision-making. Participation and technical skills development have not been sufficient for the effective use of the health IS.

**Figure 1: uThukela District data flows**

The situation is slightly better in the case of the community health workers who collect data in the Okhahlamba municipality on growth faltering, low birth weights, home deliveries and deaths by age and by cause. At monthly meetings, the community health facilitators collate all the data they have received from the community health workers they supervise and send a summary to the district information officer in the form of “district information reports.” The community health workers, with the assistance of the community health facilitators, give feedback on the data they have collected to the community through village health days, where different communication channels including song, dance, pie graphs and bar charts are used. Discussion on the information is held and possible courses of action are identified. A referral system also operates using the data
collected. A community health worker refers caregivers of “at-risk” children to the clinic and informs the clinic of this referral through the use of an “at-risk” register kept at the clinic.

Overall the health care system and also the health IS is still largely “facility-based” rather than “community-focussed”. Only the community health worker data reflects data flowing from outside of the health facilities. Further data collected is rarely used in reflection or action. Based on the review of the health information system and the situational assessment the project staff with the community members felt that there was the need to develop an information system that would address their needs. As part of an action research project run by a local non-governmental organisation the following discussion is based upon research conducted around the development of a community monitoring and information system during June to September 2002 in one municipality in KwaZulu-Natal in South Africa.

5 RESULTS OF RESEARCH AND PROCESS OF SYSTEM DESIGN AND DEVELOPMENT

Based on the situational assessment it was agreed that the first step in designing an information system to support community members to monitor the situation of their children, requires community members to visualise what they wanted to achieve for their children. Community meetings were called and participatory learning appraisals were conducted to reach a common agreement on the objectives of a child health programme. In a subsequent workshop, however, it became evident that very few women who attended this meeting could understand the “codetermined” objectives of the previous meetings. The objectives had to be translated to simple English and then to Zulu before agreement on refined objectives were reached. So even though the objectives were initially agreed to in another community meeting, they were not representative of the views of this particular group, emphasizing the heterogeneous nature of communities.

As the agreed objectives were around the attainment of “holistic health and well-being” for their children, one of the initial challenges of the participatory process was to understand what was meant by a child being in a “state of well-being” from the various groups. Through the various focus group discussions and interviews, definitions for a child “at-risk” and “well-being,” and also the conditions that contributed to these conditions were discussed.

Decisions made depend on the informational base and indicators selected (Sen, 1999). Having agreed on a local term for indicators (izinkomba), we explored how community members would measure “at-risk” and “well-being” and the conditions that lead a child to be in that state. At this stage, we did not attempt to develop precise formulations of indicators, but rather used the discussions to explore broad areas of measurement. This was because community members felt that they were not looking for a value to be placed on childhood vulnerability or risk, but rather there was the need to track changes in this status, to know when action needed to be taken when a child was falling into risk or danger.

In an attempt to design a community based health information system that supported the care of the excluded children in the community a total of 10 interviews, 18 focused group discussions, and one meeting, involving mainly women, were conducted. Participatory methods were employed in order to understand the context (powers, traditions and customs, socio-economic conditions) in which community members live. From a participatory situational analysis and assessment the main people responsible for the delivery of services (the duty bearers) and other
key people in the community (key role players) were identified. If action needed to be taken to improve the care of the children of the community it was felt that these people would need to be involved in the design of an IS. Thus the following groups of people participated in the research: community health workers, clinic health committees, traditional leaders, councilors, social workers, early childhood practitioners, mothers (including teenagers), fathers, grandmothers and uThukela District Child Survival Project (TDCSP, hereafter simply called “the project”) staff. The results from a district health IS review, held in November 2001, along with the results of the participatory situation analysis (June 2000), were also drawn upon for the analysis.

The capacity of the role players and duty bearers to act if they received the necessary information or knowledge was then addressed in the research. Most of the respondents felt that action could be taken given current capacities, and ongoing support, of the health care system, if they received adequate and timely information. It was agreed that much of the data collected through the district health IS is valid and useful. An important requisite was access to the data, as the data was not flowing to people who could take action.

