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Follow-up Monitoring and Evaluation of Integrated Disease Surveillance and Response in Tanzania

February 2006

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Abstract

Integrated Disease Surveillance and Response (IDSR), a strategy developed by the World Health Organization Regional Office for Africa, has been adopted by the Tanzanian Ministry of Health. The IDSR strategy links community, health facility, district, regional, and national levels in designing and implementing public health interventions for the control and prevention of communicable diseases. Monitoring and evaluating the performance of the surveillance system, using several indicators, is important to improve the effectiveness of strategy implementation. Data are collected, analyzed, and interpreted on a weekly, monthly, or quarterly basis and used to identify areas that require strengthening.

This report presents the findings of follow-up data collection for January–March 2005 in 12 districts representing eight regions of Tanzania. Compared to the October–December 2003 baseline findings, improvements were seen in several areas, including timeliness and completeness of weekly and monthly reporting, district and facility analysis of surveillance data, and use of data for monitoring and planning. Little change was seen in outbreak management, an area in which districts performed quite well both at baseline and at follow-up. Similarly, districts maintained good communication and coordination with other sectors in terms of sharing information and resources to improve surveillance.

The use of case investigation forms during outbreaks improved somewhat, but there is still substantial room for improvement. Outbreak preparedness declined, indicating the need to encourage districts to review and revise existing preparedness plans. While data analysis improved at both the district and facility levels, there is still a long way to go to meet international targets. Timeliness of health facility weekly and monthly IDSR reports to the districts also is still well below targets.

The proportion of districts that knew about the IDSR indicators increased dramatically, from 17 percent to 75 percent, and almost half of the districts provided evidence that they had used their IDSR indicators to take action. This suggests that the foundation has been laid for continued use of data to improve IDSR system performance. Monitoring and evaluation and support of the IDSR program will be required to ensure continued improvement.

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Acronyms

AFP	Acute Flaccid Paralysis
CCHP	Comprehensive Council Health Plan
CFR	Case Fatality Rate
CHMT	Council (District) Health Management Team
CIF	Case Investigation Form
EPI	Expanded Program on Immunizations
IDSR	Integrated Disease Surveillance and Response
NIMR	National Institute for Medical Research
NNT	Neonatal Tetanus
M&E	Monitoring and Evaluation
MOH	Ministry of Health
MTUHA	*Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya* (Health Management Information System)
PHR*plus*	Partners for Health Reform*plus*
WHO/AFRO	World Health Organization/Regional Office for Africa
USAID	United States Agency for International Development

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Executive Summary

Integrated Disease Surveillance and Response (IDSR) is a strategy developed by the World Health Organization Regional Office for Africa (WHO/AFRO) in 1998. Its aim is to assist health workers to detect and respond to diseases of epidemic potential, those of public health importance, and those targeted for eradication and/or elimination. The information collected through this strategy helps health teams to respond quickly to outbreaks, set priorities, plan interventions, and mobilize and allocate resources.

The Tanzanian Ministry of Health has adopted this strategy for strengthening communicable disease surveillance and response. The Partners for Health Reform*plus* Project (PHR*plus*) and the Tanzanian National Institute for Medical Research (NIMR) worked together during 2002-2005 to support the ministry's implementation of the IDSR strategy in 12 districts throughout the country. A baseline assessment was carried out in early 2004 (for the October–December 2003 quarter), followed by this second round of data collection in May and June 2005 (for January–March 2005). In both rounds, data collection was done in all 12 districts, and at the health facility level a sampling framework was developed that included one hospital, two health centers, and 15 percent of dispensaries for each district. A total of 109 health facilities were visited for each round of data collection. Four main mechanisms were used to collect the required data: record reviews, group interviews, an individual survey of attitudes and motivation, and an assessment of IDSR knowledge and skills (final round only).

This follow-up monitoring and evaluation exercise revealed a number of areas in which the IDSR system was performing well, and identified others that required strengthening. Positive performance was noted in the following areas:

- **Reporting:** Timeliness and completeness of weekly and monthly reports increased substantially at follow-up, with a few districts exceeding performance targets and most steadily approaching these targets. However, a few districts continued to lag behind, and additional efforts will be needed to assist them to improve. Accuracy of reported cases (based on an audit of patient registers) improved for all diseases at follow-up.

- **Outbreak management:** As in the baseline, overall outbreak management performance was strong, as this is the component of IDSR that is most familiar to district health management teams. Overall performance remained fairly similar from the baseline to the follow-up period.

- **Planning and monitoring based on data:** All districts reported having used data to plan and monitor, and were able to provide examples. The challenge now will be to continue working to improve accuracy, timeliness, and completeness of IDSR data so that districts can be confident that they are using high quality data in their planning and monitoring processes.

- **Linkages within and outside the health sector:** Districts continued to perform quite strongly in coordinating and communicating with partners and stakeholders.

Areas for strengthening and improvement include the following:

- **Case investigation forms:** Compared to baseline, use of case investigation forms improved; however, there is still substantial room for improvement in this area.

- **Data analysis at districts and facilities:** The proportion of facilities and districts doing recommended analyses (monthly and long-term malaria trends for cases in children under the age of five years) improved dramatically from low baseline figures. However, most districts and facilities are still not conducting regular analyses. Further attention to strengthening facility and district level capacity in data analysis and use is required.

- **Outbreak preparedness:** Overall scores for the elements of outbreak preparedness declined from baseline levels. This may reflect the fact that the project conducted epidemic preparedness workshops in all districts before the baseline monitoring and evaluation exercise, but there was no specific follow-up in this area.

- **Outbreak management:** Despite strong performance overall in outbreak management, there were a few discrepancies between regions and districts in terms of their records of whether any outbreaks had occurred during the previous quarter.

- **Case management during outbreaks:** High case fatality rates for cholera and meningitis suggest the need for improvement of case management for these diseases. However, it should be noted that these data are based on a relatively small number of cases and outbreaks during the time period of interest.

- **Feedback:** Feedback from the regions to the districts actually declined from baseline levels, feedback from districts to facilities improved very slightly, and feedback from facilities to communities declined slightly. Feedback is an essential tool to help encourage and maintain reporting, and thus its improvement is required to continue to improve IDSR system performance.

Results from this follow-up monitoring and evaluation activity have provided useful information regarding current weaknesses and strengths of the IDSR system in 12 districts of Tanzania. The project's interventions in the areas of training, follow-up/supportive supervision, and introduction of tools and job aids contributed to improvements in several aspects of IDSR performance. However, while comparisons with baseline measurements demonstrated significant positive changes in these areas, there are many additional elements that will require additional support to meet performance targets. Ongoing support over a longer period of time is needed to ensure that health workers and health management teams are able to continue to utilize the skills and tools they have acquired. In addition, districts require support to continue to monitor and subsequently strengthen their own IDSR performance. The national and regional levels will be instrumental in ensuring the continuation of monitoring and IDSR strengthening throughout the project districts as well as in other districts in Tanzania.

1. Introduction

1.1 Background of IDSR in Tanzania

Integrated Disease Surveillance and Response (IDSR) is a strategy that was developed by the World Health Organization Regional Office for Africa (WHO/AFRO) in 1998. It is aimed to assist health workers to detect and respond to diseases of epidemic potential, diseases of public health importance, and diseases targeted for eradication and/or elimination. The information collected through this strategy will help health teams to respond quickly to outbreaks, set priorities, plan interventions, and mobilize and allocate resources. The IDSR strategy links community, health facility, district, regional, national, and cross-national levels with the overall objective of providing epidemiological evidence for use in making decisions and implementing public health interventions for the control and prevention of communicable diseases.

Tanzania has been a leader among African countries to adopt the IDSR strategy, being the first to conduct an assessment and develop a plan of action in 1998. This was followed by the development of a work plan for integrating and strengthening disease surveillance (1999), establishment of an IDSR Task Force (2000), preparation of the National Guidelines for Integrated Disease Surveillance and Response[1] (2001), development of laboratory-networking guidelines (2001), and adaptation and approval of the WHO/AFRO district analysis book (2002). The National Guidelines for IDSR focus on 13 priority diseases, which are listed in Table 1.

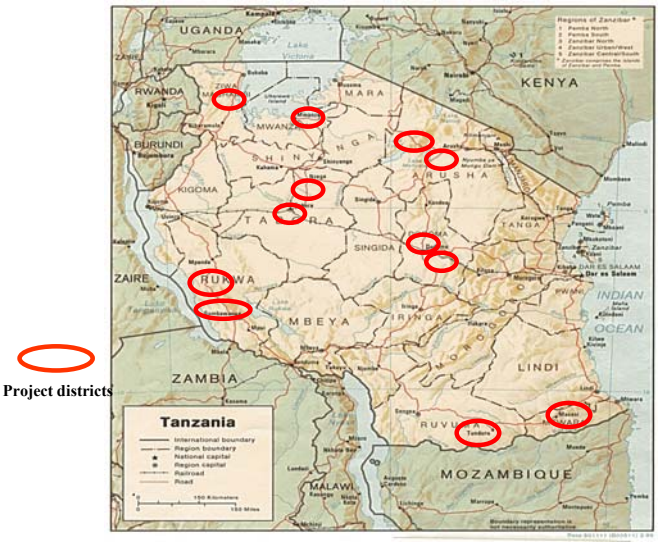
Table 1: List of Priority Diseases in Tanzania

Epidemic-prone diseases	Cholera
	Bacillary dysentery
	Plague
	Measles
	Yellow fever
	Cerebro-spinal meningitis
	Rabies / animal bite
Diseases targeted for elimination / eradication	Acute flaccid paralysis
	Neonatal tetanus
Diseases of public health importance	Diarrhea in children < 5 years
	Pneumonia in children < 5 years
	Malaria
	Typhoid fever

[1] Epidemiology and Disease Control Section, Ministry of Health, Tanzania. September 2001. *National Guidelines for Integrated Disease Surveillance and Response*. Dar-es-Salaam.

The U.S. Agency for International Development (USAID) supported the Ministry of Health's (MOH's) efforts by providing technical support through the Partners for Health Reform*plus* (PHR*plus*) project and its local implementing agency, the National Institute for Medical Research (NIMR). This IDSR project was a three-year activity (2002-2005) focusing on 12 districts[2] around the country. USAID also provided technical support for IDSR activities through the CHANGE Project to address behavior change issues, and through the U.S. Centers for Disease Control and Prevention for strengthening linkages with laboratories.

Figure 1: Map of Tanzania with IDSR Project Districts



The IDSR project was designed to help strengthen a flexible and sustainable disease surveillance and response system focused at the district level. This project built capacity to provide needed information for the execution of prompt, evidence-based disease control and prevention decisions and actions that reduce disease burden and promote the efficient use of human and material resources. The efforts in the project's 12 districts were designed to facilitate the implementation of the IDSR strategy to strengthen surveillance and response in the other districts of Tanzania (by developing and testing tools and approaches for eventual scale-up), and to provide useful experiences to share with other countries. Project implementation focused on mechanisms for improving data quality and increasing data availability, improving evidence-based decision making and response, and reinforcing an organizational culture in which there is a demand for information as the basis of decision making and where stakeholders value information enough to ensure its quality and use.

Monitoring and evaluation (M&E) of the project's implementation was an important component to ensure that the project accomplished its goals. This report focuses on the final M&E activities carried out after the 12 project districts had received a series of interventions designed to strengthen IDSR. Some of the indicators discussed were primarily for the project's use, but many can and should be used by the facilities, districts, and regions themselves to continually monitor the performance of the IDSR system.

[2] These 12 districts represent all six MOH zones, and eight of the 21 regions. The districts are: Babati, Mbulu, Dodoma Rural, Mpwapwa, Masasi, Tunduru, Nkasi, Sumbawanga Rural, Igunga, Tabora Urban, Muleba, and Mwanza City.

1.2 Purpose of Data Collection

The purpose of this data collection activity was to gather specific information on final performance of IDSR systems in each of the districts in which NIMR/PHR*plus* intervened, and to compare these results with the baseline M&E assessment conducted in 2004. The most recently completed quarter, January through March 2005, was used as the reference period for data collection.

2. Monitoring and Evaluation of IDSR: Indicators of Performance

Monitoring and evaluating the performance of the surveillance system is important in order to improve the effectiveness of strategy implementation. The data that are collected, analyzed, and interpreted on a weekly, monthly, or quarterly basis by facility and district staff can be used to monitor surveillance system functioning and thereby identify areas that require strengthening so that appropriate action can be taken.

The performance areas that are targeted for monitoring here fall into four general categories: reporting, use of surveillance data, outbreak management, and management of the IDSR system. A total of 33 indicators were developed to cover these categories at the regional (subnational), district, and health facility levels. These include the eight core indicators proposed by the World Health Organization Regional Office for Africa IDSR Task Force for monitoring the progress of IDSR implementation in the African region, which are focused on the district level and are being used for self-monitoring by several countries. A number of the indicators measured here also correspond to those found in the Tanzania National Guidelines for IDSR, although this document includes several disease-specific indicators as well.

Table 2 summarizes the indicators measured by this data collection activity, with the indicators proposed by WHO/AFRO indicated in italics. In some cases, the WHO/AFRO indicator is only one element of a composite indicator. For example, assessment of the appropriate investigation of suspected outbreaks includes the WHO/AFRO indicator on timely notification of a suspected outbreak to the district, in addition to other indicators. A complete list of indicators, including numerator, denominator, and source information, is included in Annex A. The details of each indicator will be further explained in the Results section.

Districts are expected to monitor a subset of these indicators, including all of the WHO/AFRO indicators noted in the table for the district level, and the use of case investigation forms. District staff were oriented to these indicators and provided with tools to assist in their collection and monitoring during IDSR training conducted by the project.

Table 2: Summary of IDSR Indicators

	Region	District	Facility
Reporting	▲ Accuracy of district reports to region ▲ *Timeliness of weekly and monthly district reporting to the region* ▲ *Completeness of weekly and monthly district reporting to the region*	▲ *Timeliness of weekly and monthly health facility reporting to the district* ▲ *Completeness of weekly and monthly health facility reporting to the district* ▲ Reporting of priority diseases using case-investigation forms	▲ Accuracy of facility reports to district

Use of Surveillance Data	▲ Surveillance monitoring	▲ *Routine analysis of data* ▲ Surveillance monitoring ▲ Planning and monitoring based on data	▲ *Routine analysis of data*
Outbreak Management	▲ Investigation of and response to outbreaks	▲ *Appropriate investigation of suspected outbreaks* ▲ *Effective laboratory confirmation process* ▲ *Appropriate response to confirmed outbreaks* ▲ Outbreak preparedness ▲ Evaluation of outbreak management ▲ *Quality of case management (case fatality rate)*	
Management of IDSR System	▲ Feedback to regions from MOH	▲ Feedback to districts from region ▲ Communication and coordination within and outside the health sector ▲ IDSR activity planning ▲ Implementation of IDSR activities	▲ Feedback to facilities from districts ▲ Availability of tools/job aids as per IDSR guidelines ▲ Health worker knowledge and skills on IDSR* ▲ Health worker attitudes toward performing IDSR tasks ▲ Feedback to communities on IDSR

Note: Indicators prposed by WHO/AFRO are in italics.

* The indicator on health worker knowledge and skills was initially measured during training pre- and post-tests, with final data collected using the same instruments during this exercise.

3. Methodology

3.1 Sampling and Site Selection

The purpose of the monitoring and evaluation activity was to assess system performance before and after project interventions. The baseline and final data were collected in all eight regions and 12 districts in which the project intervened (Table 3).

Table 3: Regions and Districts Participating in Data Collection

Regions	Districts
Dodoma	Dodoma Rural
	Mpwapwa
Kagera	Muleba
Manyara*	Babati
	Mbulu
Mtwara	Masasi
Mwanza	Mwanza City
Rukwa	Nkasi
	Sumbawanga Rural
Ruvuma	Tunduru
Tabora	Tabora Urban
	Igunga

* It should be noted that, at the time of the baseline data collection, Manyara was a newly established region and some functions were still being carried out by Arusha region.

At the health facility level, a sampling framework was developed that included one hospital, two health centers, and 15 percent of dispensaries for each district. As Table 4 shows, a total of 109 health facilities were visited. To facilitate comparison, the same facilities were visited for the baseline and the final rounds of data collection. Within each district, the selection of health facilities was made on a convenience basis with an effort to make the sample as representative as possible in terms of facility location, size, performance, and ownership (government/private), taking into consideration time and transport constraints. For example, a dispensary might be selected that was in the same general direction as a health center so that half of the data collection team could be dropped off at one site while the others continued to the second site. In districts where travel was constrained (by flooded roads, rivers, mountains, etc.), the selection of health centers and dispensaries was truly random. Annex B presents a list of health facilities visited in each district.

Table 4: Sample of Health Facilities

District	Hospital	Health Centers	Dispensaries	TOTAL
Babati	1	2	5	8
Dodoma Rural	1	2	10	13
Igunga	1	2	4	7
Masasi	1	2	7	10
Mbulu	1	2	4	7
Mpwapwa	1	2	6	9
Muleba	1	2	4	7
Mwanza City	1	2	9	12
Nkasi	1	2	4	7
Sumbawanga Rural	0*	2	10	12
Tabora Urban	1	2	6	9
Tunduru	1	2	5	8
TOTAL	12	24	74	109

* Sumbawanga Rural district does not have a hospital.

3.2 Instruments

Three main mechanisms were used to collect the required data:

- *Record review:* The following records found at the various levels were reviewed:

  District: Weekly and monthly surveillance reports submitted by all health facilities for the period January–March 2005, report tracking tools, case investigation forms (CIFs), outbreak reports, results of data analysis, epidemic preparedness plans, meeting minutes, schedules and reports for health education and other activities, and Comprehensive Council Health Plans (CCHPs).

  Facility: Patient registers, copies of weekly and monthly reports for January–March 2005, results of data analysis, schedules and reports for community outreach activities, CIFs, and standard case definitions.

  Region: Weekly and monthly reports submitted by all districts in the region for January–March 2005, report tracking tools.

- *Group interviews* were organized to gather information about activities related to IDSR that had occurred during the quarter. The group format was used because the purpose was not to evaluate individual performance, but rather to assess IDSR activities as a whole. Participants were often asked to provide examples to support their responses. This served as a means of verifying that the question had been understood and an attempt to ensure the validity of the responses provided, rather than just relying on yes/no answers. Participation at each level was as follows:

  District: Key members of the council (district) health management teams (CHMTs), include the district medical officer, the district health officer, who in some of the districts also served as the IDSR focal person, the MTUHA (health management information system) focal person, the Expanded Program on Immunization (EPI) focal person, and others involved in

IDSR. In areas where the IDSR focal person was someone other than the district health officer, this person was also included in the interview.

Facility: At dispensaries, the in-charge and one other staff person; at health centers and hospitals, the in-charge and other staff working on IDSR.

Region: Key members of the regional health management team, generally the regional medical officer, regional health officer, IDSR focal person, MTUHA focal person, and EPI focal person.

Laboratory: When an outbreak had been reported and specimens collected, brief interviews were also conducted at the receiving laboratory to obtain information about dates on which specimens were received, quality of specimens, and test results.

- *Self-administered questionnaires*

  A survey on health worker attitudes and motivation relative to their IDSR tasks was administered at the health facility level (to the facility in-charge and one other staff member). The survey addressed worker job satisfaction, difficulties encountered, assets that helped with ability to perform IDSR-related tasks, and opinions and feedback. The questionnaire consisted of a series of statements and respondents marked their response to these statements according to their level of satisfaction or agreement using a scale (for example: strongly disagree, disagree, agree, or strongly agree). The instrument was translated into Kiswahili so that it could be self-administered.

