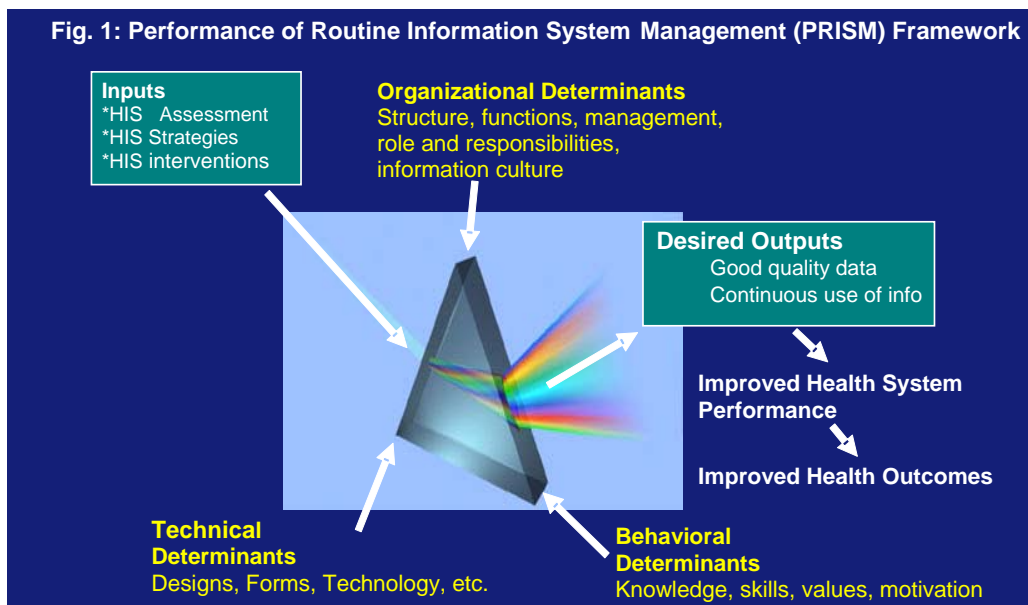


# PRISM Case Studies: Strengthening and Evaluating RHIS

The MEASURE Evaluation Project provides assistance to host-country decision makers in collecting and using data. Routine health information systems (RHIS) <sup>1</sup> are unique among program information sources in that they gather data continually. But in most developing countries, RHIS are weak, produce data of poor quality, and are of limited use in informing decision making. The MEASURE Evaluation Project has developed a conceptual framework to address these weaknesses: the Performance of Routine Information System Management (PRISM) framework (see Fig. 1). PRISM represents a paradigm shift in designing, strengthening, monitoring and evaluating RHIS. First, by gauging performance in terms of improved data quality and continuous information use, it highlights RHIS performance. Second, PRISM places RHIS performance in the context of technical, behavioral and organizational determinants whose relative importance, as measured by PRISM tools, generate possible interventions. And third, it provides a mechanism to assess the role of RHIS in improving health system performance. PRISM is grounded in a systems perspective, focusing on problem solving and continuous improvement.



The case studies presented here (drawn from work in Mexico, South Africa, Uganda and Pakistan) illustrate how PRISM helps design, strengthen, monitor and evaluate RHIS in various settings.

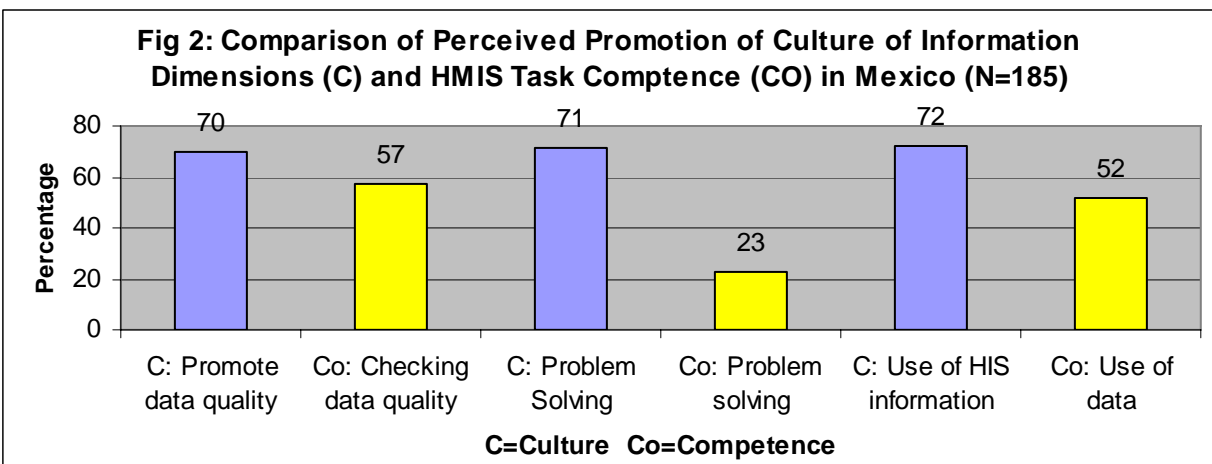
## Mexico HMIS: Promoting a Culture of Information