So the research identified that while some data for “at-risk” and “well-being” is currently collected in the district health information system, analysis of the same is not being relayed back to the people responsible for taking action at the household level. So changes in the information flow were recommended as well as changes in the format of the routine district data. It is recommended that the district information officer summarises the data collected on a quarterly basis and sends a summary sheet back to the newly formed community health committees. This summary sheet will be “acted” out, through poetry, song and dance in the quarterly community health meetings.

What also needed to be included in the district health IS were indicators of the context which shapes the status of children, such as good communication between parents and children, love or societal norms and values. This type of data cannot be collected through “facility based” health IS, but needs to be largely articulated from the community. Provisional changes in the data collection tools of the community health workers to include some of these concerns have been made.

In the description above, we have briefly provided some examples to illustrate the nature and form of participatory processes that was undertaken in the design of a community focused health information system. In the next section, we analyze some of the unique aspects of these processes, and its implication for IS design from a human rights perspective.

6 DISCUSSION: A HUMAN RIGHTS PERSPECTIVE - IMPLICATIONS FOR IS DESIGN

Many of these experiences outlined above in Okhahlamba emphasize the implications of adopting a human rights perspective in IS design. Such a perspective is fundamentally different from conventional systems development approaches. It moves beyond a needs based approach of charitable giving or benevolence to an approach that views the child as a subject who has claims on others who are obligated to respect, protect and fulfil these rights. It recognises the existence of duties and obligations. The implication of this shift is that each child has the right to something (rights claimers) and the right against someone (duty bearer).

In IS design, it makes mandatory the development of an information and monitoring system that enables community voices to be heard in terms of their needs, interests, and expectations. In
many ways this is similar to other PD cases which questioned the issue of dominance, but from a workers perspective within an organisation. However a human rights perspective further enables community members to hold government accountable, assess the extent to which public programmes are fulfilling the rights of the child and take action as necessary. A human rights approach entails the adoption of a different perspective on how and what information is viewed. The fundamental difference of this perspective with traditional IS participatory design is the normative stance taken on the fact that it is “obligatory (and not a choice) for people to participate.” So we move beyond the traditional parameters of PD – beyond the workplace where participation is viewed as a precondition for good design leading to increased likelihood of the system being used to the community where we are legally and morally obliged to include the users of the health system.

Development is seen as the growth of people and people live in communities. Communities do not live in isolation and their social constructions and practices are affected by factors and practices outside their control. To take into account the community, by necessity, a multi-levelled multi-sectoral approach is required. Primary health care, as well as IS which support the health system, are part of this development process. So again we depart from conventional PD – moving beyond one organisation to a multi-levelled and multi-sectoral approach.

The design of IS is a social and political process, and participation of different community groups is required to address these power imbalances. For this to happen, capacity to participate and an enabling environment needs to be developed, as do the skills for using information for informed decisions. While access to information is a necessary pre-condition, on its own it is insufficient without the capacity to apply it in meaningful ways. This implies moving away from skill enhancement of workers in conventional PD approaches to detailing the extent and type of participation as well as to broader capacity development.

In summary then the main departure points from conventional PD, based on adopting a human rights perspective as well as from our experiences in South Africa are:

- the obligatory nature of community involvement;
- the need for a multi-level and multi-sectoral approach.
- the politics of participation and “non-participation”, and;
- the need to develop capacity for participation and for developing a climate for learning.

6.1 Obligatory Nature of Community Involvement:

While some authors have argued the need for participatory design in developing countries to emphasise the community rather than the workplace (Braa, 1996; Korpella et al., 1998), we find little of this taking place in practice. However, the South African case strongly emphasises that this need for community participation cannot be ignored, especially when there is an obligatory and normative requirement.