  The final monitoring and evaluation exercise also included an assessment of IDSR knowledge and skills at both the district and facility levels. The tools were the same as those used for pre- and post-testing during IDSR training at each level. The purpose was to measure retention following the training, and to identify areas that require further strengthening.

For the final round of M&E data collection, the baseline data collection instruments, with minor modifications, were used.

3.3 Data Collection

The data collection teams were composed of 15 data collectors recruited from various NIMR centers and stations. All were experienced in data collection and familiar with the functioning of the health system at the district level; three of them had also worked on the baseline exercise. The group was organized into five teams, each covering two to four districts. PHR*plus* team members were present for the first few weeks of data collection to provide technical support as issues arose in the field.

On average, the data collection teams spent five days in each district (a few days more for larger districts): one to two days at the district health office and the rest visiting the various health facilities. Data collectors provided feedback to each health facility on the results of the M&E and often discussed suggestions for improvement. At the end of data collection in a district, a debriefing meeting was also held with members of the CHMT to discuss facility and district results. This often included suggestions for improving data management and many participants expressed appreciation for this immediate feedback. Data collection at the corresponding region for each district took approximately two hours and generally occurred after the district visits.

3.4 Data Entry and Analysis

Data entry and check files were prepared in Epi Info (v. 6, Centers for Disease Control and Prevention, Atlanta, GA, USA) for the interview and report accuracy data collection instruments. Data from the record reviews were entered into Microsoft Excel spreadsheets. A NIMR data entry clerk entered the data for all of the facility-level instruments, with double data entry done for the accuracy instruments, as check files were not possible for these. PHR*plus* team members managed data entry for the district and regional instruments. The data were then transferred to Stata (v.7, StataCorp, College Station, TX, USA). Frequency distributions were calculated for all variables and the results were reviewed to detect discrepancies and values out of expected ranges. The master database was then cleaned and analyzed using conventional statistical methods. Analysis methods for specific indicators are described below:

- **Report accuracy, district to region:** One month from the period reviewed was selected (this was generally March, the month of the most recent report) and the data from all facility reports for that month were tallied. These totals were compared to the report that the district had submitted to the region for that month. Reports were evaluated for overall accuracy as well as by disease.

- **Report accuracy, facility to district:** The same process was used for facility reports, with one monthly report from the quarter selected for each health facility included in the sample. March was the target month for this review, but if the facility had not submitted a report for March another month during the reporting period was selected. The data from this report were copied and, during the health facility visit, patient registers were reviewed and cases tallied, with the results compared to the report submitted to the district. A 5 percent margin of error was allowed to account for possible error on the part of data collectors, particularly for the conditions with a high number of cases (such as malaria).

- **Case fatality rates (CFRs):** The numbers of cases and deaths in the district were taken from all of the facility weekly surveillance reports found at the district for the quarter.

- **Use of CIFs:** The number of forms for each disease found at the district for the quarter served as the numerator. The weekly facility reports provided the number of cases (denominator) for each disease.

4. Results and Observations

The following sections present the results of the follow-up data collection activities, organized according to the four general categories and indicators explained in Section 2. Where possible, comparisons with baseline findings are presented. Summary tables of results by region, district, and facility level are found in Annex C.

4.1 Reporting

Complete, timely, and accurate reporting is the foundation of a country's surveillance system. This section describes the use of weekly and monthly surveillance reports, which are completed at health facilities and compiled at the district, regional, and national levels, as well as case investigation forms.

4.1.1 Completeness and Timeliness of Surveillance Reporting

Completeness and timeliness are key indicators of reporting performance. These are defined as the proportion of expected reports received (completeness), and the proportion of expected reports received on time (timeliness). Reports were considered late if they had not been received by the established deadline. For the baseline, reports received after the deadlines and those for which timeliness could not be assessed were grouped together as "late." For the follow-up data collection, a new coding category was used to indicate reports that had been received but for which timeliness had not been noted, and analysis of this is included below. Calculation of completeness of reporting included all of the reports received late and on time. Only when a district has received reports from all facilities on the expected date can it be confident about knowing the true disease situation and make decisions accordingly.

Different deadlines were found in the districts for monthly and weekly reports. Table 5 shows that in several cases deadlines even varied among districts within the same region, particularly for monthly reports. Kagera region stated that their deadline to receive monthly reports from districts was the fourth day of the following month, but Muleba district (whose reports go to Kagera region) do not expect to receive facility reports until the fifth day of the following month, a notable inconsistency.

All districts noted that they had a system for compiling information on the weekly and monthly reports that they receive, as did the majority of the regions (Tabora Urban did not). All districts and regions also reported that they noted the date that reports were received, with nine districts and three regions marking the date on the reports, seven districts and two regions using a logbook, and seven districts and two regions using a computerized system to monitor facility reporting. A small proportion of facility reports (1-6 percent) were not assessed each week; these reports came from five districts. Muleba and Mwanza were the two districts with consistently high proportions of weekly reports not assessed for timeliness (18 percent and 15 percent on average each week, respectively).

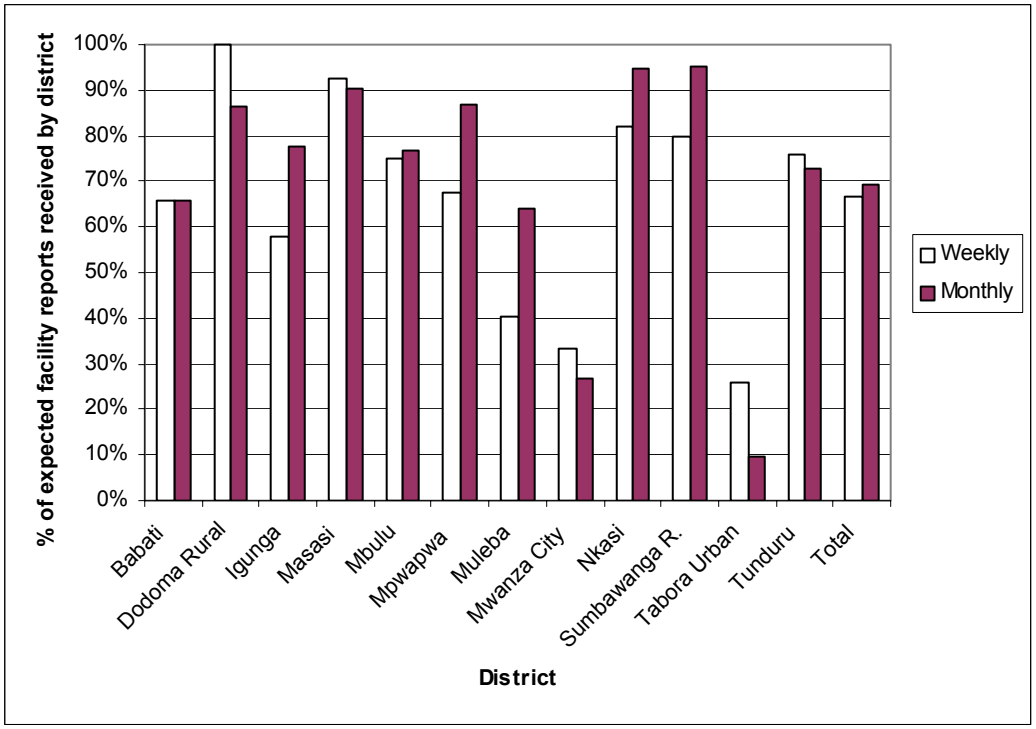
Table 5: Reporting Deadlines in Districts and Regions

Regions	Districts	Weekly deadline facilities to district	Weekly deadline districts to region	Monthly deadline facilities to district	Monthly deadline districts to region
Dodoma	Dodoma Rural	Thursday	Friday	5th	15th
	Mpwapwa	Wednesday		10th	
Kagera	Muleba	Wednesday	Thursday	5th	4th
Manyara	Babati	Wednesday	Thursday	10th	10th
	Mbulu	Wednesday		5th	
Mtwara	Masasi	Wednesday	Thursday	13th	-
Mwanza	Mwanza City	Thursday	Thursday	5th	15th
Rukwa	Nkasi	Wednesday	Thursday	10th	15th
	Sumbawanga Rural	Wednesday		13th	
Ruvuma	Tunduru	Wednesday	Thursday	10th	15th
Tabora	Tabora Urban	Thursday	Thursday	-	15th
	Igunga	Thursday		15th	

4.1.1.1 Completeness

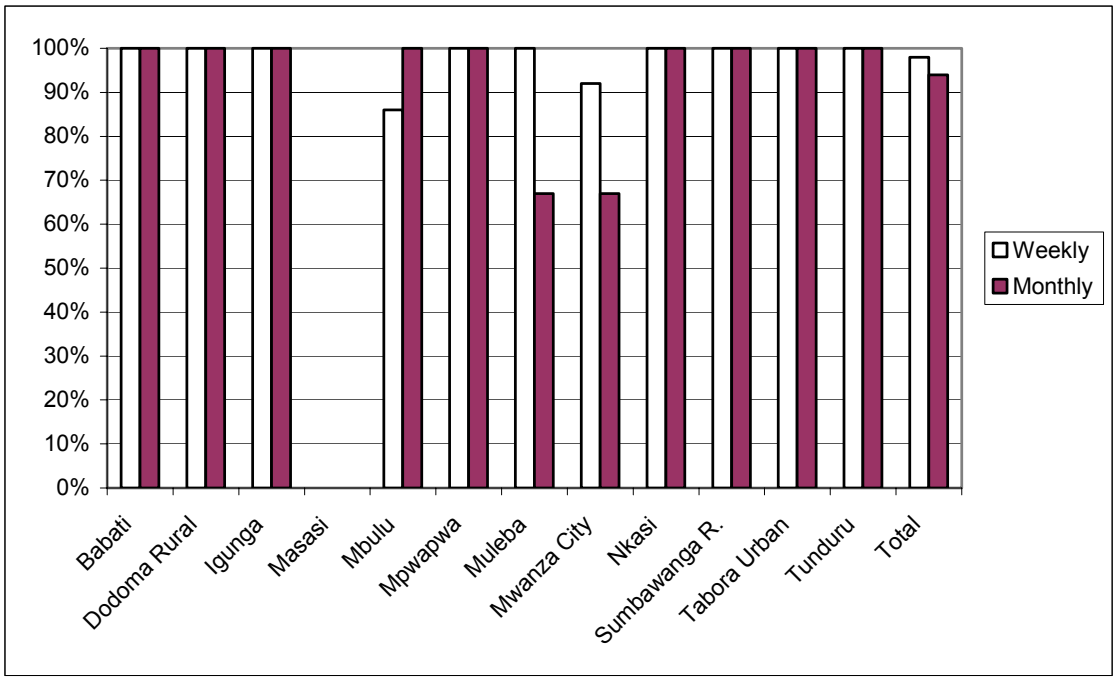
As Figure 2 shows, total reporting completeness for all districts was 67 percent (range: 10-95 percent) for weekly reports and 69 percent (range: 26-100 percent) for monthly reports during the quarter assessed. Monthly reports were timelier than weekly reports in six districts, while five districts had more timely weekly reports, and one district had no difference between the two. Four districts met the target of receiving 80 percent of expected weekly reports for the quarter, and five districts met the 80 percent target for monthly reports. This represented an improvement from the baseline data collection, in which none of the districts met the 80 percent target, and total reporting completeness for all districts was just 33 percent (range 7-71 percent) for monthly reports and 19 percent (range 1-48 percent) for weekly reports. During January–March 2005, Dodoma Rural and Masasi districts had the highest completeness for weekly reports (100 percent and 93 percent, respectively), while Nkasi and Sumbawanga performed best for monthly reports (95 percent each).

Figure 2: Completeness of Health Facility Reporting to District



Completeness for district reports to the region during the quarter assessed was much higher: 98 percent (range: 86-100 percent) for weekly reports and 94 percent (range: 67-100 percent) for monthly reports overall (see Figure 3). These results demonstrate a significant improvement over the baseline values of 66 percent for weekly reports and 80 percent for monthly reports. It should be noted that these results cover all districts within the regions, not only those participating in the IDSR project activities. Just three districts (Mbulu, Masasi, Mwanza City) did not achieve 100 percent completeness of weekly reporting, and three did not achieve 100 percent completeness of monthly reporting (Masasi, Muleba, Mwanza City). No regional data were available for Masasi district, because the regional IDSR focal person was not available to provide the required data.

Figure 3: Completeness of District Reporting to Region



When results from project districts were analyzed separately from the regional data, the project districts performed better than the regional averages for timeliness and completeness of both weekly and monthly reports (Table 6). The difference was most pronounced for weekly and monthly timeliness.

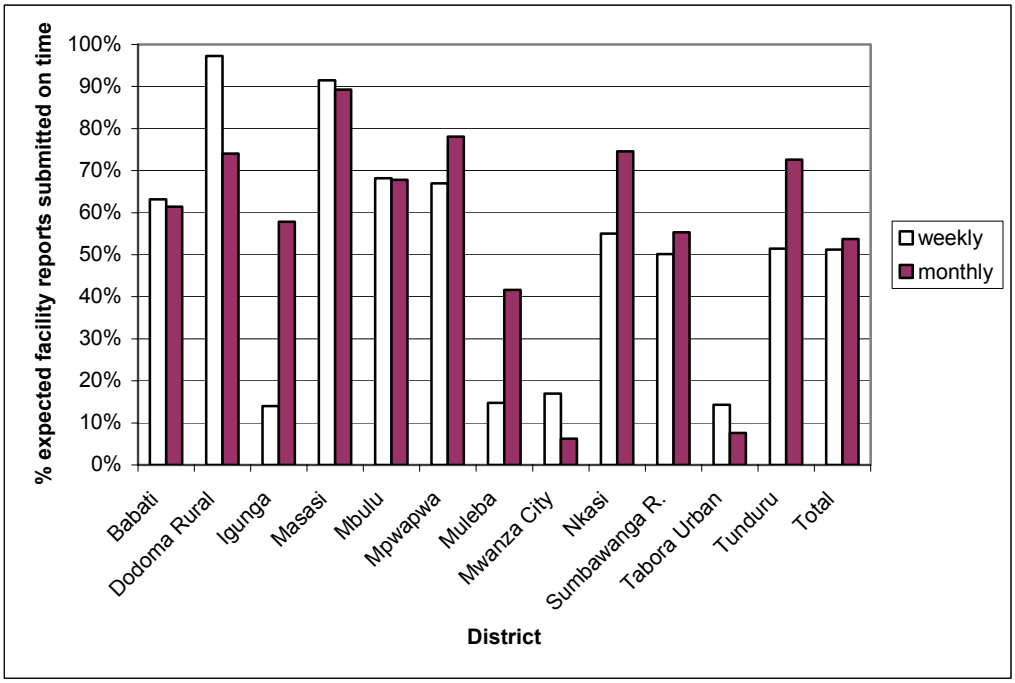
Table 6: Performance of Project Districts on Reporting to Regions

	Timeliness		Completeness	
	Weekly	Monthly	Weekly	Monthly
All districts	86%	54%	96%	88%
Project districts	95%	79%	98%	94%

4.1.1.2 Timeliness

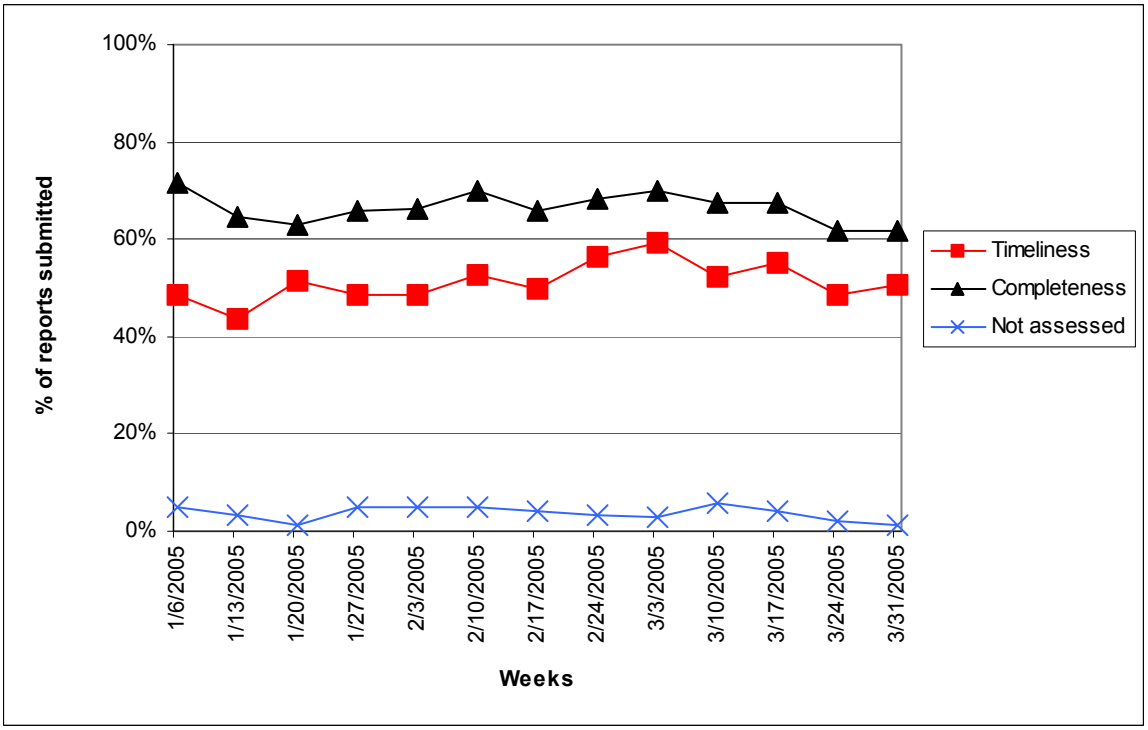
All project districts were tracking timeliness of weekly and monthly IDSR reports. As Figure 4 shows, overall timeliness of reporting was only 51 percent (range 14-97 percent) for weekly reports and 54 percent (range: 6-89 percent) for monthly reports. However, this represented a dramatic improvement over the baseline findings of 8 percent timeliness for weekly reports and 24 percent timeliness for monthly reports. Timeliness varied dramatically, with Tabora Urban and Mwanza City having the lowest overall proportion of weekly and monthly reports submitted on time. Dodoma Rural and Masasi districts were strongest with weekly timeliness (97 and 91 percent, respectively) and were the only two districts to exceed the target of 80 percent of reports received on time. Masasi, Mpwapwa, and Dodoma Rural had the highest monthly timeliness, but only Masasi district met the 80 percent target.