**Rationale for Using PRISM OBAT:** In Mexico, the Ministry of Health was well-informed about the structure and management of the Mexican HMIS, but sought a deeper understanding of the organizational and behavioral factors affecting data quality and information use.<sup>2</sup> Use of the PRISM Organizational and Behavioral Assessment Tool (OBAT) provided valuable assessments of: a) Promoting a “culture of information”; b) HMIS tasks self-efficacy (confidence level); c) HMIS task competence; d) Knowledge of HMIS purpose and methods of checking data quality.

The PRISM framework assumes that if organizations promote a culture of information, they will also improve their competence in conducting HMIS tasks, and thus improving their self confidence to carry out HMIS tasks. The promotion of a culture of information will be associated with knowing the purpose and methods for checking HMIS data quality. Using OBAT will help identify the HMIS’s organizational and behavioral factors. The Ministry of Health chose OBAT and the Health Matrix Network situational analysis monitoring tool to conduct an HMIS review in 2006.

**Data Collection:** The Mexican Government survey included interviews with district-level (and higher) officials and data coordinators (N=185).

**Analysis of Findings:** The data were analyzed using SPSS software. Selected major findings as described in the OBAT assessment report are shown in Figure 2.



The survey revealed gaps between respondents’ perception of the promotion of a culture of information and their actual competence and knowledge of HMIS tasks. This indicates opportunities to bridge gaps:

On average, 70% of respondents believed strongly that the MOH promotes checking data quality but only 57% of the respondents could describe at least two ways of checking data quality;

On average, 71% of respondents believed strongly that the MOH promotes problem solving skills but only 23% of the respondents demonstrated skills in defining and solving problems;

On average, 72% of respondents believed strongly that the MOH promotes use of HMIS information but only 52% of the respondents showed how to use HMIS information.

**Promoting Information Use:** The OBAT findings were used to strengthen HMIS performance in the following ways:

A website was created permitting all 33 state health departments access to the OBAT questionnaire. The information processed by OBAT is relayed to the national level;

National authorities were able to prioritize interventions and produce a plan for the incoming government to improve information use and decision making at all levels;

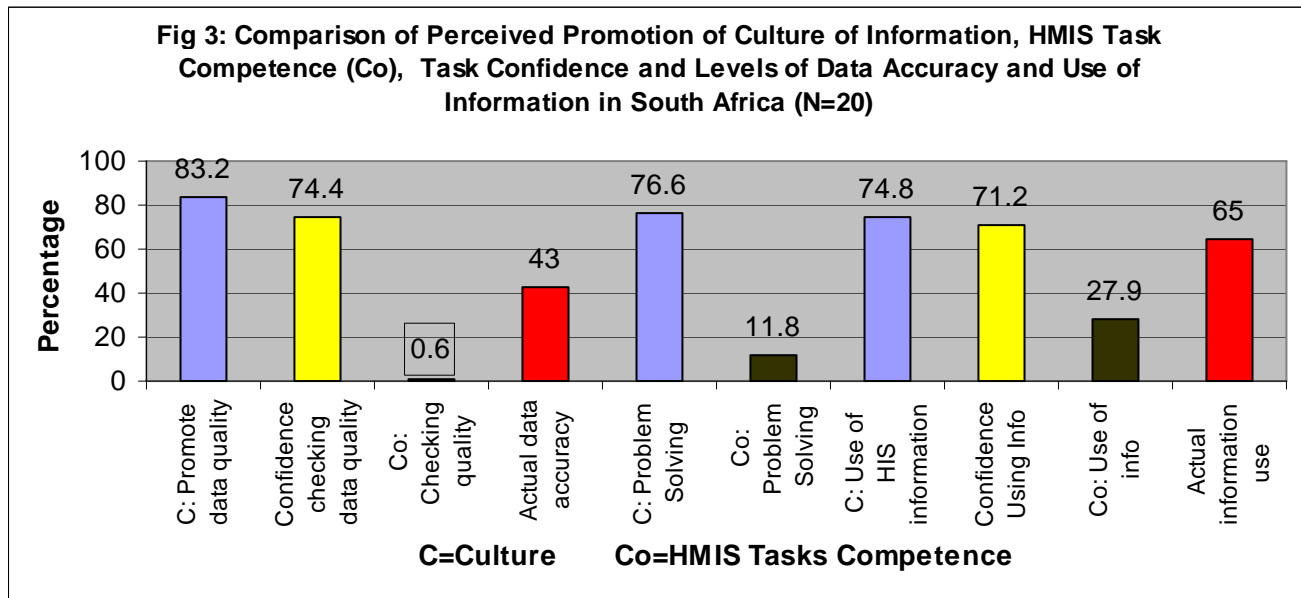
Measuring HMIS performance, based on funding availability, was recognized as important.