The South African constitution, legislation and policies strongly emphasise that community participation cannot be ignored and is an obligatory and normative requirement. This emphasis has historically been an element since the early days of the Reconstruction and Development Program of the ANC and is enshrined in the constitution and local government legislation. There is the recognition those government service providers and the communities they serve share relevant information and knowledge about the situation, and this should be shared through a process of respectful dialogue between them. Such a process of dialogue can help create a shared vision by fostering equity and shared responsibility.
In South Africa, and many other countries, we often find that the district health IS is primarily a district facility IS. Those who are most vulnerable and excluded, and need the health support systems the greatest, are the very ones not accessing the health services. They are thus further and systematically excluded, as they are not included in the formal IS based on which policies are formed and resources allocated to the community. As seen in the Okhahlamba the context in which a child grows up is important to monitor if action is to take place before a child ends up in “at-risk” situations. Community linkages are essential here. Thus in order to make decisions around the situation of children a community information system needs to link with the health facility IS to form comprehensive district health IS.

6.2 Need for Multi-Level and Multi-Sectoral Participatory Processes:

Key players identified that affect the development of children were: community health workers, parents, family members, early childhood and crèche teachers, home based carers, social workers, health facility staff, community health committees, councillors, Government and external organisations. These players represent both multi-sectoral (health, education, welfare and local government) and multi-levelled (household, community and district) groups. An information system that would then support these key players, and take their interests and concerns into account would necessitate a multi levelled and multi sectoral approach and address the different levels of interdependencies. Conventional PD approaches have explored IS design in one organisation, in some cases even between different hierarchical levels with that organisation, but have rarely analyzed the use of PD between different organisations from different sectors of the economy.

Communication between the department of health and the local authorities is especially important in South Africa. With the move towards the decentralisation of health service delivery (along with other basic social services), to local authorities from the district department of health, a more multi sectoral IS is required. Furthermore the newly established structures, such as the community health committees and community health forums, have meant a renegotiation of roles and responsibilities at the district level. This has implications for new kinds of interests and functions being reflected in the district health IS. This required active communication between the parties involved and their participation in its redesign.

6.3 Politics of “Participation” and “Non-Participation”

The term ‘participation’ has different meanings for different people from building local capacity and self-reliance, also to justify the extension of state control. It has been used to devolve power and decision making away from external agencies, but also to justify external decisions. (Guijt et al., 1998: p.79)

What is important in participation is who decides what data to collect, who collects it, who interprets the information and uses the finding and how participation can make decision-making a more democratic process. Participation in IS design should be a social process of bringing people together to understand different views and share decision-making. In Okhahlamba, the initial step taken was the creation of a common vision for the development of their children. As the key players who affect the situation of children were identified, they were included in the discussions on how the IS could best serve their needs. It is believed that only if the participants felt that the IS could benefit them in their day to day lives would the IS be effectively utilized. Indicators
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were co-designed between the department of health, local government, community members and project staff.

The move towards local authority delivery of basic social services and the creation of new structures meant that many new role players were brought together who previously were not inter-connected. The community health workers had recently moved from the project to the Department of Health and were confused over their reporting structures. The district department of health needs to hand over delivery of health services to local authorities, but the local authority does not have the personnel, the human nor financial capacity to carry out this function. The clinic health committees are enthusiastic to support initiatives that will improve the situation of their children, but have only been recently formed. Data flows do not correspond to the new roles.

Most of the difficulties in terms of participation were over the clarification of new roles and responsibilities. This demonstrates that IS design and development is essentially a process of negotiation, based on the premise that different stakeholders will have varying claims, concerns and issues, which in turn are shaped by the context-specific values of the different stakeholders.

Through the research more people are being made aware of what data is being currently collected and what is of use to them. Through discussions agreements were reached on who should receive what data. These linkages are to be facilitated by, what one project leader described, as a “feedback pathway” of data. There are many of these pathways at different levels, but the one between community health worker, community health committees, health facilities and households is core and is currently absent from the district health information system.