Figure 4: Timeliness of Health Facility Reporting to District



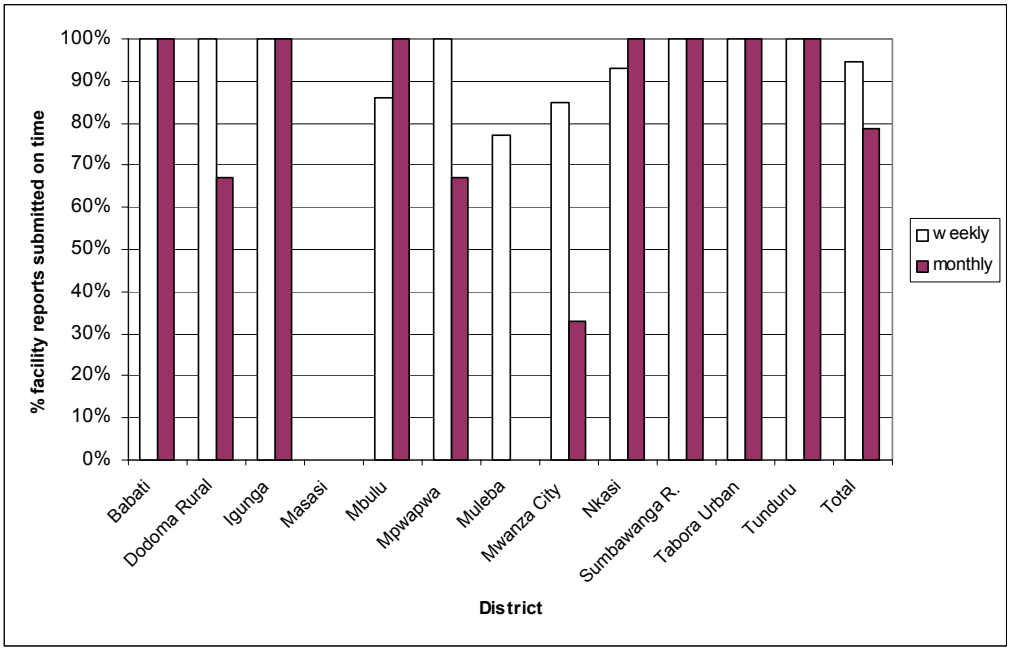
Examining the performance of all facilities combined over time, Figure 5 shows that completeness and timeliness followed similar patterns during the quarter. Timeliness was lowest during the week of January 13, and then remained fairly constant between 50 and 60 percent through the rest of the quarter. Completeness was highest during the week of January 6 and then varied from about 60 to 70 percent for the rest of the quarter, dropping a bit at the end of the quarter.

Figure 5. Completeness and Timeliness of Facility Reporting by Week



Timeliness of district reporting to the regions was stronger than facility reporting to the districts. On average 95 percent (range: 77-100 percent) of expected weekly reports were on time, while the figure was 79 percent (range: 0-100 percent) for monthly reports. As for facility reports to the districts, these findings show a marked improvement over the baseline, where just 47 percent of weekly reports and 60 percent of monthly reports were received by the regions on time. Several districts (Babati, Igunga, Sumbawanga Rural, Tabora Urban, and Tunduru) achieved 100 percent timeliness of both weekly and monthly reports. Muleba had 77 percent of weekly reports on time, but no monthly reports on time. As noted earlier, regional data were not available to assess district to region reporting for Masasi district.

Figure 6: Timeliness of District Reporting to Region



4.1.1.3 Observations

This section details some of the key observations related to reporting noted during follow-up data collection.

- Organization of the hard copies of IDSR reports had improved from the baseline assessment, with most districts having filing systems to separate weekly and monthly reports; however, in Mwanza City, some of the weekly and monthly reports were misfiled.

- The printed/photocopied monthly and weekly IDSR reporting forms were not available in some health facilities in Sumbawanga Rural, Nkasi, Tunduru, Mwanza, and Muleba districts. These facilities used hand-drawn report forms to record IDSR data. In Muleba, some facilities had a shortage of stationery and thus facility registers had some pages removed to be used for writing reports. In Mwanza City, most of the facilities were still using the old Infectious Disease weekly report forms instead of the updated IDSR weekly and monthly reporting forms.

- In some districts only one computer was available, and this computer was shared by various offices. As a result, IDSR staff did not always have access to the computer to enter IDSR data into the district IDSR database. In Sumbawanga Rural district, the installed IDSR

database had been unintentionally deleted and could no longer be recovered. Availability of and regular access to a computerized IDSR data entry system is not required for adequate IDSR system functioning at the district level; however, computer-based tools may contribute to improved capacity for data management and analysis at this level.

- While completion and timely submission of weekly and monthly reports from facilities to districts had improved substantially over baseline, challenges still remained in this area. Often facility in-charges noted that there were too many forms to be filled in regularly and this contributed to poor performance with respect to IDSR reporting. In Mpwapwa and Dodoma Rural districts, some hospitals were not submitting reports to the district due to challenges in compiling outpatient and inpatient disease information and lack of staff responsible for this work. Some of the completed reports in Mwanza City and Muleba did not have the signature of the receiving officer, nor was the date of report receipt noted on them. Some facility in-charges reported being unclear of the deadlines for submission of monthly IDSR reports to the district level, and some facilities in Mwanza City and Muleba did not adhere to the same reporting deadlines that were set by the district. In addition, some facilities sent weekly reports for only three diseases instead of the seven expected to be reported weekly.

- Some reports from health facilities were missing at the district level. This was particularly a problem for reports received via radio call by a district officer who was not the IDSR focal person.

4.1.2 Accuracy of Reports

Ensuring high quality data is an important issue for a surveillance system. Complete reporting is meaningless if the data contained therein do not reflect the real situation. As part of this data collection exercise, patient registers were reviewed at selected facilities and cases and deaths were tallied for a specified period (one month within the quarter under review). The results of this tally were then compared to the monthly report that the facility had submitted to the district for the same period. At the district level, all facility monthly reports were compiled and compared to the report that the district had submitted to the region. The results are described in the following sections.

4.1.2.1 Facility Reports to Districts

A total of 97 facility reports and registers were reviewed, with the majority (89 percent) from March, 6 percent from January, and 5 percent from February. Although cases and deaths are reported separately according to age groups (under five years and over five years), analysis did not reveal significant differences between the age groups so results were combined for this report. The data analysis allowed for a 5 percent margin of error in determining whether a report was accurate (using the figures tallied by the data collectors as the standard).

Table 7 shows that accuracy was quite low for a number of the disease conditions. The proportion of reports for which the number of cases agreed with the register review (+/- 5 percent) was less than 50 percent for diarrhea with some dehydration, pneumonia, and uncomplicated malaria. However, it should be noted that the discordance is likely a direct consequence of the large number of reports for these diseases compared to the other priority diseases. Similarly, the 100 percent accuracy for cases and deaths of acute flaccid paralysis (AFP), neonatal tetanus (NNT), measles, plague and yellow fever reflects the

fact that no cases or deaths were reported for these diseases during the month of interest, and just one case of cholera was reported.

Accurate reporting of deaths met or exceeded 95 percent for all diseases except uncomplicated malaria (86 percent), severe pneumonia (92 percent), and severe malaria (94 percent).

Table 7: Summary of Monthly Report Accuracy Results – Facilities

Comparison of data reported by facilities on monthly reports with data compiled independently from facility registers

Disease Conditions	Proportion of reports for which:			
	Cases agreed	Deaths agreed	Cases under-reported	Cases over-reported
Diarrhea with some dehydration	35%	100%	28%	39%
Pneumonia	41%	95%	37%	28%
Malaria uncomplicated	47%	86%	37%	40%
Dysentery	66%	99%	16%	18%
Severe pneumonia	66%	92%	11%	24%
Diarrhea with severe dehydration	79%	98%	4%	16%
Animal bites	81%	100%	9%	9%
Malaria severe	90%	94%	4%	6%
Typhoid	92%	98%	1%	7%
Rabies	98%	99%	1%	1%
Meningitis	99%	99%	1%	0%
NNT	100%	100%	0%	0%
Cholera	100%	100%	0%	0%
AFP	100%	100%	0%	0%
Measles	100%	100%	0%	0%
Plague	100%	100%	0%	0%
Yellow fever	100%	100%	0%	0%

The results of the register review were further analyzed by district. The average accuracy rate was 82 percent for all disease cases combined, ranging from a low of 75 percent in Igunga to a high of 94 percent in Muleba. This result demonstrated some improvement from the baseline accuracy rate of 72 percent. For deaths, the average accuracy rate was 98 percent, and there was very little variation between districts, with accuracy ranging from 95 percent to 99 percent. These results were not significantly different than baseline findings (presented elsewhere). Tables with details for facilities and districts are located in Annex D.

4.1.2.2 District Reports to Regions

Eleven of the district reports reviewed were from March, and one was from February. As with the facility data, the number of reports for which cases and deaths agreed was based on a 5 percent margin of error.

Table 8 shows that accuracy for case reporting was quite low for most of the diseases under surveillance. As was the case for facility to district reports, case reporting accuracy was high (in this case, 100 percent) for those diseases with no cases reported during the study period (NNT, AFP, measles, and plague). Accuracy for death reporting was significantly higher than that for case reporting, though it was lower for uncomplicated malaria, severe pneumonia, and pneumonia deaths than the other reportable diseases.

Table 8: Summary of Report Accuracy Results – Districts

Comparison of data reported by districts on monthly reports with data compiled independently from facility reports

Disease Conditions	Number of reports for which:			
	Cases agreed	Deaths agreed	Cases under-reported	Cases over-reported
	n (%)	n (%)	n (%)	n (%)
Malaria severe	9 (75%)	11 (92%)	1 (8%)	2 (17%)
Diarrhea with some dehydration	3 (25%)	11 (92%)	4 (33%)	5 (42%)
Malaria uncomplicated	3 (25%)	7 (58%)	3 (25%)	6 (50%)
Severe pneumonia	3 (25%)	8 (67%)	6 (50%)	3 (25%)
Pneumonia	4 (33%)	9 (75%)	5 (42%)	3 (25%)
Dysentery	4 (33%)	11 (92%)	3 (25%)	5 (42%)
Diarrhea with severe dehydration	5 (42%)	11 (92%)	6 (50%)	1 (8%)
Animal bites	5 (42%)	11 (92%)	3 (25%)	4 (33%)
Typhoid	7 (58%)	12 (100%)	3 (25%)	2 (17%)
Meningitis	9 (75%)	11 (92%)	1 (8%)	2 (17%)
Rabies	10 (83%)	11 (92%)	1 (8%)	1 (8%)
Cholera	10 (83%)	12 (100%)	1 (8%)	1 (8%)
NNT	12 (100%)	12 (100%)	0	0
AFP	12 (100%)	12 (100%)	0	0
Measles	12 (100%)	12 (100%)	0	0
Plague	12 (100%)	12 (100%)	0	0

*Denominator is 12 total reports for each disease

Analysis by district showed that the average accuracy of reporting for cases was 60 percent, ranging from 41 percent in Muleba and Igunga to 94 percent in Babati and Mbulu. This represents no real change from the baseline result of 58 percent. Average accuracy for reporting of deaths was 91 percent, a slight increase over the baseline value of 86 percent, and ranged from 76 percent in Muleba to 100 percent in Babati, Mbulu, and Nkasi. Detailed district results are presented in Annex E.

4.1.3 Use of Case Investigation Forms

According to the MOH National Guidelines for IDSR, CIFs must be completed for suspected cases of AFP, NNT, measles, meningitis, cholera, plague, and yellow fever. There were no reported cases of NNT, measles, plague, or yellow fever in the 12 project districts from January through March 2005. Igunga, Masasi, Muleba, and Tunduru all reported cases of meningitis during this timeframe. Muleba and Sumbawanga Rural both reported cholera cases, and Sumbawanga Rural was the only district to report

AFP cases. Weekly surveillance reports submitted by all facilities in a district were used as the source for the number of cases reported to the district during the quarter.

Overall, just 8 percent of reported cases of AFP, meningitis, and cholera were reported using CIFs (Table 9). The proportion of reported cases with CIFs was best for AFP (100 percent), followed by cholera (7 percent) and meningitis (4 percent). However, for meningitis and cholera outbreaks, it is expected that CIFs will only be used for the first few cases according to a sampling strategy, and then line lists should be used to account for all cases. Therefore, the 20 percent reporting of cholera cases in Muleba is adequate. Of the four districts reporting meningitis, Masasi was the only one to complete a CIF, and did so for only one of its nine reported cases.

Table 9: Number of Case Investigation Forms Found at District

	AFP			Meningitis			Cholera			Total		
District	Cases	Forms	%	Cases	Forms	%	Cases	Forms	%	Cases	Forms	%
Babati										0	0	
Dodoma Rural										0	0	
Igunga				4	0	0%				4	0	0%
Masasi				9	1	11%				9	1	11%
Mbulu										0	0	
Mpwapwa										0	0	
Muleba				3	0	0%	30	6	20%	33	6	18%
Mwanza City										0	0	
Nkasi										0	0	
Sumbawanga Rural	2	2	100%				54	0	0%	56	2	4%
Tabora Urban										0	0	
Tunduru				7	0	0%				7	0	0%
TOTAL	2	2	100%	23	1	4%	84	6	7%	109	9	8%

It is difficult to compare CIF usage during the baseline and follow-up because the actual disease situation was different at these two points in time. At baseline, outbreaks of cholera (2,090 reported cases), meningitis (66 reported cases), and measles (58 reported cases) occurred in the project districts, leading to a much larger denominator (2,234 cases at baseline vs. 109 cases at follow-up). As mentioned earlier, CIFs are not meant to be filled in for every single case during large outbreaks such as those seen at the baseline, which makes interpretation of the overall 0.6 percent CIF usage at baseline challenging. However, the results do show that CIF usage improved for AFP (15 percent at baseline vs. 100 percent at follow-up), though the small number of AFP cases at follow-up may have contributed to this apparently high CIF usage. Results from both rounds of data collection indicated the need to strengthen CIF usage for NNT reports (0 percent at baseline and 4 percent at follow-up).

4.2 Use of Surveillance Data

Collecting data through weekly and monthly surveillance reports and CIFs is necessary but not sufficient by itself to improve an IDSR system and achieve the desired public health impact. These data must be analyzed, interpreted, and used for decision making in order for their value to be realized. The following three indicators summarize 1) analysis of epidemiological data, 2) knowledge and use of system performance indicators, and 3) use of both types of data for planning and monitoring.

4.2.1 Routine Analysis of Data

WHO/AFRO recommends two specific types of analysis for malaria – tracking of monthly malaria inpatient cases and deaths, and long-term trend analysis (i.e., year to year) – for children under five years, and that these analyses include data from the previous three months.[3] According to follow-up monitoring and evaluation results, analysis of data at the district level improved compared to the baseline. Nine of the 12 districts reported doing any type of trend analysis for IDSR priority diseases on a monthly or quarterly basis, and all of these districts stated that they did some type of trend analysis for malaria. This was a significant increase from baseline, when just two districts (Mbulu and Nkasi) reported doing malaria trend analysis. Table 10 shows that approximately half of the districts were performing the specified analyses, although only four districts met all of the criteria (graphs for Mpwapwa and Nkasi did not include current data). Three districts (Mwanza City, Tabora Urban, and Tunduru) did not have any type of malaria trend analysis. Several districts also had trend analysis for diarrhoea, pneumonia, and dog bites, as well as lists of top 10 diseases.

Table 10: Types of Data Analysis by District

Criteria	Babati	Dodoma R.	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
Any malaria analysis	X	X	X	X	X	X	X		X	X			**9**
Monthly malaria trends <5	X		X		X	X	X		X				**6**
Analysis current	X		X		X		X						**4**
Long-term malaria trends <5	X		X		X	X	X						**5**
Analysis current	X		X		X		X						**4**
TOTAL*	**100%**	**20%**	**100%**	**20%**	**100%**	**60%**	**100%**	**0%**	**40%**	**20%**	**0%**	**0%**	**47%**

* Of 5 for each district; of 60 for all districts combined

[3] WHO/AFRO also proposes weekly trend analysis of cerebrospinal meningitis for districts at high risk for meningitis, but none of the project districts were considered to be in this category.

At the facility level, 54 percent of facilities reported doing any type of trend analysis for priority diseases, and 78 percent of those facilities (42 percent overall) stated that they did trend analysis for malaria (Table 11). This represents a notable increase over the baseline data, when 33 percent of facilities did any analysis and 28 percent did trend analysis for malaria. Performance on the specified analyses also improved markedly. Twenty-seven percent of all facilities had graphs showing monthly malaria cases and deaths in children under five (up from 4 percent) and 20 percent of facilities had long-term malaria trends for children (up from 0 percent). Among the facilities that had monthly malaria cases and deaths graphed for children under five, 71 percent included current data. Among facilities that had long-term malaria trends graphed for children under five, 48 percent included current data.

Table 11: Types of Data Analysis at Facility Level

Criteria	All facilities BASELINE (N=109)	All facilities FOLLOW-UP (N=104)
Any trend analysis	33%	54%
Any malaria analysis	28%	42%
Monthly malaria trends <5	4%	27%
Analysis current	3%	20%
Long-term malaria trends <5	0%	20%
Analysis current	0%	10%

Eighteen percent of all health facilities had both types of recommended data analysis, but only six percent of facilities had the analysis that included recent data. These were Babati District Hospital, Mbulu District Hospital, Likokona Dispensary in Masasi district, Chogola Dispensary in Mpwapwa district, and Ligoma and Azimio Dispensaries in Tunduru district. The fewest graphs were seen in Mwanza City and Sumbawanga Rural districts.

Regarding other types of analyses seen at health facilities:

- 63 percent had lists of the top 10 diseases in their catchment areas
- 24 percent had other types of malaria analysis
- 14 percent had analysis of pneumonia data
- 13 percent had analysis of diarrheal disease data

4.2.2 Surveillance Monitoring

Health personnel at both the district and regional levels were asked about their knowledge of IDSR indicators, whether they had reviewed those indicators during the previous three months, and whether they had taken any actions as a result of the review. Knowledge of the indicators found in the National Guidelines for IDSR has improved since the baseline, with nine districts indicating that they were familiar with the indicators, up from three at baseline (Table 12). The majority of these districts cited timeliness, completeness, report accuracy and case fatality rates as examples of indicators they should monitor. Five districts also stated that they had calculated some of these indicators during the previous quarter, although only three (Dodoma Rural, Mpwapwa, and Tunduru) were able to present the results at the time of data collection.

Table 12: Surveillance Monitoring (District level)

Criteria	Babati	Dodoma R.	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru
Knew indicators	X	X		X	X	X	X		X	X		X
Calculated indicators	X	X		X		X						X
Met to review indicators		X	X	X							X	
Took actions based on review		X	X	X							X	X

Further, four districts stated that they had met during the past quarter to review the performance of the surveillance system and five had taken actions aimed at improving performance. Several districts had sent letters to health facilities that were not submitting reports. Other examples of actions included copying and distributing reporting forms to facilities where they were missing, and telling facility personnel that they should send reports regularly using local buses, rather than waiting to bring the reports when they came to collect their salaries once a month.

Seven regions reported that they were familiar with the IDSR indicators, but only four provided evidence to support this. Dodoma Rural and Ruvuma were the only two regions that had calculated and provided results for the specified indicators. None of the regional health management teams had met in the previous quarter to review indicators that tell about the performance of the IDSR system.

4.2.3 Planning and Monitoring Based on Data

The primary purpose of generating high quality, timely data is to use that information to make decisions about appropriate actions to take, and to continue to use data to see whether the actions taken have produced the desired effect. District teams were asked whether they had used IDSR data to provide justification for their plans and actions, as well as to monitor their impact. All of the districts (similar to baseline findings) stated that they had used data for planning purposes and provided the following examples:

- Many districts referred to using malaria data that showed an increasing number of cases to trigger response actions, such as initiating indoor insecticide spraying or purchasing insecticide-treated nets (Mpwapwa, Mbulu, Sumbawanga Rural, and Masasi)
- Mwanza City and Tunduru district referred to using IDSR data to prepare their 2005 plans.