## South Africa DHIS: Identifying Performance Level and its Determinants

**Rationale for Using All PRISM Tools:** In South Africa, district officials from two districts sought information about DHIS strengths and weaknesses and allowed South Africa RHIS course participants to assess the performance of the existing District Health Information System (DHIS). The RHIS course was conducted by the University of Pretoria, in collaboration with MEASURE Evaluation, in 2006.<sup>3</sup>

**Data Collection:** Data was collected by 30 participants using all PRISM tools. The PRISM excel sheet was used for data entry and analysis. Twenty facilities in two districts were surveyed.

**Analysis of Findings:** By making comparisons among organizational and behavioral factors and HMIS performance (data quality and information use), the PRISM assessment provided insight into how the different components of the HMIS system are poorly coordinated. Identifying underperformance and its determinants created opportunities for optimizing HMIS performance.



RHIS performance was assessed in two dimensions. The data accuracy was only 43% and the information use level was 65% (Fig 3, red bars).

The PRISM framework relates to underlying determinants of RHIS performance as indicated by the following:

On average, 83%, 76% and 78% of respondents strongly believed the department promotes checking data quality, problem solving and use of information, respectively.

These perceptions were coupled with a perceived high level of confidence in carrying out HMIS tasks:

On average 74%, 77% and 75% of respondents perceived that they had confidence in their ability to check data quality, solve problems, and use information, respectively.

In contrast, only 0.6%, 12% and 28% of the respondents showed HMIS task competence for checking data quality, problem solving and use of information, respectively.

This indicated that major gaps between HMIS performance and its determinants exist (Fig. 3). In addition, both staff and management have a limited understanding of the determinants of poor performance. The PRISM framework highlighted systemic gaps in HMIS function and showed that the responsibility for improved performance rests with senior management and staff at all levels. The need for better coordination and harmony within the different components of RHIS was recognized, as well as the need for better self-assessment tools, better problem-solving skills and continuous improvement.

**Promotion of Information Use:** The information produced under this activity was used to strengthen HMIS performance. Examples include:

Districts made data quality checks a priority;

