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Baseline Monitoring and Evaluation of Integrated Disease Surveillance and Response in Tanzania

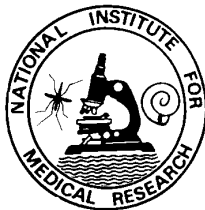
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Partners for Health Reformplus is USAID's flagship project for health policy and health system strengthening in developing and transitional countries. The five-year project (2000-2005) builds on the predecessor Partnerships for Health Reform Project, continuing PHR's focus on health policy, financing, and organization, with new emphasis on community participation, infectious disease surveillance, and information systems that support the management and delivery of appropriate health services. PHRplus will focus on the following results:

- ▲ *Implementation of appropriate health system reform.*
- ▲ *Generation of new financing for health care, as well as more effective use of existing funds.*
- ▲ *Design and implementation of health information systems for disease surveillance.*
- ▲ *Delivery of quality services by health workers.*
- ▲ *Availability and appropriate use of health commodities.*

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Abstract

Integrated Disease Surveillance and Response (IDSR), a strategy developed by the World Health Organization Regional Office for Africa in 1998, has been adopted by the Tanzanian Ministry of Health. 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, and 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.

In order to improve the effectiveness of strategy implementation, monitoring and evaluating the performance of the surveillance system is important. Data are collected, analyzed, and interpreted on a weekly, monthly, or quarterly basis by facility and district staff and used to identify areas that require strengthening. Several indicators are used to measure progress towards achieving an overall program target. These focus on reporting, data quality, quality of investigation and response, and system functioning.

This report presents the findings of baseline data collection for the period October–December 2003 in 12 districts representing eight regions of Tanzania. In addition to the formal analysis, a number of observations from the field work are discussed. In general, reporting systems are weak, both in terms of receiving all reports from all facilities in a timely manner, and in managing those reports at the district level. Routine analysis of surveillance data is not being done consistently at facility and district levels, and district monitoring of the surveillance system performance is poor. On a positive note, however, it was found that districts performed quite well in managing suspected outbreaks that occurred during this period. There is also good communication and coordination with other sectors in terms of sharing information and resources. Preliminary results, provided to districts during training, are already producing improvements in system functioning.

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Acronyms

AFP	Acute Flaccid Paralysis
CCHP	Comprehensive Council Health Plan
CDC	Centers for Disease Control and Prevention
CFR	Case Fatality Rate
CHMT	Council (District) Health Management Team
CIF	Case Investigation Form
EPI	Expanded Program on Immunizations
IDS	Infectious Disease Surveillance
IDSR	Integrated Disease Surveillance and Response
ITN	Insecticide-Treated Net
NIMR	National Institute for Medical Research
NNT	Neonatal Tetanus
M&E	Monitoring and Evaluation
MOH	Ministry of Health
MTUHA	<i>Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya</i> (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, of public health importance, and those 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 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) have been working together since 2002 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 with the purpose of providing information against which the effects of project interventions on IDSR performance could be monitored and evaluated. 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. Three main mechanisms were used to collect the required data: record reviews, group interviews and an individual survey of attitudes and motivation.

This baseline monitoring and evaluation exercise revealed a number of areas in which the integrated disease surveillance and response system was performing well, and identified others that required strengthening. Positive performance was noted in the following areas:

- ▲ **Outbreak Management:** This is the component of IDSR that is most familiar to people and districts performed well in it. Of the three steps (outbreak investigation, laboratory confirmation, and outbreak response), performance was strongest on outbreak investigations, although timely notification to the district was weak.
- ▲ **Planning and monitoring based on data:** Almost all of the districts indicated that they had used data to plan and monitor their activities, with the majority of examples cited being related to epidemiological data. It is unclear whether this was done as formally as is desired (given that indicators on routine data analysis and surveillance monitoring showed poor results), but the fact that districts perceive themselves to be making decisions based on data is a good start.
- ▲ **Linkages within and outside the health sector:** District health teams realize that prevention and control of infectious diseases are not their responsibility alone. Sharing data, coordinating resources, and working with other sectors and the community to implement prevention activities are common practices.
- ▲ **Attitudes and motivation:** Health workers showed overall positive attitudes towards and motivation to perform their IDSR tasks. As expected, they expressed a desire for more resources and more education and training opportunities. Recognition by health workers that collecting and reporting surveillance data serves an important public health purpose is encouraging.

Areas that require strengthening include:

- ▲ **Reporting:** Weekly reporting from facilities to districts is weak, with some districts not using this system at all. Monthly reporting performance is better, perhaps due to the overlap with periods of salary collection at the district headquarters and a longer reporting period. Low levels of timeliness, completeness and accuracy result in districts and regions having an incomplete picture of the disease situation.

Data management, and particularly file organization, requires strengthening at both facility and district levels. Related to this is the mechanism for submitting reports, particularly the issue of reports submitted by radio call not being individually documented. Lack of standardization of reporting forms makes it difficult to compile data. In addition, multiple and diverse reporting requirements pose a problem for health workers.

- ▲ **Routine data analysis:** Data analysis at both district and facility levels is weak. While many facilities and districts kept track of the total number of disease cases seen, very few analyzed the data at a level of detail necessary for decision-making.
- ▲ **Feedback:** Very little feedback was being provided through all levels of the health system. Supervision visits carried out by districts on a fairly regular basis are an ideal mechanism for sharing more information about the performance of the surveillance system and for problem solving. The interest and enthusiasm exhibited by facility and district personnel during feedback sessions with the data collectors are an indication of the need for improved feedback mechanisms.

It will be important for districts to continue monitoring their own performance. During IDSR training planned for all of the project districts, Council Health Management Team members will be introduced to key indicators and tools that they can use to collect and analyze data on how the IDSR system is functioning. Further support will be provided to organize district quarterly meetings to review the status of IDSR, with particular attention given to reviewing indicators and planning interventions to address problem areas. These results can also be used at the national level to provide a snapshot of IDSR performance in the country and to provide insights on how the system can be strengthened.

1. Introduction

1.1 Background of IDSR in Tanzania

Integrated Disease Surveillance and Response (IDSR) is a strategy 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 Response¹ (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.