Similar to baseline findings, nine districts also stated that they had used data for monitoring their activities, primarily in the past year. Examples included:

- Monitoring the number of cholera cases following an outbreak (Dodoma Rural)
- Monitoring performance targets for the Comprehensive Council Health Plan (Mbulu)
- Discussing the impact of different interventions during Council Health Management Team meetings (Tunduru)

4.3 Outbreak Management

Appropriate management of suspected outbreaks is an important factor in minimizing morbidity and mortality. Five of the 12 districts reported during the interview that there had been a suspected outbreak of an epidemic-prone disease in their district within the previous three months. A suspected outbreak occurs when the number of reported cases surpasses the epidemic threshold, which for most of the epidemic-prone diseases is one case. District teams are expected to investigate suspected outbreaks to determine whether they are real and subsequently confirm them as appropriate (usually based on laboratory confirmation). Table 13 shows the distribution of reported suspected outbreaks among districts.

Table 13: Suspected Outbreaks during January–March 2005

	Masasi	Muleba	Mwanza C.	S'wanga R.	Tunduru	**Total**
Cholera		X		X		**2**
Meningitis	X				X	**2**
Rabies			X			**1**

For this analysis, outbreak management was divided into three steps: investigation, laboratory confirmation, and response. A checklist of elements evaluated each of these steps, with a total of 19 criteria. Muleba and Sumbawanga Rural districts had the best performance, meeting 96 percent and 94 percent, respectively, of the criteria for overall effective outbreak management. The remaining districts scored between 48 percent and 83 percent (Table 14). A more detailed analysis for each of the three outbreak management steps is given in the following sections.

Table 14: Overall Outbreak Management Performance

	Masasi	**Muleba**	**Mwanza C.**	**S'wanga R.**	**Tunduru**	**Total**
Disease	**Meningitis**	**Cholera**	**Rabies**	**Cholera**	**Meningitis**	
Outbreak investigation	88%	88%	63%	100%	75%	**83%**
Laboratory confirmation	100%	100%	0%	83%	67%	**73%**
Response to outbreak	60%	100%	80%	100%	60%	**80%**
Overall	**83%**	**96%**	**48%**	**94%**	**67%**	**78%**

Regional health management team members were also asked about their participation in the investigation of and response to outbreaks that had occurred in their districts during the previous quarter. Kagera and Rukwa regions reported that there had been suspected outbreaks (cholera) in their districts during the previous quarter and both stated that they had participated in the outbreak investigation and response activities. These activities included alerting the laboratory and national level, providing supplies for specimen collection, supporting the districts in their efforts, and processing the release of funds.

It should be noted that there were discrepancies between what the districts and regions reported to the data collection teams regarding the occurrence of outbreaks during the period under review. While only two of the regions stated that there had been outbreaks in their districts, districts in five of the regions reported outbreaks during their interviews (Table 15).

Table 15: Reporting of Outbreaks in Districts and Regions

Regions	Districts	District reported outbreak	Region reported outbreak
Dodoma	Dodoma Rural		
	Mpwapwa		
Kagera	Muleba	X	X
Manyara	Babati		
	Mbulu		
Mtwara	Masasi	X	
Mwanza	Mwanza City	X	
Rukwa	Nkasi		X
	Sumbawanga Rural	X	
Ruvuma	Tunduru	X	
Tabora	Tabora Urban		
	Igunga		

4.3.1. Appropriate Investigation of Suspected Outbreaks

Investigations of suspected outbreaks were evaluated based on the following criteria:

- Timely notification from the facility to the district (less than 24 hours)
- Confirmation of diagnosis (review of clinical history)
- Preparation for the investigation
- Searching for other cases (in facility records, other facilities, and the community)
- Collection of case-based information
- Compilation and analysis of data

As Table 16 illustrates, timely notification of the outbreak to the district was the weakest area; only two districts were notified of the suspected outbreak within 24 hours. District performance was quite good for the other investigation steps. Sumbawanga Rural district met all of the criteria for an outbreak investigation, while Masasi and Muleba districts only missed one step. Mwanza City had the poorest performance, but this can be partially explained by the nature of the suspected outbreak (there was only one case of rabies, so there was no pressing need to search in other facilities, nor were there enough data to analyze).

Table 16: District Performance in Outbreak Investigation

	Masasi	Muleba	Mwanza C.	S'wanga R.	Tunduru	Total
Disease	**Meningitis**	**Cholera**	**Rabies**	**Cholera**	**Meningitis**	
Timely notification			X	X		**2**
Confirm diagnosis	X	X	X	X	X	**5**
Prepare investigation	X	X	X	X		**4**
Search records	X	X		X	X	**4**
Search facilities	X	X		X	X	**4**
Search community	X	X	X	X	X	**5**
Collect case information	X	X	X	X	X	**5**
Analyze data	X	X		X	X	**4**
TOTAL	88%	88%	63%	100%	75%	**83%**

4.3.2 Effective Laboratory Confirmation Process

Several questions regarding the laboratory confirmation process were asked at both the district office and the referral laboratory, as in many cases the district personnel did not have information on the date that a specimen was received at the laboratory, but the laboratory technician did. The results reported below are based on information confirmed by the laboratories.

Two of the five districts with outbreaks collected specimens for laboratory confirmation (Table 17). Mwanza City did not take any specimens as there was only one case of suspected rabies (the patient died). All of the steps of the laboratory confirmation process were successfully implemented in Masasi and Muleba districts. In Sumbawanga Rural the number of samples collected was inadequate. All of the districts sent appropriate documentation with the specimens, and all received feedback from the laboratory on the results of the tests (all were positive). The samples from Masasi and Tunduru (meningitis) were sent to the district hospitals, while the samples from Muleba and Sumbawanga Rural (cholera) were sent to the regional laboratories.

Table 17: District Performance in Laboratory Confirmation

	Masasi	Muleba	Mwanza C.	S'wanga R.	Tunduru	Total
Disease	**Meningitis**	**Cholera**	**Rabies**	**Cholera**	**Meningitis**	
Appropriate # samples	X	X			*	**2**
Appropriate documentation	X	X		X	X	**4**
Appropriate handling and transport	X	X		X	X	**4**
Appropriate laboratory	X	X		X	X	**5**
Appropriate timeframe	X	X		X	*	**3**
Lab confirmation received	X	X		X	X	**4**
TOTAL	100%	100%	0%	83%	67%	**73%**

* Information on number of samples and timeframe for submitting samples was not available for Tunduru.

4.3.3 Appropriate Response to Confirmed Outbreaks

The response to confirmed outbreaks was evaluated using the following criteria:

- CHMT meets to discuss/plan response
- Response is based on data
- Information is provided to the community
- Disease-specific actions are taken
- Outbreak report includes case-based data

Performance in responding to outbreaks was strong in most districts. Muleba and Sumbawanga Rural districts both carried out all of the steps, including taking the appropriate response actions for the disease (Table 18). Neither Masasi nor Tunduru districts implemented vaccination campaigns to deal with the suspected outbreaks of meningitis, thus their responses were not quite complete.

Table 18: District Performance in Outbreak Response

	Masasi	Muleba	Mwanza C.	S'wanga R.	Tunduru	Total
Disease	**Meningitis**	**Cholera**	**Rabies**	**Cholera**	**Meningitis**	
CHMT meets	X	X	X	X	X	**5**
Response based on data	X	X	X	X	X	**5**
Inform community	X	X	X	X	X	**5**
Disease-specific actions		X	X	X		**3**
Report with case-based data	-	X	-	X	-	**2**
TOTAL	60%	100%	80%	100%	60%	80%

Districts were also asked whether they had reviewed the district's management of the outbreak, and this indicator included three criteria: holding a review meeting, making recommendations for improvement, and implementing these recommendations. Masasi, Sumbawanga Rural, and Tunduru districts all stated that they had reviewed the recent outbreak. Masasi stated that their outbreak had been handled well, but Tunduru noted that in the future they would need to ensure that they had adequate drug stocks on hand to respond to an outbreak.

4.3.4 Case Fatality Rates

Calculating CFRs serves as a means of assessing the quality of case management. WHO/AFRO recommends that this be done particularly for cholera, meningitis, and yellow fever. From January through March 2005, two districts reported cases of cholera, four reported cases of meningitis, and none reported yellow fever. During interviews, only Muleba district reported that it had calculated its own CFRs. However, data in weekly health facility reports for the same period allowed for calculation of CFRs by district (Table 19). The WHO/AFRO target CFRs are 1 percent for cholera and 10 percent for meningitis. These data show actual CFRs substantially above the targets for both cholera and meningitis.

Table 19: Case Fatality Rates for Cholera and Meningitis, January–March 2005

Disease	Cholera			Meningitis		
District	**Cases**	**Deaths**	**CFR**	**Cases**	**Deaths**	**CFR**
Igunga				4	0	0%
Masasi				9	3	33.3%
Muleba	30	2	6.7%	3	1	33.3%
Sumbawanga R.	54	6	11.1%			
Tunduru				7	2	28.6%
TOTAL	84	8	9.5%	23	6	26.1%
TARGET			**1.0%**			**10.0%**

4.3.5 Outbreak Preparedness

The NIMR/PHR*plus* IDSR project organized a series of workshops in August 2003 to help districts develop epidemic preparedness plans. The plans included the following six elements:

- Forecasting: Review of disease history and estimation of possible outbreaks
- Reporting: Mechanisms to assure complete and timely reporting
- Staffing: Roles and responsibilities during outbreaks
- Buffer stocks: Adequate drugs and medical supplies necessary to initially respond to and/or treat each of the priority diseases available
- Training: Training needs and plans to address them identified in the plan
- Health education: Identified individuals for implementing health education activities in the community and materials available

Table 20: Elements of Epidemic Preparedness Plans

	Babati	**Dodoma R.**	**Igunga**	**Masasi**	**Mbulu**	**Mpwapwa**	**Muleba**	**Mwanza C.**	**Nkasi**	**S'wanga R.**	**Tabora U.**	**Tunduru**	Total
Forecasting	X		X		X		X			X		X	**6**
Reporting	X	X	X		X	X	X			X		X	**8**
Staffing	X		X		X	X	X			X		X	**7**
Buffer stocks	X	X	X		X	X	X		X	X		X	**9**
Training	X	X	X		X	X	X		X	X		X	**9**
Health education	X	X	X		X	X	X		X	X		X	**9**
Written/Updated	July '04	Dec '04	Aug '03		Mar '05	Apr '05	Aug '03		Mar '05	Apr '05		Apr '05	**9**
TOTAL FINAL	6	4	6	0	6	5	6	0	3	6	0	6	**68%**
TOTAL BASELINE	*5*	*6*	*6*	*6*	*5*	*5*	*6*	*6*	*4*	*2*	*6*	*3*	***83%***

Nine districts showed their epidemic preparedness plans to the data collectors, while two districts (Masasi and Mwanza City) stated that they had plans but were not able to provide a copy during the visit. Tabora Urban stated that they did not have such a plan. All but two of the districts (Igunga and Muleba) had updated their plans since they were originally prepared in August 2003, but even these plans were considered to be still valid as they were less than two years old.

The section on forecasting was missing most often, which is understandable given the data and statistical expertise required to appropriately forecast potential outbreaks (Table 20). However, pre-defined roles and responsibilities are key to effectively managing outbreaks and the section addressing these staffing issues was missing from the Dodoma Rural and Nkasi plans. The remaining sections were complete for the plans reviewed.

4.4 Management of IDSR System

4.4.1 Linkages within and outside the Health Sector

Strengthening surveillance at the district level involves working with a variety of partners (or stakeholders) both within the health system and outside of it. These partners may include vertical programs within the health sector (such as the Expanded Programme on Immunization or the Malaria Programme), laboratories, other sectors (such as education, agriculture and livestock, or water), and other community or administrative structures (such as the police and the district council). District health teams were asked about their communication and coordination with others during the previous quarter in four particular areas: sharing data, coordinating resources, implementing prevention activities, and inviting others to participate in meetings where IDSR issues were discussed.

Table 21 shows that all but two of the districts (Mbulu and Babati) met at least three of the four criteria for this indicator, while seven districts met all of the criteria. The element that scored lowest for all districts was inviting others to meetings where IDSR is discussed; only eight of the 12 districts achieved this, as opposed to 10 districts meeting the other criteria. Overall, 95 percent of the criteria were met, a slight increase from the baseline.

Table 21: Evidence of Linkages Within and Outside the Heath Sector

	Babati	**Dodoma R.**	**Igunga**	**Masasi**	**Mbulu**	**Mpwapwa**	**Muleba**	**Mwanza C.**	**Nkasi**	**S'wanga R.**	**Tabora U.**	**Tunduru**	Total
Shared data	X	X	X	X			X	X	X	X	X	X	**10**
Coordinated resources		X	X	X		X	X	X	X	X	X	X	**10**
Implemented activities		X	X	X		X	X	X	X	X	X	X	**10**
Invited to IDSR meetings		X	X	X		X	X	X		X	X		**8**
TOTAL FINAL	1	4	4	4	0	3	4	4	3	4	4	3	**95%**
TOTAL BASELINE	*4*	*4*	*2*	*4*	*3*	*3*	*1*	*2*	*4*	*4*	*2*	*4*	***93%***

Districts provided several examples of how the health team had coordinated with others regarding surveillance:

- Sharing data and coordinating with the livestock department or the district council to deal with stray dogs in order to address increasing numbers of dog bites and potential rabies cases (Babati, Sumbawanga Rural, Nkasi, and Mwanza City).
- Sharing resources such as vehicles and human resources, particularly to respond to suspected outbreaks. Partners most commonly cited included the EPI, the education sector, the fisheries department (boats), and the water and sanitation department (Mpwapwa, Nkasi, Tunduru, Igunga, Tabora Urban). In Tunduru district, police radio calls were used by facilities for the transmission of their weekly and monthly IDSR reports.
- Prevention activities addressing IDSR priority diseases were carried out in coordination with the livestock department for dog vaccination (Dodoma Rural), with an environmental NGO to distribute insecticide-treated nets (Mpwapwa), and in collaboration with village authorities to promote environmental sanitation and mosquito control (Nkasi).
- IDSR issues were discussed with representatives from other sectors or programs during a health stakeholder meeting (Muleba), at primary health care meetings aimed at addressing epidemic-prone diseases (Masasi), and at a district quarterly meeting that included the private health sector and district officials (Mwanza City and Sumbawanga Rural).

4.4.2 Planning and Implementation of IDSR Activities

A key measure of the institutionalization and sustainability of IDSR is whether related activities and their associated costs are included in district plans and budgets. If an activity is not documented in the district plan and sufficient funding allocated, it is not likely to occur.

As part of the district interview, participants were asked about whether their district had planned for any of the following activities: 1) supervision visits to health facilities, 2) meetings to review or report on IDSR activities, 3) IDSR training, and 4) prevention activities of priority infectious diseases. Current CCHPs and other documented sources (such as supervision schedules or activity calendars) were reviewed to verify the information. Districts were also asked about their implementation of planned activities. Table 22 summarizes the results.

Table 22: Planning and Implementation* of IDSR Activities

	Babati	Dodoma R.	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
Supervision (80% or more of planned visits implemented)		X	X	X								X	4
IDSR meetings			X	X			X				X	X	**5**
IDSR training		X	X		X	X	X	X	X		X	X	**9**
Prevention activities		X	X	X		X	X	X	X	X	X	X	**10**
TOTAL	0	3	4	3	1	2	3	2	2	1	3	4	**58%**

*Activities planned and implemented

Overall results were good: half of the districts were able to meet three or four of the criteria for planning and implementing all of the suggested activities, with two of the districts (Igunga and Tunduru) meeting all of the criteria. Babati, Mbulu and Sumbawanga Rural districts showed the poorest performance. Implementation of supervision visits and regularly holding meetings dedicated to IDSR seem to pose the greatest challenge to districts. Details are described in the following sections.

4.4.2.1 Supervision

Eleven of the districts had included supervision visits to their health facilities in their plans for the quarter (Nkasi did not), with seven districts documenting this in their CCHPs and four districts using a work calendar or other document. Mbulu, Muleba, and Nkasi districts did not have data on the number of supervision visits implemented. Table 23 shows that, for the January–March 2005 period, on average, districts implemented 72 percent of their planned supervision visits for the previous quarter. Mwanza City had planned 80 supervisory visits for the January–March period, and actually visited facilities 241 times during this period, thus implementing three times as many visits as planned. The best performing districts were Dodoma Rural, Masasi, and Igunga. Data collectors did not determine whether IDSR issues had been addressed during these supervision visits.

Table 23: Planning and Implementation of Supervision Visits, January–March 2005

	Babati	Dodoma R.	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
Proportion of planned visits implemented (follow-up)	67%	100%	100%	100%	-	33%	-	301%	-	33%	25%	80%	**72%**
Proportion of planned visits implemented (baseline)	59%	100%	100%	NA	58%	94%	NA	65%	NA	NA	100 %	33%	**33%**

4.4.2.2 IDSR Review Meetings

Ten districts had planned meetings that reported on or reviewed IDSR activities during the previous quarter (Dodoma Rural and Mwanza City did not). This was an increase from six in the baseline evaluation. However, only half of these planned meetings were held, while one other district held a meeting that had not been included in the CCHP (Mwanza City). Several districts stated that IDSR information was often shared as part of CHMT meetings. Masasi district held a specific meeting to review IDSR activities and indicators.

4.4.2.3 IDSR Training

Ten districts had planned training related to IDSR during 2004 (same as was found during baseline), and eight of them carried out their plans. Examples of training topics included:

- Health facilities that were performing poorly were trained in IDSR (Dodoma Rural, Mpwapwa)

- Village leaders were trained on rabies and dog bites (Muleba)
- Teachers were given orientation on malaria and traditional healers were trained in data management (Mwanza City)
- Health facility staff were trained on malaria case management and diarrhea management and prevention (Nkasi)
- Training for the emergency preparedness team (Mbulu)

4.4.2.4 Prevention of Priority Diseases

Ten districts had included activities to prevent priority infectious diseases in their 2004-2005 CCHPs, and all of them carried out prevention activities during the January–March quarter. This represented a slight decrease from baseline, during which 11 districts had carried out prevention activities during the previous quarter. Examples at follow-up included:

- Distribution of insecticide-treated bed nets (Dodoma Rural, Mpwapwa, Tabora Urban)
- Water sanitation and sensitization on/construction of latrines (Dodoma Rural, Mpwapwa, Masasi, Igunga)
- Health education on hygiene (Nkasi, Tabora Urban) and to promote measles immunization (Nkasi)

4.4.2.5 Regional Support for IDSR

During this final assessment, regional health management teams were also asked about whether they had provided assistance to districts in the January–March quarter to help strengthen their IDSR systems. Six of the regions stated that they had provided such support (Manyara did not, and no data were available for Mtwara), as illustrated by Table 24. Supportive supervision was the most common; none had organized any meetings to specifically discuss IDSR. Other examples included support for outbreak response and management from Kagera region, and help with preparing plans and strengthening the health information management system from Mwanza region. Rukwa region reported that it provided the most assistance to its districts.

Table 24: Regional Support to Districts for IDSR

	Dodoma	Kagera	Manyara	Mtwara	Mwanza	Rukwa	Ruvuma	Tabora	Total
Support to project districts									
Supportive supervision	X					X	X	X	**4**
Organize IDSR meetings									**0**
Additional training	X					X			**2**
Supply forms		X				X			**2**
Address communications problems						X	X		**2**
Other		X			X				**2**
Materials disseminated to other districts									
Epidemic preparedness plans							X		**1**
Revised reporting forms					X		X		**2**

	Dodoma	Kagera	Manyara	Mtwara	Mwanza	Rukwa	Ruvuma	Tabora	Total
Laboratory job aids						X	X		**2**
Analysis standards			X				X		**2**
IDSR database							X		**1**
Data interpretation job aid							X		**1**

Regions were also asked whether they had disseminated any IDSR materials to other districts under their responsibility (i.e., those that had not participated in this project); Manyara, Mwanza, Rukwa and Ruvuma regions all reported that they had. Ruvuma region had shared all of the tools that had been provided by the project.