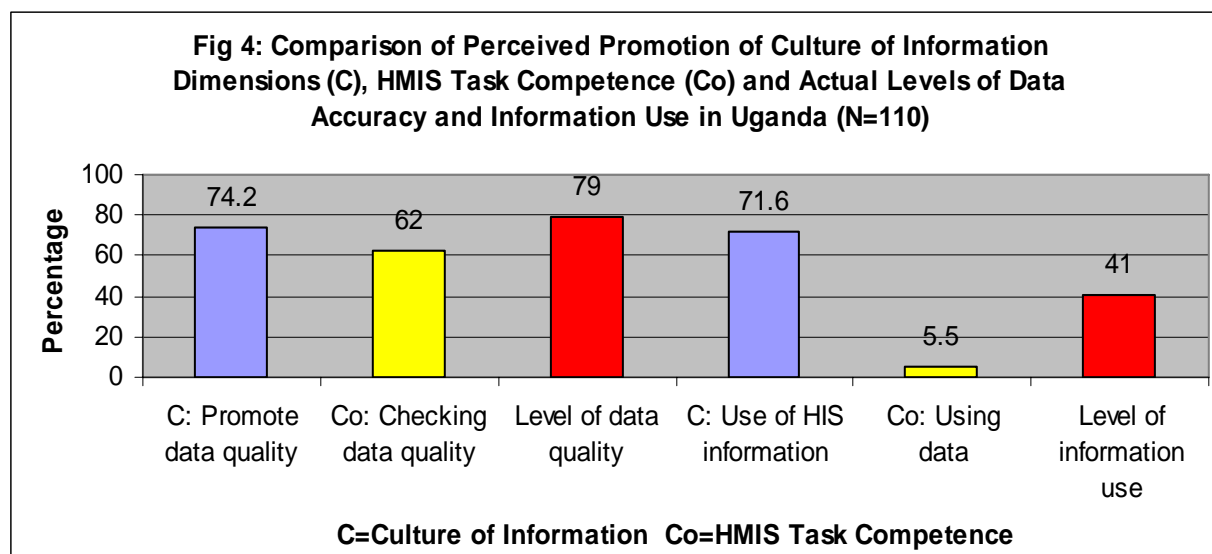
Districts reviewed organizational processes for in-service training and supervision.

## Uganda HMIS: Harmonizing and Integrating HIV/AIDS Information

**Rationale for Using PRISM Tools:** Uganda is one of the few countries where HMIS integrates information from public and private sector health facilities.<sup>4</sup> Even so, HMIS performance, data quality and information usage are limited. The Uganda MOH realized the need to strengthen HMIS for district decentralization as well as to improve HIV/AIDS service information. The latter was only nominally present in HMIS registers or reporting forms. In 2004, the National Health Information Resource Centre (NHIRC) asked the USAID-supported UPHOLD project to support a situation analysis to identify gaps in HMIS performance using the PRISM framework, to explore technical, behavioral and organizational determinants and to document gaps in HIV/AIDS information.

**Data Collection:** An international consultant was hired to assist with conducting the assessment and develop interventions. The PRISM framework was used for conducting the assessment. PRISM tools are generic and need to be adapted to capture specific characteristics and situations. The Ministry of Health wanted to know more about HIV/AIDS and the availability of human resources involved in HMIS activities. The Uganda NHIRC and MOH officials participated in the process of adapting the tools, designing the survey methodology and selecting the surveyors from the government and private organizations. All six regions of Uganda were selected. From each, two UPHOLD project districts were selected. Within districts, health facilities were selected randomly using Lot Quality Assurance Sampling (LQAS). 120 facilities in 12 districts were surveyed. The results were accepted by the Ugandan government and actions were taken.

**Analysis of Findings:** The findings were presented at a meeting in Kampala in late March 2004, where over 50 stakeholders including USAID, WHO, UNAIDS, UNFPA, and other national and international organizations were present. The report was published in mid-2004 and significant findings are shown here.



Under RHIS performance, data accuracy was 79% (Fig. 4). However, if all the missing data is considered as accurate, then the accuracy level decreases to 42%. The level of information use was 41% (Fig. 4). Other indicators of performance were:

- The completion rate was zero: Many sections of monthly reports were not completed by the facilities; and
- The timeliness rate at districts varied between 5% and 91%, indicating that in some districts the facilities were not submitting monthly reports on time while others did not face the same problem.

Some organizational and behavioral factors explaining the low level of HMIS performance were (Fig. 4):

- On average, 74% of the respondents strongly believed that the MOH promotes checking data quality;
- On average, 72% of the respondents strongly believed that the MOH promotes the use of information; and
- 5.5% of the respondents were competent in information use.

An obvious disconnect exists among the categories examined (perception that an organization emphasizes data quality and promotes the use of information, competence in checking data quality and using information), and observed HMIS performance. This indicates that staff and management are unaware that there is a gap between the quality of a culture of information and the ability to complete tasks successfully, which hinders overall HMIS performance.