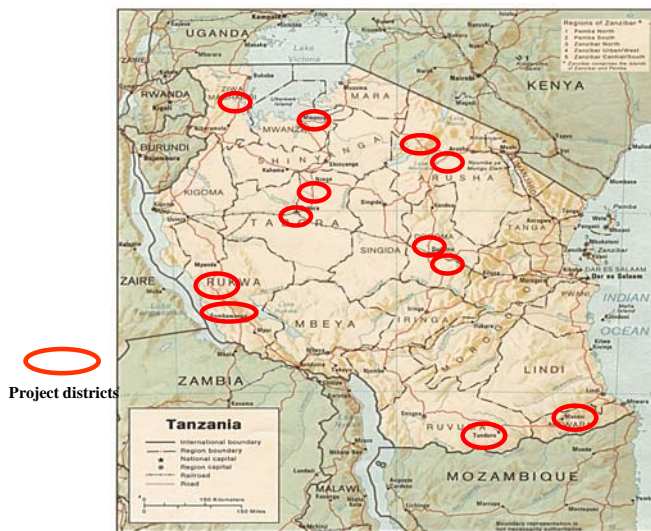
Table 1: List of Priority Diseases in Tanzania

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

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) is supporting 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 is a three-year activity (2002-2005) focusing on 12 districts² around the country. USAID also provides technical support for infectious disease surveillance and response activities through the CHANGE Project to address behavior change issues, and through the U.S. Centers for Disease Control and Prevention (CDC) 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 will build 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 are designed to facilitate the implementation of the IDSR strategy to strengthen surveillance and response in the other districts of Tanzania, and will also provide useful experiences to share with other countries. Project implementation will focus on mechanisms for improving data quality and increasing their availability, improving evidence-based decision making and response, and reinforcing an organizational culture that values information 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 is an important component to ensure that the project is accomplishing its goals. This report focuses on baseline monitoring and evaluation activities carried out before any of the districts had received training in IDSR. Some of the indicators discussed are 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 Ministry of Health 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 baseline performance of IDSR systems in each of the districts in which NIMR/PHR*plus* is intervening, against which progress will be measured. The most recently completed quarter, October to December 2003, was used as the reference period.

This data collection was termed “baseline” because it was the first time that data was collected in a comprehensive and technically rigorous manner in all 12 project districts. The project previously gathered self-reported information as part of its situation analysis (2002) and as part of epidemic preparedness planning workshops (2003). However, as districts had not yet received any training or support for calculating indicators, this manner of data collection was not deemed consistently reliable. Comparison with results from the current round of data collection show significant differences between the self-reported information and the data collected using specialized instruments and trained data collectors. The indicators calculated by the districts themselves generally showed better performance than those calculated by the project.

2. Monitoring and Evaluation of IDSR: Indicators of Performance

In order to improve the effectiveness of strategy implementation, monitoring and evaluating the performance of the surveillance system is important. 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 the functioning of the surveillance system and thereby identify areas that require strengthening and take action. The performance areas that are targeted for monitoring fall into four general categories: reporting, use of surveillance data, outbreak management, and management of the IDSR system. A total of 34 indicators were developed that cover these categories at the regional (sub-national), 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 below 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 part 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. 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 next section (Results).

Districts are expected to monitor on their own 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 will be oriented to these indicators and provided with tools to assist in their collection and monitoring during IDSR training to be conducted by the project.

Table 2: Summary of IDSR Indicators

	Region	District	Facility
Reporting	<ul style="list-style-type: none"> ▲ Accuracy of district reports to region ▲ <i>Timeliness of <u>weekly</u> and <u>monthly</u> district reporting to the region</i> ▲ <i>Completeness of <u>weekly</u> and <u>monthly</u> district reporting to the region</i> 	<ul style="list-style-type: none"> ▲ <i>Timeliness of <u>weekly</u> and <u>monthly</u> health facility reporting to the district</i> ▲ <i>Completeness of <u>weekly</u> and <u>monthly</u> health facility reporting to the district</i> ▲ Reporting of priority diseases using case-investigation forms 	<ul style="list-style-type: none"> ▲ Accuracy of facility reports to district
Use of Surveillance Data	<ul style="list-style-type: none"> ▲ Surveillance monitoring 	<ul style="list-style-type: none"> ▲ <i>Routine analysis of data</i> ▲ Surveillance monitoring ▲ Planning and monitoring based on data 	<ul style="list-style-type: none"> ▲ <i>Routine analysis of data</i>

Outbreak Management	<ul style="list-style-type: none"> ▲ Investigation of and response to outbreaks 	<ul style="list-style-type: none"> ▲ <i>Appropriate investigation of suspected outbreaks</i> ▲ <i>Effective laboratory confirmation process</i> ▲ <i>Appropriate response to confirmed outbreaks</i> ▲ Outbreak preparedness ▲ Evaluation of outbreak management ▲ <i>Quality of case management (case fatality rate)</i> 	
Management of IDSR System	<ul style="list-style-type: none"> ▲ Feedback to regions from MOH 	<ul style="list-style-type: none"> ▲ Feedback to districts from region ▲ Communication and coordination within and outside the health sector ▲ IDSR activity planning ▲ Implementation of IDSR activities ▲ Knowledge of community leaders and district officials on IDSR* 	<ul style="list-style-type: none"> ▲ 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

*The indicator on community knowledge was not measured during the baseline

**The indicator on health worker knowledge and skills is initially measured during training pre- and post-tests, not field data collection

3. Methodology

3.1 Sampling and Site Selection

The purpose of the monitoring and evaluation was to assess the effects of project interventions on IDSR performance. The M&E activity does not officially include control districts, but comparisons can (and will) be made with non-project districts using the WHO/AFRO indicators that the Tanzanian MOH is collecting nationwide. These baseline data were collected in all eight regions and 12 districts in which the project intervenes (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 this 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. 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. (A list of health facilities visited in each district is in Annex B.)

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 October to December 2003, report tracking tools, case investigation forms, 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.

Facility: Patient registers, copies of weekly and monthly reports for October to December 2003, results of data analysis, schedules and reports for community outreach activities, case investigation forms, and standard case definitions.

Region: Weekly and monthly reports submitted by all districts in the region for the period October to December 2003, 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 attempting 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 or DHMTs), including 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 larger 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 specimens were received, quality of specimens and test results.

▲ *Self-administered survey*

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 Swahili so that it could be self-administered.

The instruments were pre-tested in Bagamoyo, a non-project district. All of the district and facility level instruments were tested with the district health team, the district hospital staff, and staff from two dispensaries in the area. Following the pre-test the data collectors provided feedback and the instruments were revised accordingly.

3.3 Data Collection

The data collection team was composed of two statisticians from the NIMR IDSR team who served as supervisors, and eight 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. The group was organized into two teams, each covering six districts. A *PHRplus* team member was present for the first few weeks of data collection to help modify the instruments and to provide technical support as issues arose in the field.