4.4.3 Availability of Tools/Job Aids for IDSR

One reason often cited for not being able to accomplish a task is the unavailability of the required tools. In the case of IDSR, the essential tools and job aids are the facility register, CIFs (disease-specific and generic), weekly and monthly reporting forms, and standard case definitions. Some of these items were revised as part of the IDSR strengthening project, and the final round of data collection sought to determine if these new versions were available in facilities. Staff were asked if they had each of these items, and were asked to show them to the data collectors in order to receive credit. Only one health facility (in Tabora Urban district) had all of the tools available, while 56 percent had more than half of the 10 tools. On average, facilities had three to six of the tools available. As Table 25 shows, these were most likely to be the clinic register and weekly and monthly reporting forms.

Overall there has been little change since the baseline assessment, although the proportion of facilities with appropriate weekly and monthly reporting forms has increased significantly. Five districts showed improved performance in making key tools and job aids available to health facilities (Igunga, Masasi, Mwanza City, Nkasi, and Tabora Urban), while another five declined and two remained the same. Reasons for decreases in the proportion of tools available in some districts were not clear.

Table 25: Availability of Tools and Job Aids at Facility Level, by District (% of facilities visited)

Criteria	**Babati**	**Dodoma R.**	**Igunga**	**Masasi**	**Mbulu**	**Mpwapwa**	**Muleba**	**Mwanza C.**	**Nkasi**	**S'wanga R.**	**Tabora U.**	**Tunduru**	Total (% of facilities with each tool)	*Baseline total*
Register	75	100	43	70	71	100	100	100	100	100	100	100	**89%**	***99%***
CIF* – AFP	38	9	29	10	14	0	29	17	0	0	63	0	**17%**	***17%***
CIF – NNT	50	0	29	10	0	0	29	17	17	9	38	14	**17%**	***24%***
CIF – Measles	38	9	29	0	14	0	29	17	0	0	38	0	**14%**	***18%***
CIF – Generic	13	9	14	10	0	0	29	0	0	0	13	0	**7%**	***7%***

Criteria	Babati	Dodoma R.	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total (% of facilities with each tool)	*Baseline total*
Revised weekly forms	100	100	100	100	86	100	100	83	100	64	75	100	**91%**	***65%***
Weekly data sheet	13	0	86	60	43	78	14	42	67	55	75	14	**45%**	***NA***
Revised monthly forms	88	100	100	100	86	100	86	67	100	91	75	100	**90%**	***76%***
Monthly data sheet	38	9	86	70	86	100	0	42	83	73	75	14	**55%**	***NA***
Standard case definitions poster	50	9	43	100	57	0	43	25	100	91	50	100	**53%**	***NA***
Proportion of expected tools available for each district														
FINAL	**50%**	**35%**	**56%**	**53%**	**46%**	**48%**	**46%**	**41%**	**57%**	**48%**	**60%**	**39%**	***47%***	
BASELINE	***61%***	***67%***	***41%***	***35%***	***45%***	***56%***	***54%***	***33%***	***48%***	***49%***	***39%***	***53%***	***48%***	

*CIF = Case investigation form

In addition, job aids for laboratory confirmation were developed as part of the project and the survey sought information on the availability of these job aids at the district level.[4] In the three districts that had the job aids and had used them, questions were then asked about their usefulness and whether the districts would use them again (Table 26).

Table 26: Availability and Use of Job Aids for Laboratory Confirmation by Districts

Criteria	Mbulu	Mpwapwa	Muleba	Mwanza C.	Nkasi	Total
Have job aids	X	X	X	X	X	**5**
Used job aids	X	X	X			**3**
AFP facility/district		X				**1**
Dysentery lab	X					**1**
Cholera lab	X		X			**2**
Meningitis lab	X					**1**
Measles lab	X					**1**
How to take rectal swab			X			**1**
Labeling specimens			X			**1**

[4] While the intention had been to distribute the job aids as part of district-level IDSR training that took place in 2004, logistical difficulties limited this effort. They were disseminated to the remaining districts during follow-up visits during July-August 2005. In districts where the job aids were disseminated during trainings, there were some cases of the responsible CHMT member keeping the job aids individually rather than leaving them in the District Medical Officer's office as a resource for other CHMT members.

Nkasi had not used the job aids because there had not been any suspected outbreaks during the previous quarter, while Mwanza City was not able to locate the job aids. Each of the three districts that had used the job aids stated that they had been used to help guide them in performing the specific task. They rated the usefulness of the job aids and their understanding of them as very good or excellent, and all stated that they would use them again primarily because they helped them to know that they were doing the tasks correctly.

Districts that had used the job aids were also asked whether all the resources that they needed were available to allow them to effectively use the laboratory job aids to collect and transport specimens. All three stated that they were missing resources that they needed. Mpwapwa did not have the means to travel to facilities nor the funds to collect specimens, while Mbulu was lacking reagents and Muleba did not have specimen collection supplies.

4.4.4 Feedback

It is very common for information to be passed up through the health system from facilities, through districts and regions, to the national level. Health personnel are constantly being reminded and urged to submit their data and reports. It is far less common, however, for the lower levels to hear about how their data and reports were used, whether they were of good quality, or to receive assistance based on problems identified therein. This exercise examined feedback on reports at three levels – from the MOH to the region, from the region to the district, and from the district to the health facility – each from the receiver's point of view. Four criteria were used to evaluate feedback during the previous quarter: receipt of technical information or updates on policies that related to infectious disease reporting, investigation or response (such as a technical bulletin on cholera specimen collection procedures or new reporting deadlines); receipt of reports showing data for districts/facilities combined or comparing districts/facilities; receipt of information about the quality of weekly and monthly surveillance reports submitted; and receipt of assistance in carrying out IDSR activities (such as instruction on properly completing a form during a supervision visit). In addition, health facility personnel were asked about feedback that they had provided to their communities regarding infectious diseases.

4.4.4.1 Feedback from MOH to Regions

The regions were asked whether they had received feedback from the Ministry of Health on IDSR issues during the previous quarter. Of the eight regions, only three had received feedback on new policies and guidelines, no regions had received aggregated data, one had received feedback on quality of IDSR reports, and two had received assistance on how to conduct IDSR tasks (Table 27). There has not been any significant change since the baseline assessment.

Table 27: Regions Regularly Receiving Feedback from MOH

Regions	Policies / technical updates	Aggregated or compared data	Quality of reports	Assistance with tasks
Dodoma				
Kagera	X			X
Manyara	X			
Mtwara				
Mwanza				
Rukwa				X

Regions	Policies / technical updates	Aggregated or compared data	Quality of reports	Assistance with tasks
Ruvuma				
Tabora	X		X	
TOTAL FINAL	**3**	**0**	**1**	**2**
TOTAL BASELINE	***3***	***1***	***4***	***2***

Examples of feedback received include:

- *Technical updates:* Revised weekly and monthly reporting forms (Tabora)
- *Quality of reports:* Phone comments from MOH (Tabora)
- *IDSR Assistance:* Guidelines for cholera control (Kagera) and a quarterly meeting with the EPI unit on AFP, NNT, and measles (Rukwa)

4.4.4.2 Feedback from Regions to Districts

As Table 28 shows, feedback from regions to districts was quite limited. Only three districts (Mbulu, Nkasi, and Tunduru) reported receiving two types of feedback for the quarter, while four districts did not receive any of the specified types of feedback. These results represent a decrease from the baseline, when nearly half of the criteria were met overall.

Table 28: Districts Regularly Receiving Feedback from Regions

Regions	Districts	Policies / technical updates	Aggregated or compared data	Quality of reports	Assistance with tasks	TOTAL
Dodoma	Dodoma Rural			X		1
	Mpwapwa					0
Kagera	Muleba				X	1
Manyara	Babati					0
	Mbulu	X	X			2
Mtwara	Masasi				X	1
Mwanza	Mwanza City				X	1
Rukwa	Nkasi			X	X	2
	Sumbawanga Rural				X	1
Ruvuma	Tunduru		X		X	2
Tabora	Tabora Urban					0
	Igunga					0
TOTAL FINAL		**8%**	**17%**	**17%**	**50%**	**21%**
TOTAL BASELINE		***42%***	***33%***	***58%***	***50%***	***46%***

Examples of feedback received include:

- *Aggregated/comparative data*: Mbulu received a report on vaccine-preventable diseases that

combined data from their district with data from other districts in the region. Tunduru also received verbal communication on IDSR data.

- *Quality of reports*: Dodoma Rural was informed that there was a problem with one of their monthly reports, along with instructions on how to fill it out correctly. Nkasi was advised to not rely on just one method for submitting their reports, as there were sometimes problems receiving them at the region.

- *Assistance with IDSR responsibilities*: The majority of assistance from the regions came during suspected outbreaks. Sumbawanga Rural and Muleba districts both stated that someone from the region came to assist during a cholera outbreak. Specifically, someone from the regional laboratory came to Muleba to assist with specimen collection. In Nkasi, a measles outbreak was the catalyst for regional support, while in Mwanza City the region assisted the district to obtain rabies vaccine.

4.4.4.3 Feedback from Districts to Facilities

Feedback from districts to health facilities was better than feedback from regions to districts, and slightly improved from the baseline. Overall, 37 percent of the health facilities interviewed reported that they did not receive any type of feedback (as defined above) during the preceding quarter. Table 29 shows the performance of each district in terms of the proportion of facilities that received each type of feedback.

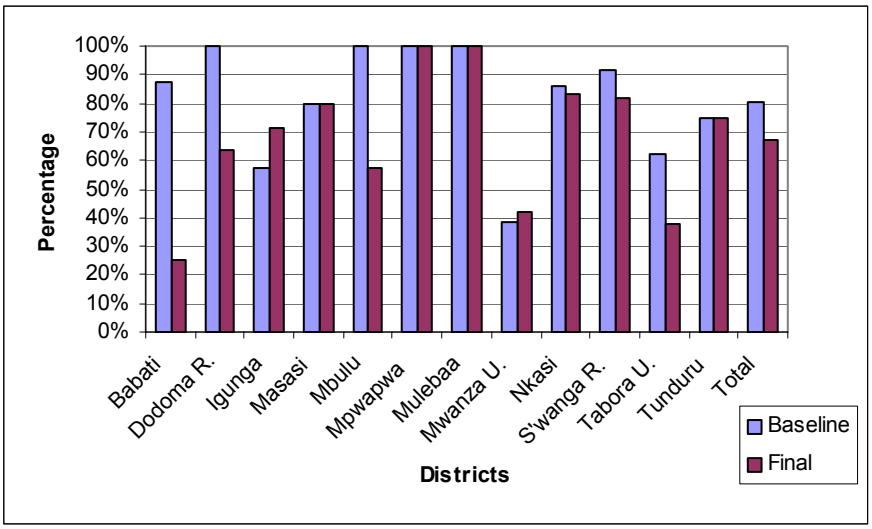
Table 29: Facilities Regularly Receiving Feedback from Districts

Districts	Policies / technical updates	Aggregated or compared data	Quality of reports	Assistance with tasks
Babati	0%	0%	0%	13%
Dodoma Rural	82%	0%	55%	36%
Igunga	100%	0%	43%	43%
Masasi	0%	30%	30%	30%
Mbulu	14%	0%	14%	43%
Mpwapwa	78%	0%	67%	11%
Muleba	83%	0%	86%	43%
Mwanza City	67%	0%	17%	42%
Nkasi	0%	0%	17%	17%
Sumbawanga R.	0%	9%	36%	36%
Tabora Urban	50%	25%	25%	50%
Tunduru	0%	0%	38%	25%
TOTAL FINAL	**40%**	**6%**	**36%**	**33%**
TOTAL BASELINE	***31%***	***7%***	***30%***	***30%***

4.4.4.4 Feedback from Facilities to Communities

Figure 7 shows the proportion of facilities in each district that, at least once during the previous quarter, provided feedback to communities related to infectious diseases that had occurred in the community. Six districts maintained or improved their performance in this area since the baseline assessment, while facilities in six districts saw decreased communication with their communities.

Figure 7: Facility Feedback to Communities on Infectious Diseases



4.4.5 Health Worker Attitudes and Motivation

A significant factor in health system performance is the attitudes of health workers towards their jobs. Appropriate knowledge, skills, and materials alone do not guarantee success. Workers who feel that they are respected and valued by their colleagues and supervisors, who feel that they are making an important contribution through their work, and who are supported in solving work-related problems are more likely to perform well. The attitude and motivation survey administered to staff at the health facilities visited addressed four areas: job satisfaction, difficulties encountered, assets that helped, and general opinion/feedback, as related to IDSR job responsibilities. Table 30 summarizes the number of survey respondents by district and facility type.

Table 30: Participation in Attitude and Motivation Survey

Districts	Dispensary	Health Center	Hospital	Total
Babati	5	5	3	**13**
Dodoma Rural	9	4	3	**16**
Igunga	4	4	1	**9**
Masasi	14	5	3	**22**
Mbulu	8	4	4	**16**
Mpwapwa	6	5	3	**14**
Muleba	4	2	3	**9**
Mwanza City	11	4	2	**17**
Nkasi	5	4	3	**12**

Districts	Dispensary	Health Center	Hospital	Total
Sumbawanga Rural	10	8	0	**18**
Tabora Urban	13	2	7	**22**
Tunduru	6	7	2	**15**
TOTAL	**95**	**54**	**34**	**183**

Health workers were asked to identify their type of profession and from the various responses they were grouped into the following six categories: clinicians (including physicians, medical officers, and clinical officers), nurses, aides/attendants, laboratory staff, health officers, and others (e.g. pharmacy technicians, medical secretaries, medical records staff). Participation by each type of health worker is presented in Table 31.

Table 31: Types of Health Workers Surveyed

Type	Number	Proportion
Clinicians	76	42%
Nurses	51	28%
Aides/Attendants	30	16%
Lab Staff	8	4%
Health Officers	11	6%
Other	7	4%
Total	**183**	**100%**

The following sections present overall results for all participants, and also highlight key results for different districts and types of health workers. Tables showing the detailed results by district and by health worker type are found in Annex F.

4.4.5.1 Job Satisfaction

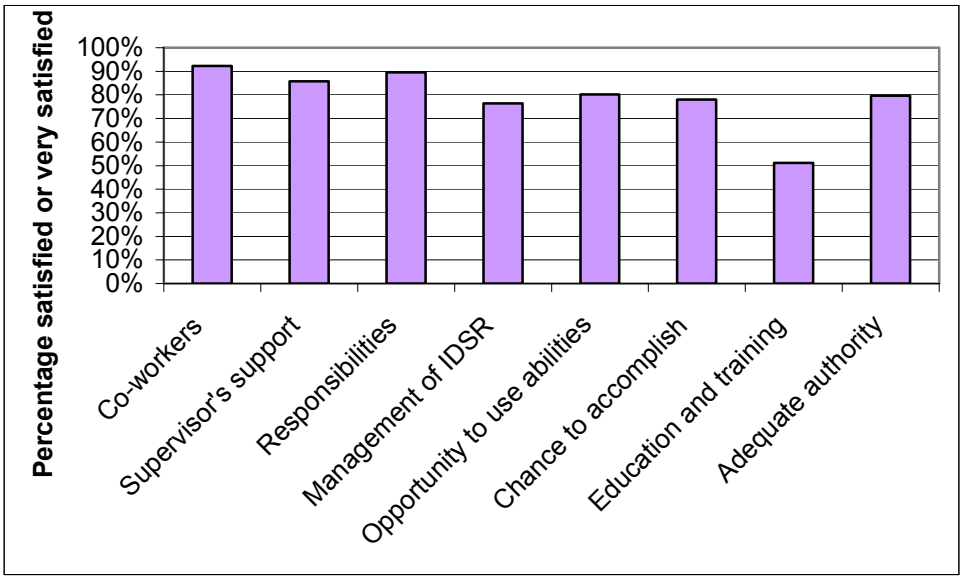
This series of questions explored health worker satisfaction in the following areas:

- Co-workers who work on IDSR activities in same work unit
- Their IDSR responsibilities
- Opportunity to utilize abilities in IDSR responsibilities
- Educational and training opportunities available in strengthening IDSR skills
- Supervisor's support on IDSR activities
- Management of IDSR activities in the district
- Chances to accomplish something valuable in IDSR responsibilities
- Given enough authority by superiors to perform IDSR responsibilities

The job satisfaction level was measured using the following scale: very unsatisfied, unsatisfied, satisfied, and very satisfied. During data analysis, it became apparent that relatively few respondents had chosen the "very" categories, so results were combined into just two categories: satisfied and unsatisfied. (This is true of all the analyses in this section.)

As shown in Figure 8, in general, health workers expressed satisfaction with their work related to IDSR. The aspect with the lowest overall satisfaction level was education and training opportunities, with just 51 percent of respondents satisfied; however, this was up from 40 percent at baseline. Satisfaction was slightly higher at follow-up compared to baseline in the following areas: co-workers, supervisory support, IDSR responsibilities, and management of IDSR activities in the district. Mpwapwa and Sumbawanga reported the highest overall job satisfaction with respect to IDSR activities (93 and 90 percent, respectively), while Tabora, Mwanza City, and Muleba reported the overall poorest job satisfaction (68 to 72 percent). Analysis by cadre showed that health officers, clinicians, and attendants had the highest overall job satisfaction (83–84 percent).

Figure 8: Level of Satisfaction with Aspects of IDSR Work



4.4.5.2 Difficulties Encountered

This section asked health workers about difficulties or obstacles encountered (if any) in carrying out IDSR tasks, specifically referring to the three-month period prior to the survey. People were asked to rate their level of agreement with the following statements, using a scale from strongly disagree to strongly agree:

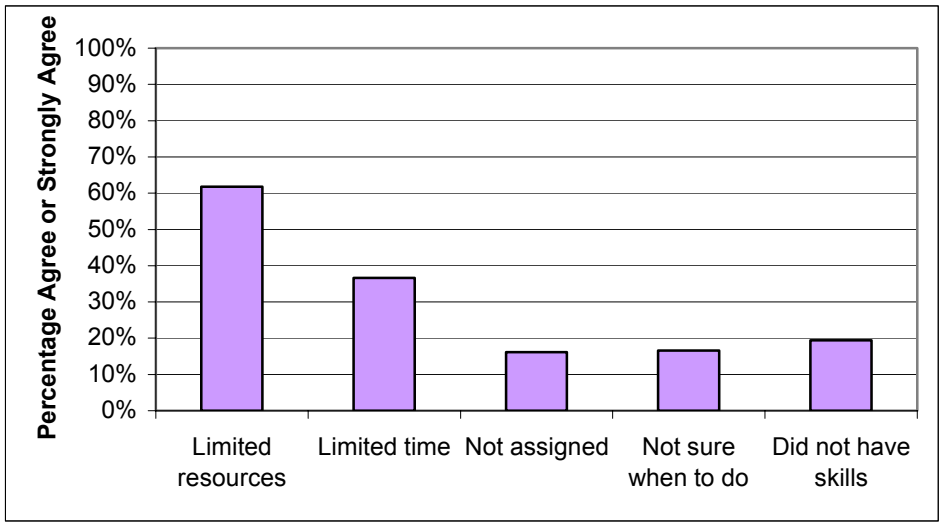
- I had limited resources for disease surveillance and response
- I had limited time for disease surveillance, due to other activities
- No one assigned me to do disease surveillance activities
- I was not sure when these tasks needed to be done
- I did not have the skills to perform IDSR tasks

The two most significant constraints that health workers reported in carrying out IDSR tasks were lack of resources (62 percent) and limited time (37 percent) (Figure 9). Only 16 percent reported that they had not been assigned to work on disease surveillance activities or that they were not sure when IDSR-related tasks needed to be done. Compared to baseline data, the only significant differences were that slightly more health workers reported limited time as a constraint during the final data collection than in

the baseline (37 percent vs. 28 percent, respectively), and fewer health workers reported being unsure of when the tasks needed to be done (16 percent at final interview compared to 23 percent at baseline).