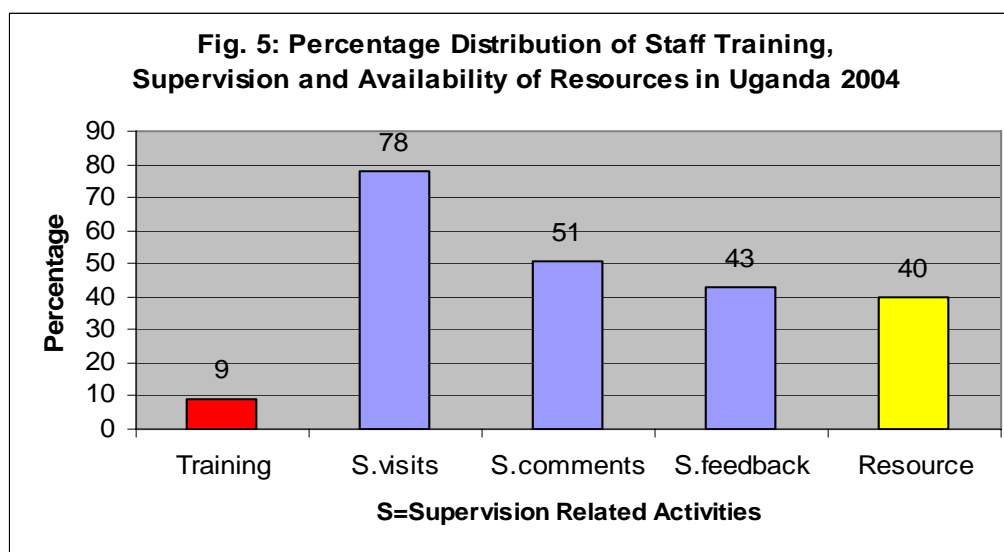
Underperformance is further explained by:

**Training:** Only 9% of the facility staff reported receiving training in HMIS tasks (Fig. 5);

**Supervision:** On average, 78% of health centers in each district reported receiving at least one district supervisory visit in the last 12 months (Fig. 4). However, only 50% of health centers received supervisory comments on their submitted reports, and only 43% of health centers received feedback. These results show the need for improving supervision quality;

**Availability of resources:** 40% of health centers were understaffed. 61% of the health centers visited had some source of electricity. 65% of health centers had functional calculators. The limited availability of human and in-kind resources negatively affected HMIS performance; and

No software program existed at the district level to analyze collected data and generate feedback reports.



Regarding HIV/AIDS services, information was limited to reporting on suspected cases. There was no information collected on HIV/AIDS services such as VCT, PMTCT, etc. Confidentiality training and confidentiality of VCT data were limited.

**Promotion of Information Use:** The findings were used to strengthen HMIS performance. Major examples of steps taken to improve HMIS performance are as follows:

HIV/AIDS service indicators were harmonized, finalized and integrated into revised monthly reporting forms and facility registers. This process was completed in 2005;

Training of facility and district staff (supported by USAID, WHO and other donors) on the revised forms was completed in 56 districts (out of a total of 74) in 2006;

A pilot test of the district software for data entry and analysis (developed by Centers for Disease Control (CDC) and Management Sciences for Health (MSH)) was introduced in seven districts;

A pilot test for transferring data electronically from districts to the National Health Information Resource Centre (NHIRC) was carried out in 30 northern districts with support from DANIDA;

A training manual on HMIS data quality and information use was developed under the UPHOLD project in 2005. It was pre-tested and trainings were held in 2006;

A data accuracy assessment checklist using LQAS was developed for both facility and district offices in 2006 and made part of the UPHOLD project training for six districts offices; and

NHIRC is conducting supportive supervision with the area team that includes checking data quality.