Following the pre-test, the data collection was carried out in two phases:

- ▲ Phase 1: four districts scheduled to participate in the first round of district training (Mpwapwa, Dodoma Rural, Babati, Mbulu); January 28–February 14, 2004
- ▲ Phase 2: eight districts (Muleba, Mwanza City, Tabora Urban, Igunga, Masasi, Tunduru, Sumbawanga Rural, Nkasi); February 18–March 20, 2004

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 was entered into Microsoft Excel spreadsheets. Two NIMR data entry clerks entered the data following each of the collection phases, with double data entry done for the accuracy instruments, as check files were not possible for these. The data were then transferred to Excel and Stata (v.7, StataCorp, College Station, TX, USA) to make one master file containing all information from all forms. Frequency distributions were calculated for all variables and the results were reviewed for the purposes of detecting discrepancies (out of range values). 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 (October, November and December) was selected 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. November was the target month for this review, but if the facility had not submitted a report for November 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:** 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 case investigation forms:** 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 data collection activities, organized according to the four general categories and indicators explained in Section 2. 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 (CIF).

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. Reports received after the deadlines and those for which timeliness could not be assessed were grouped together as "late" for the purpose of these calculations. 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.

Dodoma Rural and Masasi districts were not using the weekly surveillance reports during this period and are thus not included in weekly calculations. Neither district gave a specific reason for this.

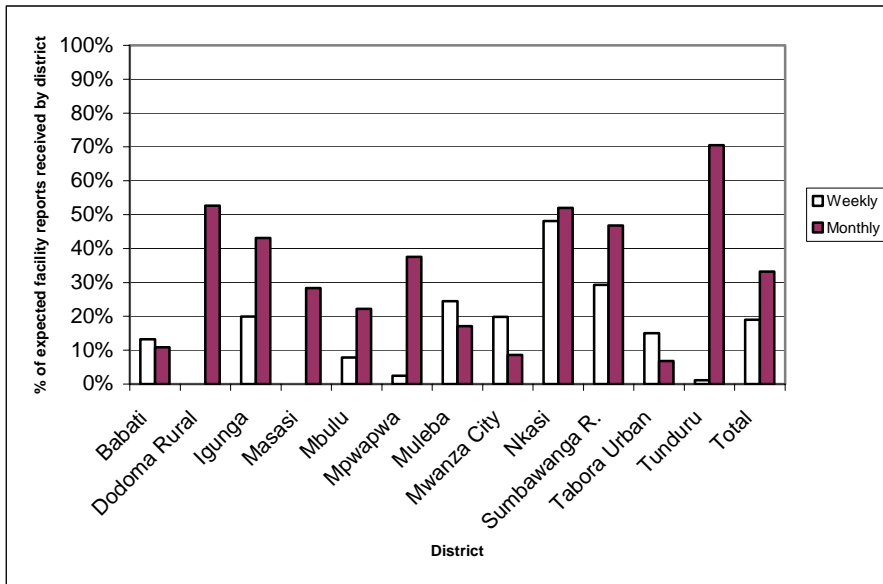
Different deadlines were found in the districts for monthly and weekly reports. The weekly reporting period was not standard across most of the districts, although this was less of a problem for monthly reports. Even within the same district the facilities were found to have different days of starting and ending the report week (for example, from Tuesday to Monday or Friday to Thursday). Local deadlines for each district were used to assess the timeliness of the reports from health facilities. For the October–December period under review, three monthly reports and 13 weekly reports were expected.

4.1.1.1 Completeness

As Figure 2 shows, total reporting completeness for all districts was 33 percent (range: 7-71 percent) for monthly reports and 19 percent (range: 1-48 percent) for weekly reports. In almost all districts, completeness was higher for monthly reports than for weekly reports. None of the districts met the target of receiving 80 percent of expected reports for the quarter. Tunduru had the highest rate of monthly reporting, but one of the lowest weekly rates. Nkasi was the most consistent across reports, with approximately 50 percent of its facilities reporting on a weekly and monthly basis. When inquiring about

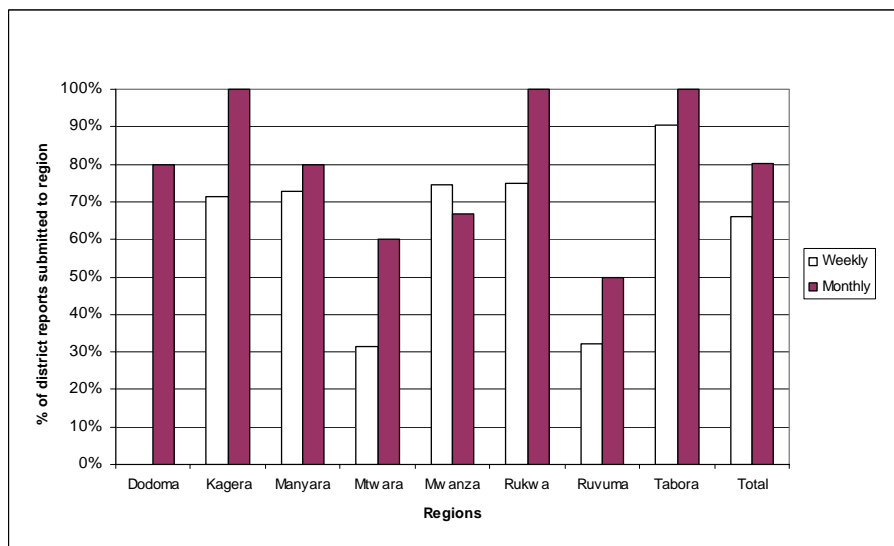
poor reporting performance in some facilities, it was found that the periods of poorest performance often correlated with those periods when the person responsible for reporting was away from the post. Reporting is particularly weak among hospitals. Less than half (48 percent) of the 21 hospitals in the districts had submitted any weekly or monthly reports during the quarter.

Figure 2: Completeness of Health Facility Reporting to District



Completeness for district reports to the region was much higher, 66 percent (range: 31-90 percent) for weekly reports and 80 percent (range: 50-100 percent) for monthly reports overall (see Figure 3). It should be noted that these results cover all districts within the regions, not only those participating in the IDSR project activities. Kagera, Rukwa, and Tabora regions all achieved 100 percent coverage of monthly reporting. Dodoma Region stated that all weekly reports are received from districts on time via radio call, but there were no copies of reports found for individual districts to verify this so the results are reported as 0 percent for both completeness and timeliness. Copies of monthly reports were found.

Figure 3: Completeness of District Reporting to Region



When results from project districts are pulled out from the regional data, we see that these districts fared slightly worse on weekly reporting, but better on weekly reporting.