Masasi, Mwanza City, and Tabora Urban respondents agreed most often that they faced the constraints posed in the statements above (37–38 percent), while Dodoma and Mpwapwa districts had the fewest respondents who agreed with the statements (20 percent). Among the different categories of health workers interviewed, not including the "other" category, laboratory staff were most likely to agree that constraints hindered their ability to do IDSR work; however, the proportion reporting that they strongly agreed with the constraints statements declined from 70 percent at baseline to 40 percent at follow-up. The primary constraints cited by laboratory staff were that they were not assigned to carry out IDSR activities or that they had limited resources. As in the baseline survey, health officers and clinicians (22 and 24 percent, respectively) were least likely to report that these constraints made it difficult for them to do their jobs.

Figure 9: Difficulties Encountered in Carrying Out IDSR



4.4.5.3 Assets that Help

The same agreement scale was used to assess things that were most helpful in performing monitoring and reporting tasks. Parameters used include the following:

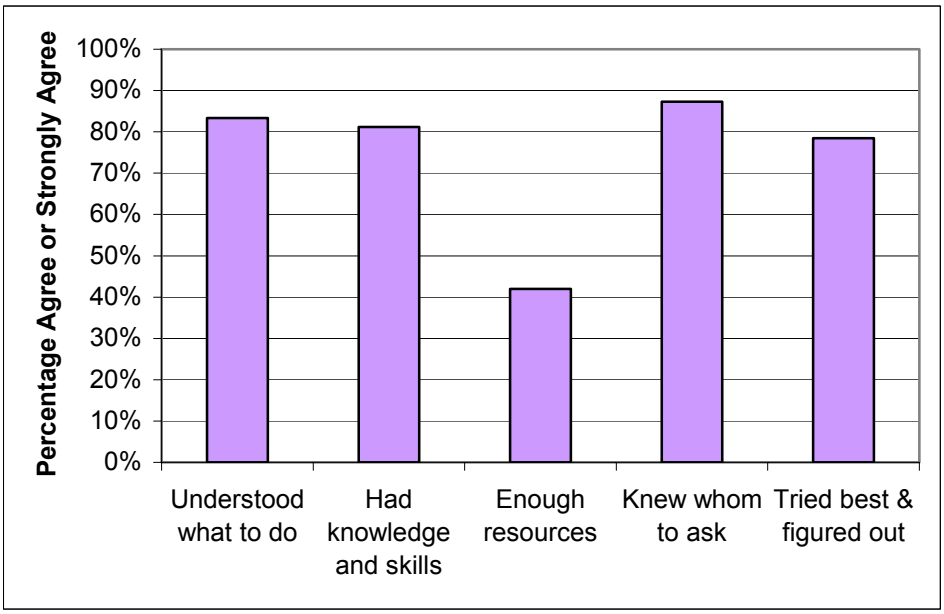
- I clearly understood what had to be done for surveillance
- I had the knowledge and skills to do the surveillance and response tasks required
- I had enough resources to get the work done
- I knew whom to ask if I had questions or problems
- Even when I was not sure, I tried my best and figured out what to do

As shown in Figure 10, most health workers reported that they clearly understood what had to be done for surveillance, that they knew whom to ask if they had problems or questions, and that they had the knowledge and skills required to do their jobs (82 percent, 87 percent, and 81 percent, respectively). Even when they did not know what to do, 78 percent reported that they tried their best to figure it out, indicating motivation to complete their IDSR work appropriately. However, the only item that showed a

significant increase from the baseline survey was the proportion reporting that they had enough resources to get the work done (42 percent compared to 33 percent at baseline).

Health staff from Tabora Urban and Mwanza City cited the fewest assets (65 percent and 70 percent, respectively) that helped with performing monitoring and reporting tasks, while Mpwapwa and Babati cited the most (84 and 83 percent, respectively). Laboratory staff reported having the most assets (90 percent), compared to the baseline survey when they reported having the fewest assests. Of all the categories of health workers, nurses were least likely to agree that they had the assets listed to help them do their IDSR-related work (64 percent).

Figure 10: Assets that Help in Carrying Out IDSR



4.4.5.4 General Opinion and Feedback

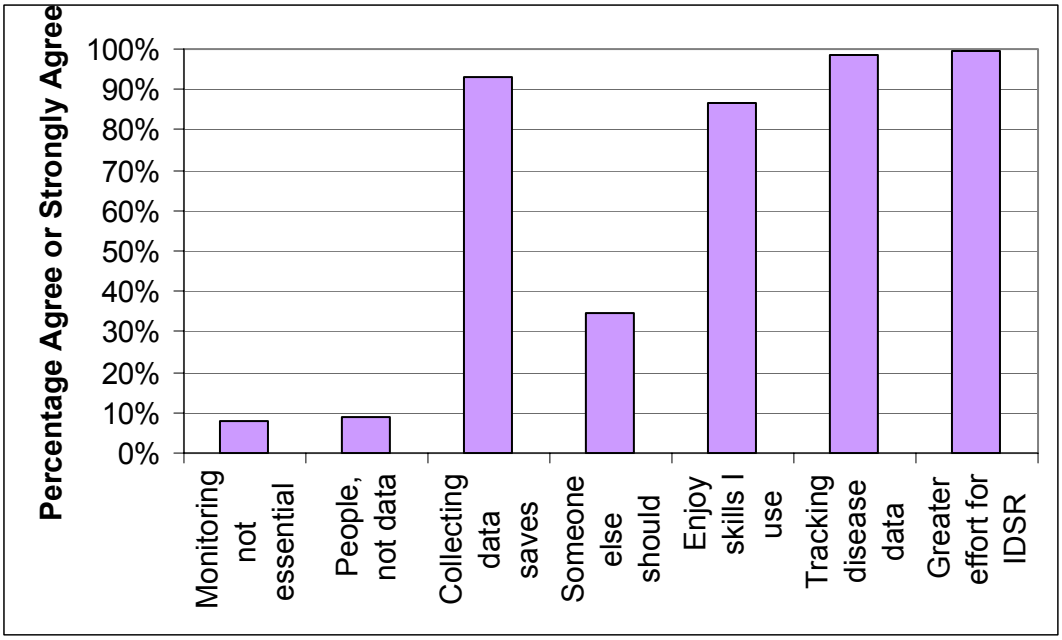
Health workers were asked to give their opinions on several issues concerning disease surveillance. The set of questions addressed their perceptions about the importance of surveillance within the health system, who should be responsible for surveillance tasks, and their motivation for carrying out these tasks. Respondents were asked to rate their level of agreement with the following statements:

- Monitoring diseases is not an essential part of my work
- My real job is taking care of people, not collecting data
- Collecting data and sending it on to the district can help save lives
- Someone else should be hired and responsible for collecting data on diseases
- I enjoy the skills I use when I collect and graph disease data
- Tracking disease data and reporting it to the district is an important responsibility for my facility
- I am willing to put in greater effort than normally expected in order to ensure that the IDSR work at this facility is successful

Nearly all health workers stated that they were willing to put in a greater effort than normally expected to ensure that IDSR work at the facility is successful and that tracking disease data is an

important responsibility for the facility (99 percent and 98 percent, respectively) (Figure 11). In addition, most (93 percent) respondents stated that they agreed that collecting data and sending it to the district saves lives. These numbers remain similar to the baseline survey findings. The proportion of health workers stating that they agreed that someone else should be hired and responsible for collecting surveillance data rose from 24 percent at baseline to 35 percent at the final data collection, with health staff from Igunga, Tabora, and Muleba most likely to agree with this statement. Interestingly, Igunga and Muleba staff were also most likely to share this sentiment at the baseline. Just 8 percent of all health staff felt that their job was to take care of people, not data; this was most commonly noted by laboratory staff (38 percent), though it should be noted that the total number of laboratory staff interviewed was quite small.

Figure 11: Opinions from Health Workers on IDSR



4.4.6 Knowledge and Skills Assessment

The final M&E exercise also included an assessment of IDSR knowledge and skills at both the district and facility levels. The tools were the same as those used for pre- and post-testing during IDSR training at each level. The purpose was to measure retention following the training, and to identify areas that require further strengthening. Results for each level are presented in the following sections.

4.4.5.4 District Knowledge and Skills

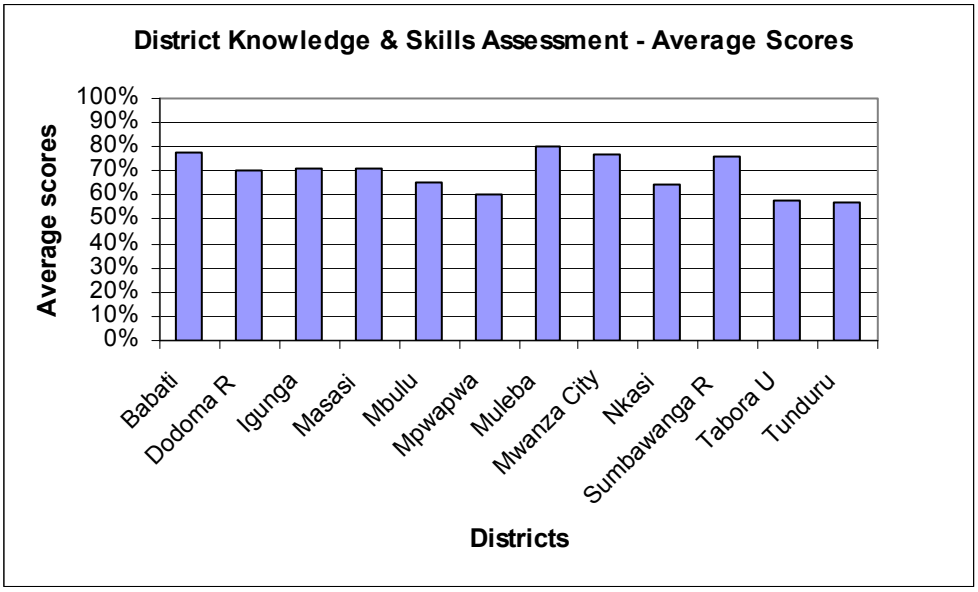
A total of 80 CHMT members participated in the knowledge and skills assessment (Table 32). Of these participants, 27 identified themselves as the district medical officer, district health officer, or IDSR focal person; the remaining 53 held other positions at the district. Just over 60 percent of the respondents had participated in the district-level IDSR training sessions held in 2004. The district-level assessment consisted of 15 questions.

Table 32: Participation in District Knowledge and Skills Assessment

Districts	N	% of Total	N (%) Trained
Babati	**4**	5.0	3 (75%)
Dodoma Rural	**6**	7.5	4 (67%)
Igunga	**8**	10.0	6 (75%)
Masasi	**8**	10.0	5 (63%)
Mbulu	**6**	7.5	5 (83%)
Mpwapwa	**4**	5.0	3 (75%)
Muleba	**5**	6.3	5 (100%)
Mwanza City	**10**	12.5	8 (80%)
Nkasi	**6**	7.5	2 (33%)
Sumbawanga Rural	**3**	3.8	3 (100%)
Tabora Urban	**10**	12.5	2 (20%)
Tunduru	**10**	12.5	3 (30%)
TOTAL	**80**	**100**	**49 (61%)**

The combined average assessment score for all districts was 69 percent. Tunduru had the lowest average score at 57 percent, while Muleba had the highest average score at 80 percent (Figure 12). Mpwapwa and Muleba districts had the most consistent scores among respondents, with 6 and 12 percentage points separating the lowest and highest scores, respectively. The greatest range was seen in Igunga, with a low score of 14 percent and a high score of 95 percent.

Figure 12: District Knowledge and Skills Assessment Results, by District



Results of the assessments were analyzed by question in order to identify the areas where respondents performed best and weaker areas that might be addressed in follow-up with districts. Table 33 shows the questions that had the best results, including the proportion of respondents who received maximum credit for each, and the questions with poorest performances, along with the proportion that received no credit for each. Strong areas included knowledge of the purpose and analysis of IDSR data, and elements of outbreak investigations. The questions that posed difficulties for the greatest number of

respondents were related to listing IDSR indicators, explaining the purpose of standard case definitions, interpreting data on a graph, and calculating CFR based on data provided.

Table 33: Areas of Strength and Weakness, District Knowledge & Skills Assessment

Question	% of respondents receiving:
Areas of high performance	**Maximum credit**
What is the primary purpose for collecting integrated surveillance data?	84
What are the most important types of analysis used in integrated disease surveillance and response?	83
When should an investigation be conducted?	79
When should the district outbreak management committee meet?	75
Areas of low performance	**Minimum credit**
List three indicators that the CHMT should be monitoring on a regular basis in order to respond to and understand better the functioning of the system.	41
For each of the following diseases, circle the letter next to the correct standard case definition (cholera and uncomplicated malaria).	45
Write a brief interpretation of the data shown in the graph you drew.	45
Using the data above, calculate the case fatality rate for December.	53

The assessment data were further analyzed according to the training status of the respondents. As might be expected, those who had participated in the district-level IDSR training performed better than those who had not. As Table 34 shows, all of the respondents who achieved an overall score of 80 percent or better had been trained, while three-quarters of those who scored 66 percent or better had been trained. The average overall score for trained respondents was 74 percent, while the average score for untrained respondents was 59 percent.

Table 34: Summary of Assessment Scores by Training Status

Score range	% of respondents trained
10% - 50%	0%
51% - 65%	37%
66% - 79%	76%
80% - 95%	100%

4.4.5.5 Facility Knowledge and Skills Assessment

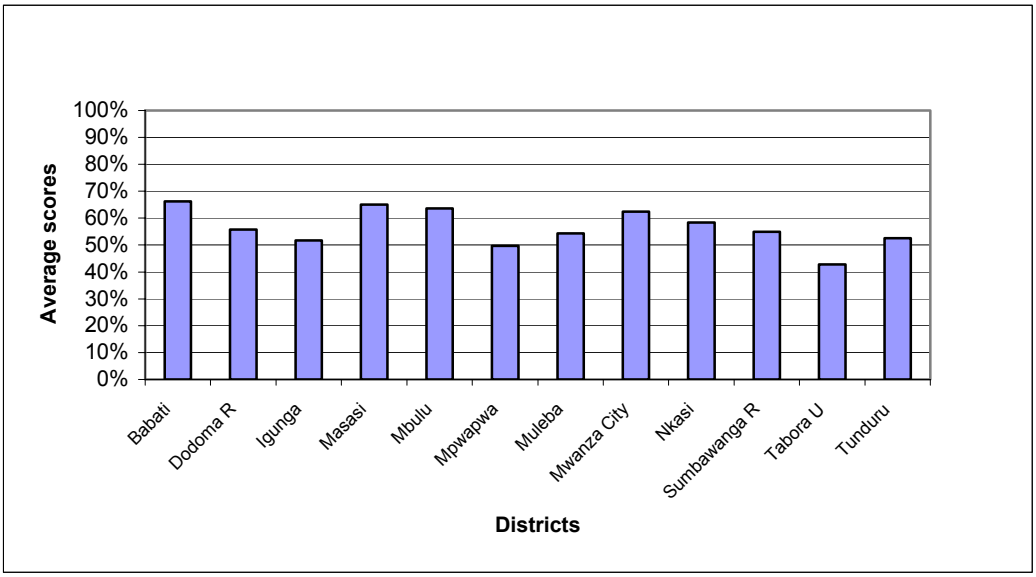
A total of 180 health facility staff participated in the assessment (Table 35). Of these participants, 75 identified themselves as being clinicians, 40 were nurses, and 14 were health officers. The remainder were attendants, laboratory staff. or others. Just over half of the respondents were from the dispensary level, while 30 percent worked at health centers and 18 percent at hospitals. Similar to the district level, 58 percent of the respondents had participated in the facility-level IDSR training sessions held in 2004 or early 2005. The facility level assessment consisted of 22 questions.

Table 35: Participation in Facility Knowledge and Skills Assessment

Districts	N	% of Total	N (%) Trained
Babati	**14**	7.8	9 (64%)
Dodoma Rural	**15**	8.3	10 (67%)
Igunga	**22**	12.2	11 (50%)
Masasi	**13**	7.2	9 (69%)
Mbulu	**17**	9.4	11 (65%)
Mpwapwa	**16**	8.9	9 (56%)
Muleba	**16**	8.9	10 (63%)
Mwanza City	**15**	8.3	11 (73%)
Nkasi	**15**	8.3	10 (67%)
Sumbawanga Rural	**9**	5.0	4 (44%)
Tabora Urban	**19**	10.6	4 (21%)
Tunduru	**9**	5.0	6 (67%)
TOTAL	**180**	**100**	**104 (58%)**

The combined average assessment score for facilities in all districts was 56 percent (Figure 13). Analysis of the results by district shows that facilities in Tabora Urban had the lowest average score at 43 percent, while Babati, Masasi, and Mbulu had the highest average scores at 66, 65, and 64 percent, respectively. Masasi, and Sumbawanga districts had the most consistent scores among respondents, with 41 percentage points separating the lowest and highest scores in each district. The greatest range was seen in Babati, with a low score of 23 percent and a high score of 95 percent.

Figure 13. Facility Knowledge and Skills Assessment Results, by District



Results of the assessments were analyzed by question in order to identify the areas where respondents performed best and weaker areas that might be addressed in follow-up with facilities. Table 36 shows the questions that had the best results, including the proportion of respondents who received maximum credit for each, and the questions with poorest performances, along with the proportion that

received no credit for each. Strongest areas included knowledge of outbreak management and understanding of the term "zero reporting." The questions that posed difficulties for the greatest number of respondents were related to working with the community and drawing different types of graphs for data presentation.

Table 36: Areas of Strength and Weakness, Facility Knowledge and Skills Assessment

Question	% of respondents receiving:
Areas of high performance	**Maximum credit**
Imagine there is a cholera outbreak in your ward, and that your villages are involved. Circle one most appropriate sequential order of actions that you would take if you were in charge of the health facility.	66
In data management, what comes first: analysis or interpretation?	66
In the case of a cholera outbreak, what information listed below would you need to report to your district medical officer?	61
Circle the correct meaning of the term "zero reporting" as used in IDSR.	58
Areas of low performance	**Minimum credit**
List five actors that you think you can work with to strengthen surveillance at community level.	51
Write down five different ways that can be used to communicate the surveillance information to the community.	53
List two differences between weekly and monthly report forms.	65
Sketch a line graph, bar graph and histogram.	92

The assessment data were further analyzed according to the training status of the respondents. As might be expected, those who had participated in the facility-level IDSR training performed better than those who had not. As Table 37 shows, virtually all of the respondents who achieved an overall score of 80 percent or better had been trained, while two-thirds of those who scored 66 percent or better had been trained. The average overall score for trained respondents was 64 percent, while the average score for respondents who had not participated in IDSR training was 45 percent. Scores were consistent across the three facility levels with an average score of 55 percent for dispensaries, 57 percent for health centres and 59 percent for hospitals.