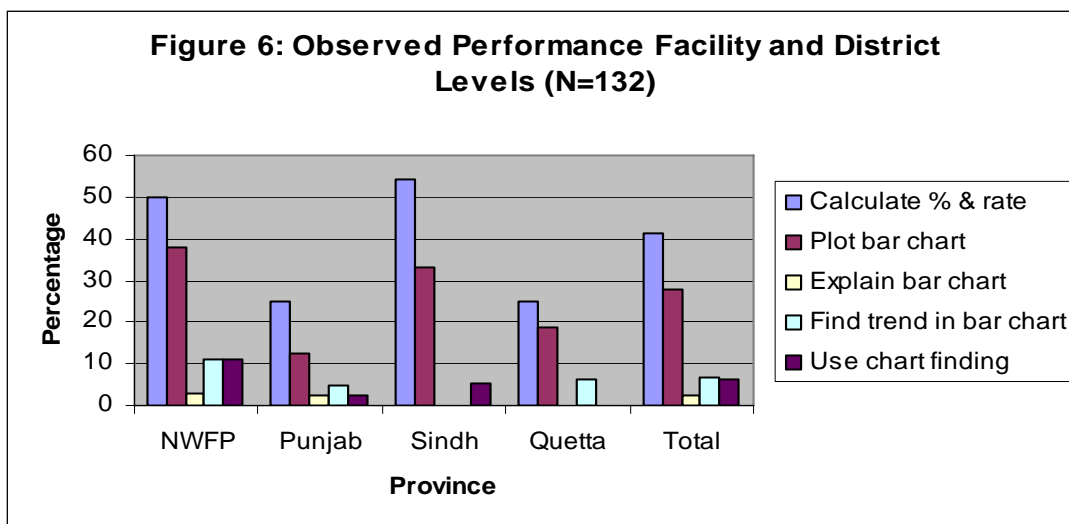
## Pakistan HMIS: Reforming from a Centralized System to a District-Based System

**Rationale for Using PRISM Tools:** The Government of Pakistan wanted to change the pre-existing centralized HMIS system to a district-based one to improve accountability and performance and to expand HMIS to secondary hospitals and the private sector.<sup>5</sup> The Japanese government provided funding and technical assistance. The project was implemented by Scientific System Consultants (SSC), a Japanese firm, and JSI (the HMIS team). They applied the PRISM framework and its tools as part of the study to reform Pakistan's RHIS. The reform process included a baseline assessment, design and pilot testing of the new DHIS and an evaluation of the pilot test to assess feasibility for scale-up.

**Data Collection:** In 2004, the HMIS team conducted a baseline situation analysis using PRISM tools. 135 people in 16 districts from four provinces were surveyed. Key informant interviews were conducted to collect information on management practices and triangulate quantitative data. The PRISM tools were used to identify strengths and weaknesses in the existing HMIS. Through a process of consensus-building with stakeholders at all levels and based on the findings of the assessment study, a reform package was developed and pilot-tested in four districts. The new DHIS extended the HMIS to secondary hospitals and decreased the number of data items in the monthly report from 446 to 131.

**Analysis of Findings:** The pilot DHIS was evaluated after six months, based on the criteria of user-friendliness, satisfaction, time consumption, expansion to secondary hospitals and improvement in data quality and information use. Twelve facilities per pilot district were surveyed and 190 people from facility, district and provincial offices were interviewed.

The baseline assessment showed that HMIS data accuracy (41%) and information use (10%) were limited (Fig. 7). One of the contributing factors was low HMIS task competence (Fig. 6). Less than 42% of the respondents were able to calculate, plot, explain, and find a trend in a bar chart and use those findings for decision making. There was no mechanism for checking data accuracy.

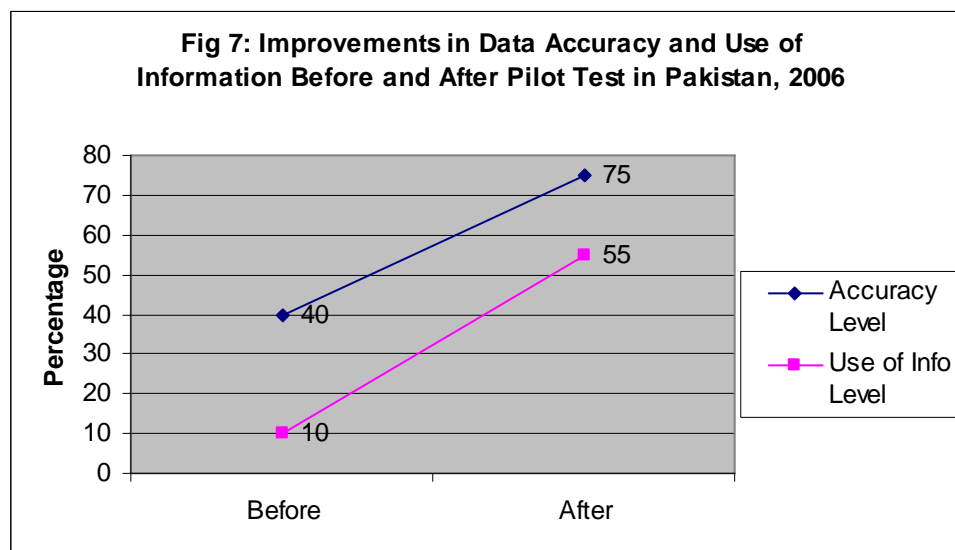


Evaluation of the districts in the pilot test showed that the new DHIS implementation was well-received.