Table 5: Performance of Project Districts on Reporting to Regions

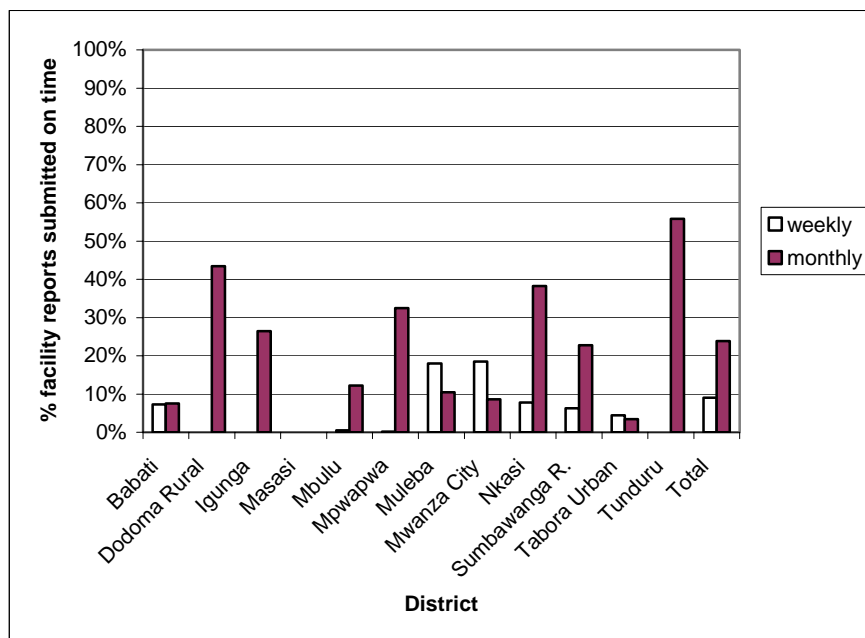
	Timeliness		Completeness	
	Weekly	Monthly	Weekly	Monthly
All districts	47%	60%	66%	80%
Project districts	41%	67%	62%	92%

4.1.1.2 Timeliness

Most of the districts were tracking timeliness, either directly on the reports or on a tracking form. No weekly data were available for Dodoma Rural and Masasi districts because they were not using weekly reports, while Tunduru was not tracking timeliness for weekly reports and Masasi was not tracking timeliness for monthly reports. Some recorded the actual dates that reports were received, while others only marked timely or late, which did not allow for independent verification.

As Figure 4 shows, overall timeliness of reporting was only 8 percent (range 0-19 percent) for weekly reports and 24 percent (range: 3-56 percent) for monthly reports. Tunduru had the highest rate of timeliness for monthly reports (56 percent), while Muleba and Mwanza City had the highest rates for weekly reports, at 18 percent and 19 percent, respectively. Igunga had 0 percent timeliness for weekly reports. None of the districts reached the target of 80 percent of reports received on time.

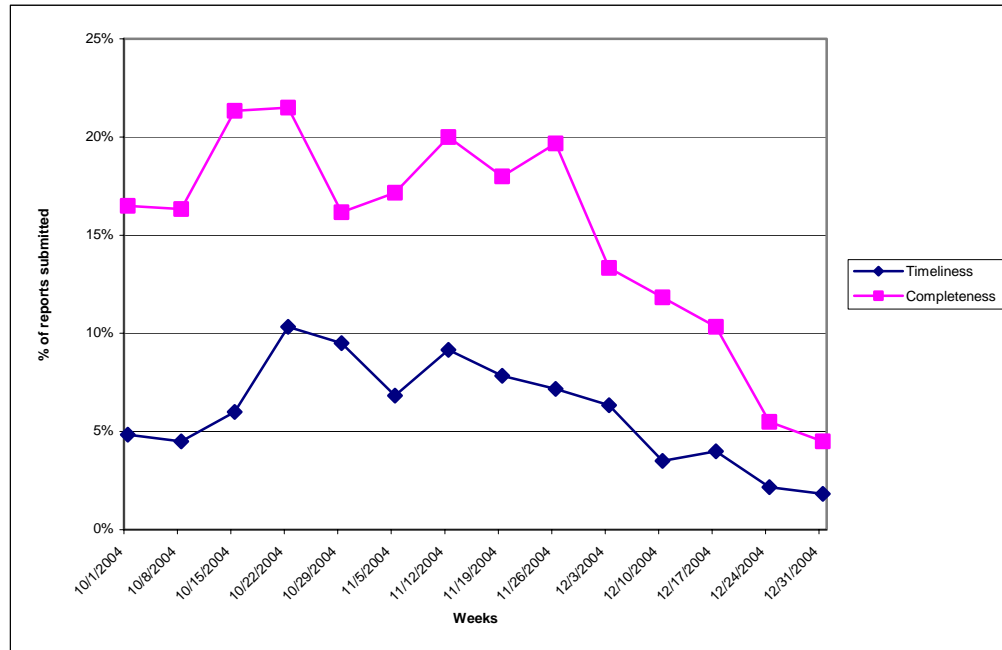
Figure 4: Timeliness of Health Facility Reporting to District



Note: Weekly data not available for Dodoma Rural, Masasi, and Tunduru; monthly data not available for Masasi.

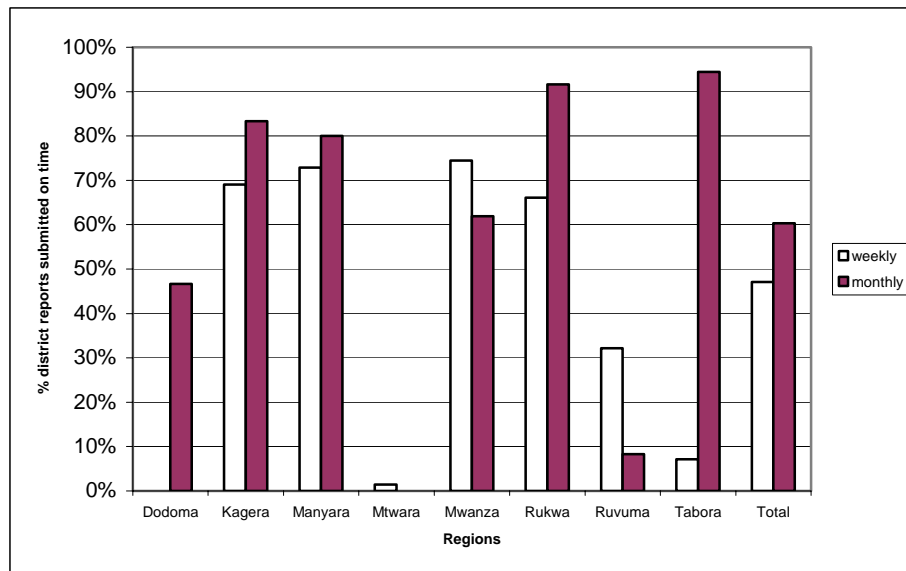
Examining the performance of all facilities combined over time, Figure 5 shows that coverage and timeliness followed similar patterns during the quarter. The highest point for each was reached during the week of October 22, with significant declines during the holiday period at the end of the quarter.