Table 37: Summary of Assessment Scores by Training Status

Score range	% of respondents trained
10% - 50%	17%
51% - 65%	46%
66% - 79%	66%
80% - 95%	96%

Finally, comparisons were made with data from the post-tests that were administered following the facility-level training. As Table 38 illustrates, four districts showed slightly improved performance, three districts showed slight decreases, and four districts had decreases of more than 10 percentage points. No post-test data were available for facilities in Igunga district. The decreases seen in several districts likely reflect the expected drop in retention as time since training increases. In addition, inadequate follow-up and supportive supervision following the training may have contributed to poor performance in some districts. It is also important to note that changes in district personnel between training and this follow-up

assessment may have also contributed to apparently declining scores in some districts, as the M&E assessment included a significant number of staff who had not participated in the IDSR training.

Table 38: Changes in Facility Level Assessment Performance

Districts	Training Post-Test	M&E Assessment	Difference
Mpwapwa	46%	50%	4%
Mwanza City	59%	62%	3%
Mbulu	61%	64%	3%
Babati	64%	66%	2%
Dodoma Rural	57%	56%	-1%
Masasi	69%	65%	-4%
Muleba	62%	54%	-8%
Nkasi	71%	58%	-13%
Sumbawanga Rural	69%	55%	-14%
Tunduru	76%	53%	-23%
Tabora Urban	74%	43%	-31%
TOTAL	65%	56%	-9%

5. Conclusions

This follow-up monitoring and evaluation exercise provided an opportunity to examine IDSR system performance after the introduction of several interventions (training, job aids, etc.) meant to address gaps identified during the 2002 situation analysis and the 2004 baseline monitoring and evaluation exercise. As expected, the data demonstrated that improvements have been made in several areas, while weaknesses still exist. This section summarizes the strengths and challenges remaining in project districts after implementation of several IDSR strengthening activities, and discusses next step to continue to improve upon the strong foundation currently in place in these districts.

5.1 Strengths

- **Reporting:** Timeliness and completeness of weekly and monthly reports increased substantially at follow-up, with a few districts exceeding performance targets and most steadily approaching these targets. However, a few districts continued to lag behind, and additional efforts will be needed to assist them to improve. Accuracy of reported cases (facility reports compared to district reports) improved for all diseases at follow-up.
- **Outbreak management:** As in the baseline, overall outbreak management performance was strong, as this is the component of IDSR that is most familiar to district health management teams. Overall performance remained fairly similar from the baseline to the follow-up period.
- **Planning and monitoring based on data:** All districts reported having used data to plan and monitor, and were able to provide examples. The challenge now will be to continue working to improve accuracy, timeliness, and completeness of IDSR data so that districts can be confident that they are using high quality data in their planning and monitoring processes.
- **Linkages within and outside the health sector:** Districts continued to perform quite strongly in coordinating and communicating with partners and stakeholders.

5.2 Challenges

- **Case investigation forms:** Compared to baseline, use of CIFs improved; however, there is still substantial room for improvement in this area.
- **Data analysis at districts and facilities:** The proportion of facilities and districts doing recommended analyses (monthly and long-term malaria trends for cases in children under the age of five years) improved dramatically from baseline to follow up. However, most districts facilities are still not conducting regular analyses of data. Further attention to strengthening facility and district-level capacity in data analysis and use is required.

- **Outbreak preparedness:** Overall scores for the elements of outbreak preparedness declined from baseline levels. This may reflect the fact that the project conducted epidemic preparedness workshops in all districts before the baseline M&E exercise, but that there was no specific follow-up in this area.

- **Outbreak management:** Despite strong performance overall in outbreak management, there were a few discrepancies between regions and districts in terms of their records of whether any outbreaks had occurred during the previous quarter.

- **Case management during outbreaks:** High CFRs for cholera and meningitis suggest the need for improvement of case management for these diseases. However, it should be noted that these data are based on a relatively small number of cases and outbreaks during the time period of interest.

- **Feedback:** Feedback from the regions to the districts actually declined from baseline levels; feedback from districts to facilities improved very slightly, and feedback from facilities to communities declined slightly. Feedback is an essential tool to help encourage and maintain reporting, and thus its improvement is required to continue to improve IDSR system performance.

5.3 Conclusions and Next Steps

Results from this follow-up M&E activity have provided useful information regarding current weaknesses and strengths of the IDSR system in 12 districts of Tanzania. The project's interventions in the areas of training, follow-up/supportive supervision, and introduction of tools and job aids may have contributed to improvements in several aspects of IDSR performance, including reporting, data analysis at facilities and districts, and increased use of data for planning and monitoring. However, given the varying amounts of time that the 12 districts had to use these tools before the follow-up data collection, and high staff turnover between baseline and follow-up, it is difficult to attribute any specific improvements to the overall intervention package. However, while comparisons with baseline measurements demonstrated significant positive changes in these areas, there are many additional elements that will require additional support to meet performance targets.

These results indicate that intense training and development and dissemination of tools and job aids is an important first step in addressing weaknesses in IDSR system performance, and these types of interventions can contribute to relatively quick short-term improvements in key areas. However, continued support over a longer period of time will be needed to ensure that health workers and health management teams have the tools and skills needed to improve and maintain IDSR performance. In addition, districts will require support to continue to monitor their own IDSR performance and make adjustments as needed. All Council Health Management Team members have now been introduced to key IDSR indicators and the importance of monitoring and evaluating to improve system performance, and tools have been disseminated to assist districts with these tasks. This is just a first step in an ongoing and long-term process to strengthen IDSR. Competing priorities and lack of dedicated time and funding often make it a challenge for districts to find the time to conduct these exercises on a regular basis. With the completion of this IDSR strengthening project, the national and regional levels will be instrumental in ensuring the continuation of monitoring and IDSR strengthening throughout the project districts as well as in other districts in Tanzania.

Annex A. IDSR Indicators

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
	REGION						
1.	Feedback on region reports from MOH	Proportion of regions receiving feedback from MOH	Number of regions that have received feedback from MOH (measured by checklist)	Total number of regions	Quarterly	Interviews at region	Providing information related to IDSR (new policy, other report) Aggregated data Feedback on quality of IDSR reporting Assistance with IDSR tasks
2.	Accuracy of reporting to the region	Proportion of monthly district reports that have accurate information	Total number of monthly district reports that have accurate information	Total number of monthly district reports	Quarterly	Monthly report forms, reporting logbook	
3.	Surveillance monitoring	Proportion of regions that know and review their IDSR indicators, and take action as a result	Number of regions that know and review their IDSR indicators, and take action as a result (measured by checklist)	Total number of regions	Quarterly	Interviews at region	Know IDSR indicators Review indicators Take action based on review
4.	Timeliness of reporting to the region	Proportion of weekly district reports received by region on time	Total number of weekly district reports received by region on time	Total number of weekly district reports expected by the region	Reviewed monthly, reported quarterly	Report logbook or actual reports	
5.		Proportion of monthly district reports received by region on time	Total number of monthly district reports received by region on time	Total number of monthly district reports expected by the region	Quarterly	Report logbook or actual reports	
6.	Complete coverage of district reporting to the region	Proportion of expected weekly district reports that are received by region	Total number of weekly district reports that are received by region	Total number of expected weekly district reports	Monthly	Report logbook, or actual reports	

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
7.		Proportion of expected monthly district reports that are received by region	Total number of monthly district reports that are received by region	Total number of expected monthly district reports	Quarterly	Report logbook, or actual reports	
8.	Response to outbreaks	Proportion of regions that participated in investigation and response for outbreaks in IDSR project districts	Total number of regions that participated in investigation and response for outbreaks in IDSR project districts	Total number of regions	Quarterly	Interviews at region	
	DISTRICT						
9.	Feedback on district reports from region	Proportion of districts receiving feedback from regions	Number of districts that have received feedback from regions (measured by checklist)	Total number of districts	Quarterly	Interviews at district Record review	Providing information related to IDSR (new policy, other report) Aggregated data Feedback on quality of IDSR reporting Assistance with IDSR tasks
10.	Communication and coordination within and outside the health sector	Proportion of districts that communicate and coordinate with other sectors and other health programs	Number of districts that communicate and coordinate with other sectors and other health programs (measured by checklist)	Total number of districts	Semi-annually	Interview with district team	Data shared with others Resources coordinated Prevention activities with support from others Invite others to IDSR meetings
11.	Outbreak preparedness	Proportion of districts with up-to-date district epidemic preparedness plan that includes essential elements	Number of districts with up-to-date district epidemic preparedness plan that includes essential elements (measured by checklist)	Total number of districts reviewed	Annually	Epidemic preparedness plans	Plan exists Plan includes essential elements Plan has been written/ updated in past 2 years

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
12.	Evaluation of outbreak management	Proportion of outbreaks for which the district team evaluates their management and proposes solutions	Number of outbreaks that for which the district team evaluates their management and proposes solutions (measured by checklist)	Total number of outbreaks	Semi-annually	Interview with district team	Review response Make recommendations for improvement Implement recommendations
13.	IDSR activity planning	Proportion of districts with IDSR activities included in district health plans	Number of districts with IDSR activities included in district health plans (measured by checklist)	Total number districts reviewed	Annually	Comprehensive Council Health Plan	Supervision Quarterly review meetings Training activities Prevention activities
14.	Implementation of IDSR activities	Proportion of districts implementing IDSR activities	Number of districts implementing IDSR activities (measured by checklist)	Total number of districts reviewed	Semi-annually	Interview with district team, activity reports, checklists	Supervision Quarterly review meetings Training activities Prevention activities
15.	Surveillance monitoring	Proportion of districts that collect and review their IDSR indicators at least once during the last three months and take actions as a result	Number of districts that collect and review their IDSR indicators at least once during the last three months and take actions as a result	Total number of districts reviewed	Quarterly	Interview with district team	Know IDSR indicators Review indicators Take action based on review
16.	Planning and implementation based on data	Proportion of districts whose plans and actions are based on IDSR data	Number of districts planning and implementing activities using data (measured by checklist)	Number of districts reviewed	Semi-annually in the first year Annually	Interview with district team	Actions based on data Follow-up /monitoring based on data
17.	Timeliness of facility reporting to the district	Proportion of weekly facility reports received by district on time	Total number of weekly health facility reports received on time by the district	Total number of weekly health facility reports expected by the district	Reviewed monthly, reported quarterly	Report logbook, or actual reports	

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
18.		Proportion of monthly facility reports received by district on time	Total number of monthly health facility reports received on time by the district	Total number of monthly health facility reports expected by the district	Quarterly	Report logbook, or actual reports	
19.	Reporting of priority diseases using case-investigation forms	Proportion of cases of each disease reported to the district using case investigation forms	Total cases of priority disease reported to district using case investigation forms	Total cases of suspected priority diseases reported to the district	Quarterly	(IDSR Forms 6-8, 10), weekly health facility reports	Diseases requiring case investigation forms: AFP, NNT, measles, meningitis, cholera, plague, yellow fever
20.	Complete coverage of facility reporting to the district	Proportion of expected weekly health facility reports that are received by district	Total number of weekly health facility reports that are received by district	Total number of expected weekly health facility reports	Monthly	Report logbook, or actual reports	
21.		Proportion of expected monthly health facility reports that are received by district	Total number of monthly health facility reports that are received by district	Total number of expected monthly health facility reports	Quarterly	Report logbook, or actual reports	
22.	Effective laboratory confirmation process	Proportion of suspected outbreaks of epidemic-prone disease in which specimen collection and laboratory confirmation are completed according to guidelines	Total number of suspected outbreaks of epidemic-prone disease in which specimen collection and laboratory confirmation procedures are followed (as measured by checklist score)	Total number of suspected outbreaks of epidemic-prone disease	Quarterly	Interview with district team Outbreak investigation report Interview with referral laboratory personnel	Appropriate number of samples taken Appropriate handling & transportation of samples Samples sent to appropriate lab Samples accompanied by appropriate documentation Samples sent within appropriate timeframe Lab confirmation received

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
23.	Appropriate investigation of suspected outbreaks	Proportion of suspected outbreaks of epidemic-prone disease that are investigated according to guidelines	Total number of suspected outbreaks of epidemic-prone disease that are investigated according to guidelines (as measured by checklist score)	Total number of suspected outbreaks of epidemic-prone disease	Quarterly	Log of suspected outbreaks and rumors Outbreak investigation report	Verification Timely notification Preparation Confirm diagnosis Search for additional cases Collect information Compile and analyze data (including CFR)
24.	Appropriate response to confirmed outbreaks	Proportion of confirmed outbreaks of epidemic-prone disease with appropriate response according to guidelines	Total number of confirmed outbreaks of epidemic-prone disease with recommended response according to guidelines (as measured by checklist score)	Total number of confirmed outbreaks	Quarterly	Outbreak response report	CHMT meets Response based on data Inform and educate community Disease-specific actions (immunization, safe water, vectors…) Outbreak report includes case-based data
25.	Quality of case management and surveillance activities	Case fatality rate for each epidemic-prone disease reported	Total number of deaths reported from epidemic-prone disease outbreaks	Total number of cases reported from the epidemic-prone disease outbreak	Quarterly/ Annually	Weekly facility reports	Cholera Meningitis Yellow fever
26.	Routine analysis of data	Proportion of districts with current trend analysis (line/bar graphs) for selected priority diseases	Total number of districts with current line/bar graphs for selected priority diseases	Total number of districts	Quarterly	Graphs displayed / available at district office	Monthly malaria inpatient cases and deaths in children <5 Long-term trend analysis of malaria in children <5
	FACILITY						
27.	Accuracy of reporting to the district	Proportion of monthly health facility reports that have accurate information	Number of monthly health facility reports that have accurate information	Number of monthly health facility reports	Quarterly	Facility register review and monthly reports submitted to district	

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
28.	Feedback on facility reports from district	Proportion of facilities receiving feedback from the district	Number of facilities receiving feedback from the district (measured by checklist)	Total number of health facilities reviewed	Quarterly	Interview with health facility personnel	Providing information related to IDSR (new policy, other report) Aggregated data Feedback on quality of IDSR reporting Assistance with IDSR tasks
29.	Availability of tools / job aids for IDSR	Proportion of health facilities that have at least 3 of the 5 IDSR tools/job aids	Number of health facilities that have specified job aids (measured by checklist)	Total number of health facilities reviewed	Semi-annually or quarterly	Interview with facility staff, document review	Clinic register (MTUHA Book 5) Case investigation forms (Forms 6, 7, 8, 10) Weekly report forms (Form 3b) Monthly report forms (Form 2b) Copy of standard case definitions
30.	Health worker knowledge and skills.	Proportion of health workers who score at least 70% on IDSR knowledge test	Number of health workers who score at least 70%	Total number of health workers who take test	Each training Final data collection	Pre-/post-test	
31.	Health worker attitudes toward performing IDSR tasks	Average score on attitude and motivation questionnaire			Semi-annually	Self-administered survey	
32.	Feedback to communities on IDSR	Proportion of health facilities that provide feedback to local communities regarding infectious diseases	Number of health facilities that provide feedback to local communities regarding infectious diseases	Total number of facilities reviewed	Quarterly	Interview with health facility personnel	

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
33.	Routine analysis of data	Proportion of facilities with current trend analysis (line graphs) for selected priority diseases	Total number of facilities with current line graphs for selected priority diseases	Total number of facilities	Quarterly	Graphs displayed / available at facility	Monthly malaria inpatient cases and deaths in children <5 Long-term trend analysis of malaria in children <5

Annex B. Health Facilities Visited

District	Hospital	Health Centers	Dispensaries
Babati	Babati (District Hospital)	Magugu Buma (Bashnet)	Mamire Bonga Gallappo Dareda Kati Mwada
Dodoma Rural	Mvumi Mission	Chamwino Haneti	Bahi Government Humekwa Isangha Kigwe Manzase Mlowa Barabarani Nmkola Nkome
Igunga	Igunga (District Hospital)	Ussongo HC	Choma Wazazi Tambale Itumba Ziba
Masasi	Mkomaindo (District Hospital)	Chiwale Nagaga	Mumbaka Nanyindwa Lukuledi Maratani Likokona Nanganga Memo
Mbulu	Mbulu (District Hospital)	Dongobesh St. Alois (Endahagchan)	Daudi Labay Pentecoste Murray Yaeda Chini
Mpwapwa	William Benjamin Mkapa (District Hospital)	Kibakwe Rudi	Chogolo Chunyu Ipera Pwaga St. Lukes Wiyenzele
Muleba	Rubya (District Designated Hospital)	Kimeya Kaigara	Kagoma Karambi Kolping Kishuro Omuronazi
Mwanza City	Seko-Toure (Regional Hospital)	Al-Ijumaa HC Karume HC	Amani Chogo Corner Huruma Kahama Kirumba Nyakahoja Butimba Prison Bwiru Boys TMC Mkuyuni Sangabuye

District	Hospital	Health Centers	Dispensaries
Nkasi	Namanyere (District Designated Hospital)	Kirando Kilangala	Chala Katani Mandakerenge Ntuchi
Sumbawanga Rural		Mtowisa Laela	Muze Mpui Mnokola Mititi Msanzi Mbuza Kisumba Kasanga Kaengesa Ulumi
Tabora Urban	Kitete (Regional Hospital)	Bakwata	Arthi Ipuli Kalunde Ndevelwa Isevya Ng'ambo
Tunduru	Tunduru (District Hospital)	Nakapanya Mkasale	Ligoma Nandembo Azimio Ligunga Tunduru Private

Annex C. Summary Results for All Indicators – Region, District, and Facility

Region Indicators		Dodoma	Kagera	Manyara	Mtwara*	Mwanza	Rukwa	Ruvuma	Tabora
Reporting	Timeliness of weekly reporting to region	100%	60%	91%	--	80%	95%	100%	87%
	Timeliness of monthly reporting to region	40%	0%	100%	--	14%	92%	67%	94%
	Completeness of weekly reporting to region	100%	92%	91%	--	92%	100%	100%	100%
	Completeness of monthly reporting to region	93%	83%	100%	--	57%	100%	100%	100%
Use of Surveillance Data	Surveillance monitoring (score of 3)	1	0	1	--	1	0	1	0
Outbreak Management	Investigation of and response to outbreaks (score of 2)	NA	2	NA	--	NA	2	NA	NA
Management of IDSR System	Feedback to regions from MOH (score of 4)	0	2	1	--	1	1	0	2

*Regional indicators could not be collected from Mtwara (Masasi district) because the IDSR focal person was not available.