90% of respondents were satisfied with the DHIS design, its tools and the training they received;

HMIS performance improved (Fig. 7). The level of data accuracy before intervention was 40%, which improved to 75% after intervention. Similarly, use of information levels improved from 10% before intervention to 55% after intervention. This could be due to the availability of meeting registers, which facilitated recording of the discussions and decisions during the monthly meeting of the facility staff and district officials;

30% of facilities surveyed applied the new data accuracy checklist for self-assessing their data quality at the facility level. This was a big achievement for initiating a new behavior.



The results of the pilot test evaluation were presented in meetings at federal, provincial and pilot districts for their comments and approval. Between 2004 and 2006, more than 1,000 government officials and stakeholders including members from USAID, WHO, DFID, UNFPA and other national and international organizations participated in meetings about the HMIS reform process and consensus building.

**Promotion of Information Use:** The HMIS reform activity was intended to improve HMIS performance, improving accuracy and use of information for decision-making at the district level and below. Examples of the use of baseline and evaluation findings include:

The development of the DHIS pilot test package included revised data collection forms for primary care facilities and new forms for hospitals as well as tools for continuous improvement of DHIS performance;

An HMIS training manual was developed for the revised data collection registers and forms;

A separate training manual was developed on assessing data quality and use of information for continuous improvement of health system performance;

The HMIS team developed and pilot-tested a district software application for data entry, analysis, and report generation;

During the pilot test, the facilities and the districts conducted monthly performance reviews using DHIS information and recorded decisions on a new DHIS register;

A National Action Plan for scaling-up the DHIS, approved by the government of Pakistan in February 2007, was disseminated in a meeting attended by federal and provincial officials and international donors.

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<sup>1</sup> Routine Health Information Systems (RHIS) and Health Management Information Systems (HMIS) are considered synonyms, both referring to any regular data collection (with an interval of less than one year) in health facilities and their extension in communities.

<sup>2</sup> USAID (2002) A story to tell better health in Latin America and Caribbean. MEASURE Evaluation, “Experiences sharing of Health information Systems in Brazil” a conference organized by MEASURE Evaluation, USAID, Pan American Health Organization 27-28 June, 2006

<sup>3</sup> MEASURE Evaluation, RHIS Course, Pretoria University, South Africa, MEASURE Evaluation,

<sup>4</sup> Aqil, A. (2004) Situation Analysis in HMIS and EMIS, UPHOLD Project, National Information Resource centre, Ministry of Health, USAID.; Mukooyo, E., Orobato, N., Lubaale, Y., Nsabagasni, X., Aqil, A. (2005) Culture of Information and Health Services, Uganda, (2005) Global Health Council Conference June 2005, Washington DC; National Information Resource Centre, “HMIS Procedure Manual 2005”, Ministry of Health, Uganda; Aqil, A. Orobato, N. Azim, T. Hiroshi, A. Hozumi, D. Lippeveld, T. (2005) Determinants of Performance of Routine Health Information System (RHIS): Evidence from Uganda and Pakistan. APHA conference, November 2005

<sup>5</sup> Hozumi, D., Theo Lippeveld, T. Aqil, A., (2002) HMIS Situation analysis Report, MEASURE Evaluation; JICA HMIS Study Team. (2004) “Situation Analysis of Health Information systems,” The study of Improvement of Management Information Systems in Health Sector in Pakistan” JICA/SSC/MOH; JICA HMIS Study Team. (2005) “National Action Plan,” JICA/SSC/MOH.

MEASURE Evaluation strengthens the capacity of host-country programs to collect and use population and health data. We are a key component of the United States Agency for International Development’s (USAID) Monitoring and Evaluation to Assess and Use Results (MEASURE) framework and we promote a continuous cycle of data demand, collection, analysis and utilization to improve population health conditions.

MEASURE Evaluation fosters demand for effective program monitoring and evaluation. We seek to empower our partners as they improve family planning, maternal and child health, nutrition and prevent HIV/AIDS, STDs and other infectious diseases worldwide.

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