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. The deadlines for the district reports to the region were mentioned to be Thursday for weekly reports and the 15th of the coming month for the monthly reports. On average 47 percent (range: 1-74 percent) of expected weekly reports were on time, while the figure was 60 percent (range: 0-94 percent) for monthly reports. Half of the regions met or exceeded the target of 80 percent timeliness for monthly reports. Dodoma Region stated that all of its districts report on time via radio call, but there were no records to document this. Figure 6 shows that timeliness of weekly reporting lags behind in most regions, with the exception of Mwanza. The results for Mtwara region were so low due primarily to the fact that several reports from the districts were not available at the regional office; among the reports reviewed only one was found to be on time.

Figure 6: Timeliness of District Reporting to Region



4.1.1.3 Observations

In general, field visits for data collection revealed that data management and organization were weak at the district and health facility levels. Most districts had reports organized into weekly and monthly folders by year, but these were not always maintained (reports mixed between the two, other reports (non-IDSRS) mixed in). None were organized by facility, which could facilitate monitoring of reporting performance. In some cases it took most of the day for all of the required reports to be obtained because they were filed in many different places. Different formats were being used for weekly and monthly reports and many reports were hand-drawn on notebook paper. Some facilities used the old Essential Drug Programme and Infectious Disease Week Ending forms for reporting to the district level. Lack of standardized reporting formats resulted in inconsistency of reporting both within and among districts.

In several instances weekly and monthly reports were found at the health facilities but not at the district level, suggesting problems in the reporting chain. Several possible explanations exist: 1) the reports were not actually sent from the facility, 2) the reports were sent with local transport or by other means but never delivered to the district, 3) the reports were delivered to the district office but not to the right person (particularly possible when the district office and district hospital were co-located), and 4) the reports were delivered to the appropriate person at the district but then lost. There was also difficulty at both levels obtaining copies of reports for health facilities that use radio calls to transmit their reports to the district. In some cases reports were not found at the health facility, although they may have recorded the data in a notebook. At the district level, data received via radio call might not be copied onto a reporting form for that facility, but rather be added to the total tally for the district.

Many facility staff noted that they had a heavy reporting burden complicated by inconsistent requirements (MTUHA, IDSRS, other programs). For example, the MTUHA reports combine pneumonia, bronchitis, and other respiratory ailments under Acute Respiratory Infections, while the IDSRS report asks for pneumonia and severe pneumonia. Different reporting systems use different age categories and some require reporting by sex. The result is that facility staff must have a very good system for reviewing registers and tallying their data, or must do it multiple times to meet the different criteria of different programs.

4.1.2 Accuracy of Reports

Data quality 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 85 facility reports and registers were reviewed, with the majority (76 percent) from November, 16 percent from October and 8 percent from December. 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), recognizing that the data collectors could have also made mistakes when reviewing registers.

Nevertheless, Table 6 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 only 13 percent for diarrhea with some dehydration, 15 percent for pneumonia and 25 percent for malaria. Accuracy was lowest for the disease conditions with the highest numbers of cases: there were nearly 4,000 more cases of malaria and 500 cases of diarrhea (categories combined) reported by facilities than found in the register review. (Annex D presents the total numbers of cases and deaths in all facilities that were recorded for each disease condition by the data collectors and those taken from the submitted facility reports.) For all but two diseases (meningitis and severe pneumonia), the number of cases reported by the facilities exceeded the number tallied during the register review. However, this was not consistent across facilities, with some over-reporting and some under-reporting.

Measles was the only disease with reported cases for which the overall figures matched. However, when reviewing individual reports there were differences in categorizing by age groups (under five and over five), leading to 94 percent accuracy.

More than 95 percent of facilities accurately reported deaths for all conditions except malaria (88 percent) and severe pneumonia (93 percent). As only facilities with inpatient wards would be expected to report on deaths, the denominator for these calculations is much smaller (28). Analysis by facility indicates that it is only a few facilities that are making the most mistakes, particularly Mpwapwa District Hospital, Namanyere District Hospital (Nkasi), and Mbulu District Hospital.

Table 6: Summary of Monthly Report Accuracy Results – Facilities

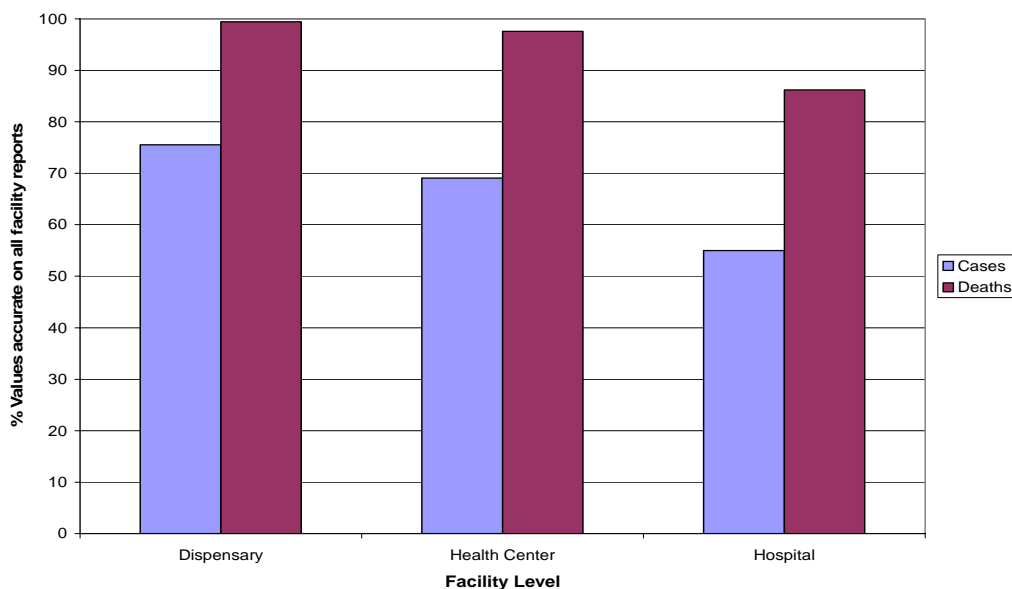
*Comparison of data reported by facilities on monthly reports
with data compiled independently from facility registers*