Popular participation is the freedom of people to participate in the processes and influence the decisions that affects them (Sen, 1999). In this case participants were not looking to define absolute values to be placed on childhood “well-being” or “risk”, but rather be sensitive to the need to track changes in this status, to identify when action was needed as a child was seen to run the risk or danger. Chambers makes a similar point when he challenges peoples’ pursuit of excessive accuracy of data when approximations are adequate: “What often matter are judgments of trends and of relative amounts, and insights into causality” (Chambers, 1999: p.41). He urges people to aim for ‘approximate precision’ as well as accepting ‘optimal ignorance’, or knowing only what you need to know. So health IS designed with health facility staff was more indicator driven, but with community members it was more around measuring trends for action. This process of IS design can be seen as developmental when the process serves as a means for communication and participation.

But participation does not necessarily lead to sustainable and effective IS. Health information often focuses on the symptoms of exclusion and oppression, such as diseases and deaths, rather than the causes of the oppression or disempowerment. (Guijt, 1998). This emphasizes the importance of understanding the context in which children live. Conditions that put children at risk need to be understood so that action and decisions to rectify the situation can be made. Support to carry out that action is needed, often involves more than one sector and needs the engagement of different levels in society. The inclusion of indicators on “at-risk” households from newly designed community health workers data collection tools will help monitor this context.

6.4 Developing Capacity to Participate and to Take Decisions:

The ability to claim a right or fulfil duties requires the individual to have the capacity and information to recognize the rights and what needs to be done to achieve it. For actors to
participate in dialogue, there is the need to recognise the structural conditions that are required for such a dialogue to take place, and what are constraints to achieving this. Capacity development is required to overcome these constraints, which goes beyond the skill enhancement addressed by Ehn (1993) and tackles issues of responsibility, knowledge and access to resources (Jonnson, 2000).

Key in this case study was access to information. Becoming part of the current data flow and developing a community level information flow were viewed as fundamental for the capacity to act. Clarification over roles and responsibilities was also an essential element of the process. The recent move to decentralisation of the health services to local government added to this initial confusion. Communication was key in resolving the issues.

Being able to access information and participate in communication systems are crucial for people and organisations in the operation of their individual and collective decision-making cycles. Part of this is the capacity development is the strengthening of a learning process approach, which encourages critical reflection and is linked with action. The learning process is built upon existing community skills and resources and on what people already know and do, such as including existing community structures and meetings in the “feedback pathways”. It was encouraging to see that community level structures felt that they could act if they were connected with the data flows. Time will tell whether by their inclusion they have in fact engaged in critical reflection on the data and information received for the betterment of their children.

7 CONCLUSION

Participation is fundamental to the development of a sustainable IS. However in the area of primary health care, as illustrated in the case study, there are a number of important departures from how participation has been conventionally perceived in the IS field. These are the obligatory nature of community involvement; the need for a multi-level and multi-sectoral approach; the politics of participation and “non-participation”, and the need to develop capacity for participation and for developing a climate for learning. The South African example shows that the obligation of participation as a right necessitates community involvement and that if the community information system is an integral part of that system then we can try to create a shared picture of not only what health services deliverers want to see but also what community members want to be shown.

However action by community members is not without its concerns. There was some fear for the safety of the people who would assist in the identification of households where children were being abused. As one father put it “Neighbours can identify a child at risk although it is difficult because you can be bewitched for pointing out a family”. A project leader also mentioned a case where persons’ live had been threatened if she intervened in a child abuse case.

IS design is a time consuming process. Outreach workers, such as community health workers, are central in developing IS that is culturally sensitive, flexible and used! A further challenge, which is currently being addressed, is how we can realistically move from this one site with community outreach workers to many more sites that do not have any such cadre in their health structures. There is also the need to evaluate the revised district health IS once it has been in place for some time. Do the proposed changes in the data flows, in the format of the information and in the data collection tool ultimately lead to an improved district information system which improves the status of the children of that district?
However, these experiences are not just applicable to other developing countries. They have useful implications for participation in IS design in general. We need to move away from the workplace to the community served by the primary health care services; from participation of workers for improved design to participation as a right; from a vertical health system to a more multi layered and multi sectoral approach, and; from skill enhancement in system design to capacity development which facilitates participation and that addresses the challenges faced within systems and structures of health and related sectors.

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