District Indicators		Babati	Dodoma Rural	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza City	Nkasi	S'wanga Rural	Tabora Urban	Tunduru
Reporting	Accuracy of district reports to region	97%	68%	65%	76%	97%	71%	59%	71%	82%	71%	65%	85%
	Timeliness of weekly reporting to region	63%	97%	14%	91%	68%	67%	16%	17%	55%	50%	14%	51%
	Timeliness of monthly reporting to region	61%	74%	58%	89%	68%	78%	42%	6%	75%	55%	8%	73%
	Completeness of weekly reporting to region	66%	100%	58%	93%	75%	67%	40%	33%	82%	80%	26%	76%
	Completeness of monthly reporting to region	66%	86%	77%	90%	77%	87%	64%	27%	95%	95%	10%	73%
	Reporting of priority diseases using case investigation forms	NA	NA	0%	11%	NA	NA	18%	NA	NA	4%	NA	0%
Use of Surveillance Data	Routine analysis of data (score of 3)	3	0	3	0	3	3	3	0	2	2	0	0
	Surveillance monitoring (score of 3)	1	3	2	3	1	1	1	0	1	1	2	2
	Planning and monitoring based on data (score of 2)	1	2	2	2	2	2	2	2	1	1	2	2
Outbreak Management	Appropriate investigation of suspected outbreaks	NA	NA	NA	88%	NA	NA	88%	63%	NA	100%	NA	75%
	Effective laboratory confirmation process	NA	NA	NA	100%	NA	NA	100%	No data	NA	83%	NA	67%

District Indicators		Babati	Dodoma Rural	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza City	Nkasi	S'wanga Rural	Tabora Urban	Tunduru
	Appropriate response to confirmed outbreaks	NA	NA	NA	60%	NA	NA	100%	80%	NA	100%	NA	60%
	Outbreak preparedness (score of 6)	8	2	7	0	8	2	8	0	5	8	0	8
	Evaluation of outbreak management (score of 3)	NA	NA	NA	1	NA	NA	0	0	NA	0	NA	2
	CFR Cholera	NA	NA	NA	NA	NA	NA	6.7%	NA	NA	11.1%	NA	NA
	CFR Meningitis	NA	NA	0%	33.3%	NA	NA	33.3%	NA	NA	NA	NA	28.6%
Management of IDSR System	Feedback to districts from region (score of 4)	0	1	0	1	2	0	1	1	2	1	0	2
	Communication and coordination within and outside health sector (score of 4)	1	4	4	4	0	2	4	4	3	4	4	3
	IDSR activity planning (score of 4)	2	3	4	4	2	4	4	3	3	4	4	4
	Implementation of IDSR activities (score of 4)	0	3	4	3	0	2	3	4	2	1	3	4

Facility Indicators		Babati	Dodoma Rural	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza City	Nkasi	S'wanga Rural	Tabora Urban	Tunduru
Reporting	Accuracy of facility reports to district	99%	87%	87%	89%	96%	87%	87%	88%	87%	91%	89%	91%
Use of Surveillance Data	Routine analysis of data (% expected criteria met for all facilities in district)	63%	61%	0%	30%	14%	78%	52%	6%	50%	12%	25%	25%
Management of IDSR System	Feedback to facilities from district (% expected criteria met for all facilities in district)	3%	43%	46%	23%	18%	39%	50%	31%	8%	20%	38%	16%
	Availability of tools / job aids for IDSR (% expected tools available in each district)	50%	35%	56%	53%	46%	48%	46%	41%	57%	48%	60%	39%
	Feedback to communities on IDSR (% all facilities providing feedback)	25%	64%	71%	80%	57%	100%	100%	42%	83%	82%	38%	75%

Annex D. Facility Report Accuracy Results by Facility and District

District	Facility	Accuracy - cases (%)	Accuracy - deaths (%)	Overall report accuracy (%)
BABATI	BABATI HOSPITAL	100	94	97
	MAGUGU HC	100	94	97
	BONGA DISP	100	100	100
	DAREDA KATI DISP	100	100	100
	GALAPO DISP	100	100	100
	MAMIRE DISP	100	100	100
	MWADA DISP	100	100	100
	Pooled mean	**100**	**98**	**99**
	Maximum	*100*	*100*	*100*
	Minimum	*100*	*94*	*97*
	Difference	*0*	*6*	*3*
DODOMA RURAL	HANDALI RHC	65	94	79
	NKOME DISP	65	100	82
	MANZASE DISP	76	88	82
	MVUMI HOSP (INP)	82	82	82
	BAHI DISP	71	100	85
	KIGWE DISP	71	100	85
	MVUMI HOSP (OUT)	71	100	85
	HANETI RHC (INP)	76	94	85
	ISANGHA DISP	76	100	88
	MLOWA BARABARANI	82	100	91
	MNKOLA DISP	82	100	91
	HANDALI R.H.C	88	100	94
	HUNEKWA DISP	88	100	94
	HANETI RHC (OUT)	94	94	94
	Pooled mean	**78**	**97**	**87**
	Maximum	*94*	*100*	*94*
	Minimum	*65*	*82*	*79*
	Difference	*29*	*18*	*15*
IGUNGA	IGUNGA HOSPITAL	53	88	71
	CHOMA HC	59	100	79
	ZIBA DISP	71	100	85
	USSONGO HC	76	100	88
	ITUMBA	82	100	91

	YAMBARARE DISP	82	100	91
	WAZAZI DISP	100	100	100
	Pooled mean	**75**	**98**	**87**
	Maximum	*100*	*100*	*100*
	Minimum	*53*	*88*	*71*
	Difference	*47*	*12*	*29*
MASASI	CHIWALE HC	65	94	79
	NANGANGA	65	100	82
	MARATANI DISP	71	100	85
	NAGAGA HC	71	100	85
	MKOMAINDO HOSP	88	88	88
	LUKULED DISP	76	100	88
	MEMO DISP	76	100	88
	LIKOKONA DISP	94	100	97
	MUMBAKA DISP	94	100	97
	NANYINDWA DISP	100	100	100
	Pooled mean	**80**	**98**	**89**
	Maximum	*100*	*100*	*100*
	Minimum	*65*	*88*	*79*
	Difference	*35*	*12*	*21*
MBULU	MBULU HOSPITAL	76	88	82
	MURRAY DISP	88	100	94
	DAUDI DISP	94	100	97
	DONGOBESH HC	100	100	100
	ENDANAGICHAN HC	100	100	100
	LABAY DISP	100	100	100
	YAEDA CHINI	100	100	100
	Pooled mean	**94**	**98**	**96**
	Maximum	*100*	*100*	*100*
	Minimum	*76*	*88*	*82*
	Difference	*24*	*12*	*18*
MPWAPWA	KIBAKWE HC	71	94	82
	PWAGA DISP	65	100	82
	RUDI HC	65	100	82
	IPERA DISP	71	100	85
	WIYENZELE DISP	82	100	91
	CHOGOLA DISP	88	100	94
	CHUNYU DISP	88	100	94
	Pooled mean	**76**	**99**	**87**
	Maximum	*88*	*100*	*94*
	Minimum	*65*	*94*	*82*
	Difference	*24*	*6*	*12*
MULEBA	RUBYA	71	82	76
	KAIGARA HC	65	100	82
	KAGOMA	71	100	85
	OMURUNAZI	88	100	94
	KOLPING-KARAMBI	100	94	97

	Pooled mean	**79**	**95**	**87**
	Maximum	*100*	*100*	*97*
	Minimum	*65*	*82*	*76*
	Difference	*35*	*18*	*21*
MWANZA	KARUME HC	59	94	76
	CORNER DISP	71	100	85
	SANGABUYE	76	100	88
	KAHAMA DISP	88	100	94
	KIRUMBA DISP	88	100	94
	Pooled mean	**76**	**99**	**88**
	Maximum	*88*	*100*	*94*
	Minimum	*59*	*94*	*76*
	Difference	*29*	*6*	*18*
NKASI	KILANGALA HC	59	82	71
	NAMANYERE DDH	65	100	82
	KATANI DISP	71	100	85
	KIRANDO HC	88	88	88
	CHALA	76	100	88
	KILANGALA(OUT)	82	100	91
	MANDAKERENGE	94	88	91
	NTUCHI	100	100	100
	Pooled mean	**79**	**95**	**87**
	Maximum	*100*	*100*	*100*
	Minimum	*59*	*82*	*71*
	Difference	*41*	*18*	*29*
SUMBAWANGA	LAELA	53	100	76
RURAL	MPUI HC	59	100	79
	MTOWISA	71	100	85
	KAENGESA HC	88	88	88
	MITITI	76	100	88
	KISUMBA KASOTE	82	100	91
	KASANGA	88	100	94
	MBUZA	94	100	97
	MNOKOLA	100	100	100
	MSANZI	100	100	100
	MUZE	100	100	100
	Pooled mean	**83**	**99**	**91**
	Maximum	*100*	*100*	*100*
	Minimum	*53*	*88*	*76*
	Difference	*47*	*12*	*24*
TABORA URBAN	KITETE HOSPITAL	71	82	76
	BAKWATA HC	76	100	88
	KALUNDE DISP	76	100	88
	IPULI DISP	82	100	91
	ISEVYA DISP	82	100	91
	NG'AMBO DISP	82	100	91
	ARDHI DISP	88	100	94

	NDEVELWA DISP	88	100	94
	Pooled mean	**81**	**98**	**89**
	Maximum	*88*	*100*	*94*
	Minimum	*71*	*82*	*76*
	Difference	*18*	*18*	*18*
TUNDURU	TUNDURU HOSP	65	76	71
	NANDEMBO	71	100	85
	LIGUNGA	76	100	88
	NAKAPANYA	82	94	88
	LIGOMA DISP	94	100	97
	AZIMIO DISP	100	100	100
	MKASALE RHC	100	100	100
	TUNDURU BAKWATA	100	100	100
	Pooled mean	**86**	**96**	**91**
	Maximum	*100*	*100*	*100*
	Minimum	*65*	*76*	*71*
	Difference	*35*	*24*	*29*

Annex E. District Report Accuracy Results

District	Accuracy - cases (%)	Accuracy - deaths (%)	Overall report accuracy (%)
BABATI	94	100	97
DODOMA RURAL	53	82	68
IGUNGA	41	88	65
MASASI	65	88	76
MBULU	94	100	97
MPWAPWA	47	94	71
MULEBA	41	76	59
MWANZA	47	94	71
NKASI	65	100	82
SUMBAWANGA RURAL	53	88	71
TABORA URBAN	47	82	65
TUNDURU	76	94	85
Average	**60**	**91**	**75**
Maximum	*94*	*100*	*97*
Minimum	*41*	*76*	*59*
Difference	*53*	*24*	*38*

Annex F. Attitude and Motivation Results by District and Health Worker Type

Results by District

Table 1: Job Satisfaction for the following items by district (represents satisfied and very satisfied responses)

		BBT	DDM	IGN	MSS	MBL	MPP	MLB	MZA	NKS	SWN	TBR	TNR	Total[5]
	N	**13**	**16**	**9**	**22**	**16**	**14**	**9**	**17**	**12**	**18**	**22**	**15**	**183**
Co-workers	**n**	12	14	9	22	15	13	9	13	11	17	19	14	168
	%	92	88	100	100	100	93	100	76	92	94	86	93	92
Supervisor's support	**n**	9	16	7	15	15	14	8	13	10	18	17	14	156
	%	69	100	78	68	100	100	89	76	83	100	77	93	86
Responsibilities	**n**	11	14	7	20	15	14	9	13	11	18	17	13	162
	%	85	88	78	91	100	100	100	76	92	100	77	93	90
Management of IDSR	**n**	11	13	6	16	13	12	5	10	9	17	15	12	139
	%	85	81	67	73	87	86	56	59	75	94	68	80	76
Opportunity to use abilities	**n**	12	13	7	18	13	14	7	11	9	17	13	12	146
	%	92	81	78	82	87	100	78	65	75	94	59	80	80
Chance to accomplish	**n**	10	10	7	18	13	14	5	13	7	17	16	12	142
	%	77	63	78	82	81	100	56	76	58	94	73	86	78
Education and training	**n**	7	8	3	9	12	10	4	8	4	12	7	9	93
	%	54	50	38	41	75	71	44	47	33	67	32	60	51
Adequate authority	**n**	12	12	7	16	12	13	5	15	9	14	16	14	145
	%	92	75	88	73	75	93	56	88	75	78	73	93	80
AVERAGE	**%**	81	78	76	76	88	93	72	70	73	90	68	85	79

Table 2. Difficulties or obstacles encountered in monitoring and reporting on infectious diseases, and in responding to disease cases – by district (represents agree and strongly agree responses)

		BBT	DDM	IGN	MSS	MBL	MPP	MLB	MZA	NKS	SWN	TBR	TNR	Total
	N	**13**	**16**	**9**	**22**	**16**	**14**	**9**	**17**	**12**	**18**	**22**	**15**	**183**
Limited	**n**	7	10	5	15	10	7	8	11	7	11	11	11	113

[5] Note that for all tables in this section, total percentages are calculated using the number of responses for each question as the denominator. Thus the overall denominator is not always equal to the Grand Total of N=183 respondents.

resources	%	54	63	56	68	63	50	89	65	58	61	50	73	62
Limited time	n	5	4	4	9	6	3	4	10	3	5	11	3	67
	%	38	25	44	41	38	21	44	59	25	28	50	20	37
Not assigned	n	4	1	0	3	3	2	0	2	0	2	7	5	29
	%	31	6	0	16	19	14	0	12	0	11	32	33	16
Not sure when to do	n	3	0	2	5	4	2	0	5	1	1	6	1	30
	%	23	0	22	24	27	14	0	29	8	6	27	7	17
Did not have skills	n	2	1	1	8	2	0	1	3	3	5	7	2	35
	%	15	6	11	40	13	0	11	18	25	28	32	13	19
AVERAGE	%	32	20	27	38	32	20	29	37	23	27	38	29	30

Table 3: What was most helpful in performing monitoring and reporting tasks - by district
(represents agree and strongly agree responses)

		BBT	**DDM**	**IGN**	**MSS**	**MBL**	**MPP**	**MLB**	**MZA**	**NKS**	**SWN**	**TBR**	**TNR**	**Total**
	N	**13**	**16**	**9**	**22**	**16**	**14**	**9**	**17**	**12**	**18**	**22**	**15**	**183**
Understood what to do	n	13	15	8	17	13	13	8	13	9	15	14	12	150
	%	100	94	100	81	87	93	89	76	75	83	64	80	83
Had knowledge & skills	n	11	15	9	16	14	14	7	14	9	15	11	12	147
	%	85	94	100	76	93	100	78	82	75	83	50	80	81
Enough resources	n	7	6	4	7	5	7	3	8	4	8	10	7	76
	%	54	38	44	33	33	50	33	47	33	44	45	47	42
Knew whom to ask	n	11	14	8	17	13	14	7	16	10	16	18	14	158
	%	85	88	89	81	87	100	78	94	83	89	82	93	87
Tried best & figured out	n	12	12	6	18	11	11	7	9	12	13	18	13	142
	%	92	75	67	86	73	79	78	53	100	72	82	87	78
AVERAGE	%	83	78	80	71	75	84	71	70	73	74	65	77	74

Table 4: General opinion and feedback - by district
(represents agree and strongly agree responses)

		BBT	**DDM**	**IGN**	**MSS**	**MBL**	**MPP**	**MLB**	**MZA**	**NKS**	**SWN**	**TBR**	**TNR**	**Total**
	N	**13**	**16**	**9**	**22**	**16**	**14**	**9**	**17**	**12**	**18**	**22**	**15**	**183**
Monitoring not essential (neg)	n	4	0	0	2	2	1	0	0	0	0	4	1	14
	%	31	0	0	9	13	7	0	0	0	0	18	7	8
People not data (neg)	n	2	0	1	1	4	1	0	0	1	1	4	1	16
	%	15	0	11	5	27	7	0	0	8	6	18	7	8
Collecting data saves lives (pos)	n	13	15	9	20	14	13	9	16	11	17	18	14	169
	%	100	94	100	91	93	93	100	94	92	94	82	93	93
Someone else should collect data (neg)	n	5	5	5	7	6	5	4	4	3	5	10	4	63
	%	38	31	56	32	40	36	44	24	25	28	45	27	35

Enjoy the skills I use (pos)	**n**	12	16	8	17	13	14	8	16	11	15	15	12	157
	%	92	100	89	81	87	100	89	94	92	83	68	80	87
Tracking disease data important (pos)	**n**	13	16	9	18	15	14	9	17	12	18	22	15	178
	%	100	100	100	86	100	100	100	100	100	100	100	100	98
Greater effort for IDSR (pos)	**n**	13	16	9	22	15	14	9	17	12	18	21	15	181
	%	100	100	100	100	100	100	100	100	100	100	95	100	99
AVG POSITIVE	%	98	99	97	93	95	98	97	97	96	94	86	93	94
AVG NEGATIVE	%	28	10	22	15	27	17	15	8	11	11	27	14	17

Results by Health Worker Type

Table 5: Job Satisfaction for the following items by HW type (represents satisfied & very satisfied responses)

		Clinician	Nurses	Attendant	Lab staff	Health Of	Other	Total
	N	76	51	30	8	11	7	183
Co-workers	**n**	68	46	30	8	11	5	168
	%	89	92	100	100	100	71	92
Supervisor's support	**n**	64	42	27	8	11	4	156
	%	84	84	90	100	100	57	86
Responsibilities	**n**	72	44	28	5	9	4	162
	%	95	88	93	63	82	67	90
Management of IDSR	**n**	58	37	23	6	10	5	139
	%	76	74	77	75	91	71	76
Opportunity to use abilities	**n**	65	36	24	6	11	4	146
	%	86	72	80	75	100	57	80
Chance to accomplish	**n**	62	37	25	8	7	3	142
	%	82	73	83	100	64	50	78
Education and training	**n**	51	17	14	3	6	2	93
	%	67	34	47	38	55	29	51
Adequate authority	**n**	62	36	27	6	9	5	145
	%	82	72	90	75	82	71	80
AVERAGE	**%**	83	74	83	78	84	59	79

Table 6: Difficulties or obstacles encounter in monitoring and reporting on infectious diseases, and in responding to disease cases by HW type. (represents agree and strongly agree responses)

		Clinician	Nurses	Attendant	Lab staff	Health Of	Other	Total
	N	76	51	30	8	11	7	183
Limited resources	**n**	44	35	18	4	8	4	113
	%	58	69	60	50	73	57	62
Limited time	**n**	24	25	9	3	1	5	67
	%	32	49	30	38	9	71	37
Not assigned	**n**	6	9	4	5	2	3	29
	%	8	18	13	63	18	43	16
No sure when to do	**n**	7	13	5	3	0	2	30
	%	9	27	17	38	0	29	17
Did not have skills	**n**	10	13	9	1	1	1	35
	%	13	27	30	13	9	14	19
AVERAGE	**%**	24	38	30	40	22	43	30

Table 7: What was most helpful in performing monitoring and reporting tasks - by HW type (represents agree and strongly agree responses)

		Clinician	Nurses	Attendant	Lab staff	Health Of	Other	Total
	N	76	51	30	8	11	7	183
Understood what	**n**	68	35	24	8	10	5	150
	%	91	70	83	100	91	71	83
Had knowledge & skills	**n**	68	35	24	7	9	4	147
	%	91	70	80	88	82	57	81
Enough resources	**n**	34	15	14	5	4	4	76
	%	45	30	47	63	36	57	42
Knew whom to ask	**n**	72	37	26	8	10	5	158
	%	96	74	87	100	91	71	87
Tried best & figured out	**n**	57	38	24	8	11	4	142
	%	76	76	80	100	100	57	78
AVERAGE	**%**	80	64	75	90	80	63	74

Table 8: General opinion and feedback - by HW type

(represents agree and strongly agree responses)

		Clinician	Nurses	Attendant	Lab staff	Health Of	Other	Total
	N	76	51	30	8	11	7	183
Monitoring not essential (neg)	**n**	2	3	4	2	1	2	14
	%	3	6	13	25	9	29	8
People not data (neg)	**n**	3	4	5	3	1	0	16
	%	4	8	17	38	9	0	9
Collecting data saves lives (pos)	**n**	71	47	28	8	10	5	169
	%	93	94	93	100	91	71	93
Someone else should collect data (neg)	**n**	24	17	12	5	3	2	63
	%	32	34	40	63	27	29	35
Enjoy the skills I use (pos)	**n**	67	42	25	6	10	7	157
	%	89	84	83	75	91	100	87
Tracking disease data important (pos)	**n**	75	48	29	8	11	7	178
	%	100	96	97	100	100	100	98
Greater effort for IDSR (pos)	**n**	76	50	29	8	11	7	181
	%	100	100	97	100	100	100	99
AVG POSITIVE	**%**	96	94	93	94	96	93	94
AVG NEGATIVE	**%**	13	16	23	42	15	19	17