Disease Conditions	Proportion of reports for which:			
	Cases agreed	Deaths agreed	Cases under-reported	Cases over-reported
Diarrhea some dehydration	13%	100%	36%	51%
Pneumonia	15%	95%	38%	47%
Malaria	25%	88%	34%	41%
Bacillary dysentery	38%	98%	38%	25%
Severe pneumonia	52%	93%	34%	14%
Diarrhea severe dehydration	71%	96%	14%	15%
Typhoid	78%	99%	11%	12%
Animal/dog bites	79%	99%	14%	7%
Meningitis	92%	96%	7%	1%
Measles	94%	99%	4%	2%
Cholera	95%	99%	2%	2%
Acute flaccid paralysis	99%	100%	0%	1%
Rabies	99%	98%	0%	1%
Neonatal tetanus	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 and by health facility level. There was little variability among districts. The average rate of accuracy was 72 percent for all disease cases combined, ranging from a low of 68 percent in Dodoma Rural to a high of 77 percent in Tabora Urban (meaning that on average 72 percent of the case values on a report were +/-5 percent accurate). For deaths, the average was 98 percent; five districts had 100 percent accuracy for reporting of deaths. However, there was significant variability among facilities, with a difference of 56 percentage points between the best and poorest performing facilities for cases, and 44 percentage points for deaths. Two facilities, one each in Nkasi and Mwanza City districts, achieved 100 percent accuracy of case reporting. The facility with the lowest reporting accuracy (44 percent for cases and 56 percent for deaths) was also located in Nkasi district. (Tables with details for facilities and districts can be found in Annex E.)

Figure 7 shows that dispensaries had the best report accuracy and hospitals the poorest, suggesting that data quality decreases with an increased volume of patients. The six hospitals evaluated had an overall report accuracy for cases of only 55 percent (range: 44-63 percent). The average for death reporting was better at 86 percent, but with much greater variability (range: 56-100 percent).

Figure 7: Monthly Report Accuracy by Health Facility Level



Observations from the health facility register review process that contributed to accuracy results included the following:

- ▲ Standard case definitions were not always used for recording diagnoses in registers (ex: plasmodiasis recorded instead of malaria). In addition, a number of uncommon and/or unknown abbreviations were found in registers, leading to incorrect tallying and reporting of data.
- ▲ Problems were observed wherein patients appeared to be registered more than once. For example, a patient was registered in the outpatient book and also registered in the inpatient department. This can lead to inaccurate reports.
- ▲ There was no standard inpatient register available so each facility improvised a hand-drawn register using a blank record book. Although MTUHA Book 1 had guidance on what to include in the inpatient register, there was no standardization among facilities, or even from one page to the next. In addition, registers were often incomplete, with information such as date, age, sex, diagnosis, treatment, or outcome missing.
- ▲ Some health facilities in the districts were found not to be using the MTUHA system at all; a few did not know what the books look like and what is supposed to be done. Thus data were not recorded in a standard way and incorrect reports were submitted. This was mainly found in hospitals and private health facilities.

4.1.2.2 District Reports to Regions

The majority (nine) of district reports reviewed were from November, with four from October and two from December. Table 7 shows that accuracy of reporting at this level was in fact worse than at the facility level for all disease conditions (detailed district results can be found in Annex F). As with the facility data, the number of reports for which cases and deaths agreed was based on a 5 percent margin of error. Nevertheless, none of the districts reported accurately on cases of diarrhea with some dehydration,

and only one report was accurate for pneumonia. In terms of both numbers of cases reported and proportion of reports, districts in general were reporting fewer cases to the regions than those tallied during the record review. Some of these discrepancies may be due to the fact that facility reports had been received after the district had already submitted its report to the region; thus the tally of cases from reports found at the time of data collection was higher than the number reported to the region. This highlights the importance of having good coverage and timeliness of reporting in order to have an accurate picture of the disease situation. For example, there were nearly 6,000 cases of malaria (approximately 15 percent), 1,700 cases of all categories of diarrhea (approximately 25 percent), and 870 cases of all categories of pneumonia (approximately 14 percent) that were not reported to the regions. (Annex G presents the total numbers of cases and deaths compiled during the record review from all facility reports in 12 districts, as well as the totals taken from district monthly reports submitted to the region.)

Table 7: 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
Diarrhea some dehydration	0	9	9	3
Pneumonia	1	6	6	5
Malaria	2	5	8	2
Bacillary dysentery	2	12	7	3
Severe pneumonia	5	10	3	4
Diarrhea severe dehydration	5	10	3	4
Typhoid	7	12	2	3
Animal/dog bites	6	11	1	5
Meningitis	8	11	1	3
Measles	9	11	2	1
Cholera	9	11	2	1
Acute flaccid paralysis	11	12	1	0
Rabies	11	11	0	1
Neonatal tetanus	12	12	0	0
Plague	12	11	0	0
Yellow fever	12	12	0	0

For the opposite scenario, where the number of cases reported by the districts exceeded the number tallied by the data collectors, the explanation may lie in the fact that some facility reports could not be located at the time of the record review. However, figures from these reports may have been included in the district report from the region. This may particularly be the case for information received from facilities via radio call, which may only be added to a total figure for the district and not recorded on a separate report for the facility. This underscores the importance of good file/record management to allow for verification of data.

Analysis by district showed that the average accuracy of reporting for cases was 58 percent, ranging from 31 percent in Sumbawanga Rural to 88 percent in Muleba, and for deaths it was 86 percent (range:

75-100 percent). Three districts had 100 percent accuracy for death reporting. There did not seem to be any correlation between performance and the number of facilities in a district.

Finally, it was noted that, because health facilities were not always using the same deadlines for submitting reports, it was difficult for districts to compile meaningful reports to send to the regions. Due to this, information received was sometimes found to be included in a different reporting period, sometimes combined with data for the coming week or month.

4.1.3 Use of Case Investigation Forms

According to MOH National Guidelines for IDSR, case investigation forms must be completed for suspected cases of acute flaccid paralysis (AFP), neonatal tetanus (NNT), measles, meningitis, cholera, plague, and yellow fever. There were no reported cases of plague or yellow fever. Ten districts reported that they are responsible for completing these forms, while the other two cited this as the responsibility of health facility personnel. During the period evaluated, all but two districts (Igunga and Mbulu) had reported cases of at least one of these diseases. 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. For the districts that were not using weekly reports (Dodoma Rural and Masasi), the monthly reports served as the source for number of cases.

AFP and measles were the only diseases for which CIFs were submitted, for 15 percent and 19 percent of cases, respectively (Table 8). No forms were found for the reported NNT, meningitis or cholera cases. Babati had the strongest overall performance, with 38 percent of its suspected cases reported using CIFs (38 percent for measles and 0 percent for meningitis). Mwanza City and Tunduru each reported a single case of AFP and used the CIF for these.

In some districts, such as Babati, the Reproductive and Child Health (RCH) unit was keeping track of these cases and some completed forms were found there. These forms were not compiled and sent to a higher level within the surveillance system; rather, the cases recorded were summarized and sent to the specific program or unit at a higher level each month and quarter.

Table 8: Number of Case Investigation Forms Found at District

District	AFP			NNT			Measles			Meningitis			Cholera			Total		
	Cases	Forms	%	Cases	Forms	%	Cases	Forms	%	Cases	Forms	%	Cases	Forms	%	Cases	Forms	%
Babati							24	10	42%	2	0	0%				26	10	38%
Dodoma Rural	2	0	0%	6	0	0%	4	0	0%				127	0	0%	139	0	0%
Igunga	No cases reported															0	0	
Masasi				1	0	0%	15	0	0%	3	0	0%	1860	0	0%	1879	0	0%
Mbulu	No cases reported															0	0	
Mpwapwa	8	0	0%				1	0	0%	4	0	0%				13	0	0%
Muleba										13	0	0%	17	0	0%	30	0	0%
Mwanza City	1	1	100%							28	0	0%				29	1	3%
Nkasi	1	0	0%				1	0	0%	3	0	0%	72	0	0%	77	0	0%

S'wanga Rural							1	0	0%				4	0	0%	5	0	0%
Tabora Urban							10	1	10%	8	0	0%				18	1	6%
Tunduru	1	1	100%				2	0	0%	5	0	0%	10	0	0%	18	1	6%
TOTAL	13	2	15%	7	0	0%	58	11	19%	66	0	0%	2090	0	0%	2234	13	0.6%

4.2 Use of Surveillance Data

Collecting data through weekly and monthly surveillance reports and case investigation forms 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 review 1) how epidemiological data are analyzed, 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

Analysis of data at the district level was quite weak. Only five of the 12 districts reported doing any type of trend analysis for IDSR priority diseases on a monthly or quarterly basis. Only two districts (Mbulu and Nkasi) stated that they did some type of trend analysis for malaria. WHO/AFRO recommends two specific types of analysis – tracking of monthly malaria inpatient cases and deaths, and long-term trend analysis (i.e., year to year) of malaria, both for children aged less than five years – and that these analyzes include data from the previous three months.³ Only Nkasi district had both types of analysis, but they were not current. (In fact, Nkasi had trend analysis for all of the weekly reportable diseases.)

All but two of the districts (Sumbawanga Rural and Mwanza City) had lists of the top 10 diseases in their catchment areas. Mbulu district had displayed person analysis for all 13 priority diseases and three districts (Dodoma Rural, Masasi, and Mpwapwa) had maps with disease cases marked.

At the facility level, 33 percent of facilities reported doing any type of trend analysis for priority diseases, and 28 percent stated that they did trend analysis for malaria. However, only 4 percent had graphs of monthly malaria cases and deaths for children less than five years, representing one facility each in Dodoma Rural, Igunga, Muleba, and Sumbawanga Rural districts, and none had long-term trends. The graphs in three of the four facilities contained current data. While listing of top 10 diseases was the norm at the district level, it was much less common at the facility level – only 7 percent of facilities had this type of analysis, representing Dodoma Rural, Igunga, Masasi, and Mwanza City districts. One facility each in Igunga and Muleba districts had maps with disease cases marked.

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.

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 was quite weak at both levels. Examples of these indicators include: timeliness and coverage of reporting, case fatality rates, proportion of outbreaks notified to the district within 24 hours, proportion of outbreaks with laboratory confirmation, etc. Seven of the eight regions reported being familiar with the indicators, but only two could provide specific examples to support this (Dodoma and Ruvuma). At the district level, three (Mpwapwa, Dodoma Rural, and Muleba) reported knowing the indicators but only one (Dodoma Rural) provided examples.

Five regions reported that their regional health management team met in the previous quarter to review indicators that tell about the performance of the IDSR system, but only Mtwara and Ruvuma regions provided evidence to support this. Both of these regions also took actions based on their indicator review, including sending letters and guidelines to the districts on how to prepare reports, notifying districts of poor performance, suggesting ways to resolve communications problems, and assuring availability of reporting forms at all districts. None of the districts met to review their IDSR indicators.

4.2.3 Planning and Monitoring Based on Data

The primary purpose of having quality 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 except one (Muleba) stated that they had used data for planning purposes and provided several interesting examples:

- ▲ Introducing fare reimbursement for health workers to bring reports to the district in order to increase completeness and timeliness of reporting (Babati district)
- ▲ Using information about the number of animal bites to order drugs from the Medical Stores Department (Tunduru district)
- ▲ Using data on increased diarrhoea cases in two wards to develop a program for toilet construction (Masasi district)
- ▲ Following an increased number of malaria cases, conducting research that led to the distribution and promotion of insecticide-treated nets (ITNs) (Tabora Urban district)

Of the 11 districts that had used data for planning, 10 also stated that they had used data for monitoring their activities, either in the previous quarter (four districts) or the past year. Igunga had used data for planning but not monitoring. Examples included:

- ▲ Noticing a decrease in deaths among children under five following the introduction of ITNs (Tunduru district)
- ▲ Noticing a decrease in the number of cholera cases following community sensitization on the use of latrines (Masasi district)
- ▲ Following Tabora Urban's introduction of ITNs in communities, they observed that the

number of malaria cases was still increasing and this led them to continue their research into the causes

4.3 Outbreak Management

Appropriate management of suspected outbreaks is key to minimizing morbidity and mortality. Ten 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 is defined as surpassing the epidemic threshold, which for most of the epidemic-prone diseases is one case. Table 9 shows the distribution of reported outbreaks among districts, with cholera being the most common disease. Only Igunga and Mpwapwa districts did not report knowledge of any suspected outbreaks during this time. If there had been more than one suspected outbreak during the period, the district was asked to consider only the most recent one during the interview.

Table 9: Suspected Outbreaks during October–December 2003

	Babati	Dodoma R.	Masasi	Mbulu	Muleba	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
AFP						X					1
Cholera		X*	X		X*		X	X		X*	6
Measles	X								X		2
Meningitis					X					X	2
Plague		X ⁴									1
Rabies				X							1

* Indicates the disease of the most recent outbreak, if more than one

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. Two districts – Mbulu and Muleba – did not follow through on any of these steps for the most recent outbreak-prone diseases that were reported. In Mbulu district it was reported that a case of rabies occurred in a hospital, which handled everything on its own without notifying the district. The CHMT was notified very late and therefore could not undertake a response. In Muleba the review of weekly surveillance reports revealed cases of cholera indicating that the epidemic threshold had been surpassed. However, during the interview the district did not report knowledge of the cholera outbreak, thus they did not investigate or respond. Another two districts – Tabora Urban and Mwanza City – showed relatively poor performance, with response being the weakest step. Tunduru had the best performance, meeting 95 percent of the criteria for overall effective outbreak management. The remaining districts scored between 74 percent and 89 percent (see Table 10). A more detailed analysis for each of the three outbreak management steps is given in the following sections.

⁴ While no cases of plague were found in the monthly reports for Dodoma Rural (see section 4.1.3), the district staff cited a suspected outbreak of plague during the interview. This inconsistency was not resolved during the visit.

Table 10: Overall Outbreak Management Performance

	Babati	Dodoma R.	Masasi	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
Disease	Measles	Cholera	Cholera	AFP	Cholera	Cholera	Measles	Cholera	
Outbreak investigation	88%	88%	75%	75%	75%	88%	88%	100%	84%
Laboratory confirmation	67%	83%	67%	67%	83%	83%	67%	83%	73%
Response to outbreak	80%	100%	80%	0%	100%	80%	20%	100%	70%
Overall	79%	89%	74%	53%	79%	84%	63%	95%	77%

Note: Represents proportion of criteria met for each step and overall

RHMT 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. Four of the regions – Dodoma, Mtwara, Rukwa, and Ruvuma – reported that there had been outbreaks and all stated that they had participated in the investigations. For all the regions this meant supporting the activities of the district in terms of supplies, logistics, equipment and budget. Ruvuma, Mtwara and Rukwa regions also provided support for the laboratory confirmation process and notified the national level about the outbreak.

Of these four, only Rukwa reported that it did not participate in the outbreak response efforts of the district. The others lent support to the CHMTs in selecting and implementing the appropriate public health response and in alerting nearby areas to the outbreak.

It should be noted that there are discrepancies in what the districts and regions reported to the data collection teams regarding the occurrence of outbreaks during the period under review. While only four of the regions stated that there had been outbreaks in their districts, districts in *all* of the regions reported outbreaks during their interviews (Table 11). The discrepancies for Mbulu and Muleba districts can be accounted for by the fact that the suspected outbreaks were identified during this data collection; districts had not been aware of them at the time, thus they were not reported to the respective regions.

Table 11: Reporting of Outbreaks in Districts and Regions

Regions	Districts	District reported outbreak	Region reported outbreak
Dodoma	Dodoma Rural	Yes	Yes
	Mpwapwa	No	
Kagera	Muleba	Yes	No
Manyara	Babati	Yes	No
	Mbulu	Yes	
Mtwara	Masasi	Yes	Yes
Mwanza	Mwanza City	Yes	No
Rukwa	Nkasi	Yes	Yes
	Sumbawanga Rural	Yes	
Ruvuma	Tunduru	Yes	Yes
Tabora	Tabora Urban	Yes	No
	Igunga	No	

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

Tunduru was the only district to meet all of the criteria for an appropriate investigation, in this case for a suspected outbreak of cholera. Nonetheless, performance was strong in the rest of the districts, where an average of 84 percent of the criteria (seven of the eight tasks) were met (see Table 12). Timely notification of the outbreak to the district posed the greatest problem, with only four districts being notified within 24 hours from the date the threshold was met (Dodoma Rural, Nkasi, Tabora Urban, and Tunduru). Of the six districts that analyzed case-based data collected during the investigation, all used place (geographic) analysis.

Table 12: District Performance in Outbreak Investigation

	Babati	Dodoma R.	Masasi	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
Disease	Measles	Cholera	Cholera	AFP	Cholera	Cholera	Measles	Cholera	
Timely notification		X			X		X	X	4
Confirm diagnosis	X	X	X	X	X	X	X	X	8
Prepare investigation	X	X	X	X		X	X	X	7
Search records	X		X	X	X	X	X	X	7
Search facilities	X	X		X	X	X	X	X	7
Search community	X	X	X	X		X	X	X	7
Collect case information	X	X	X	X	X	X	X	X	8
Analyze data	X	X	X		X	X		X	6
TOTAL	88%	88%	75%	75%	75%	88%	88%	100%	84%

4.3.2 Effective Laboratory Confirmation Process

A series of questions regarding the laboratory confirmation process was 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.

Only half of the eight districts that collected specimens during outbreaks took the appropriate number of samples (Babati, Mwanza City, Tabora Urban, and Tunduru).

According to the district teams interviewed (see Table 13), the majority of specimens were sent within the appropriate timeframe following collection, with appropriate documentation, and were handled/transported correctly to an appropriate laboratory, generally the regional or national laboratories. Only half of these districts received a results report from the referral laboratory. In all of these cases the laboratory results confirmed the disease in question.

Table 13: District Performance in Laboratory Confirmation

	Babati	Dodoma R.	Masasi	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
Disease	Measles	Cholera	Cholera	AFP	Cholera	Cholera	Measles	Cholera	
Appropriate # samples	X			X			X	X	4
Appropriate documentation	X	X	X	X	X	X	X		7
Appropriate handling & transport	X	X	X	X	X	X	X	X	8
Appropriate laboratory	X	X	X	X	X	X	X	X	8
Appropriate timeframe		X	X		X	X		X	5
Lab confirmation received		X			X	X		X	4
TOTAL	67%	83%	67%	67%	83%	83%	67%	83%	73%

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

Of the eight districts that took response actions, seven of the CHMTs met to discuss and plan the response (Mwanza City did not). Most (5/8) of the teams met on a daily or weekly basis during the outbreak. Six of the districts cited data as a basis for their response. Six districts provided information to communities, including how to prevent the disease, symptoms to watch for and actions to take if a person becomes ill, and took appropriate disease-specific actions. Only four of the districts wrote an outbreak report, three of which included case-based data.

Table 14: District Performance in Outbreak Response

	Babati	Dodoma R.	Masasi	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
Disease	Measles	Cholera	Cholera	AFP	Cholera	Cholera	Measles	Cholera	
CHMT meets	X	X	X		X	X	X	X	7
Response based on data	X	X	X		X	X		X	6
Inform community	X	X	X		X	X		X	6
Disease-specific actions	X	X	X		X	X		X	6
Report with case-based data		X			X			X	3
TOTAL	80%	100%	80%	0%	100%	80%	20%	100%	70%

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. Fifty percent of districts with outbreaks met all three criteria (Babati, Dodoma Rural, Masasi, Nkasi, and Tunduru), whereas the remaining districts met none of the criteria. Several recommendations were made for improving management of future outbreaks, including:

- ▲ Reinforcing cold chain management (Babati)
- ▲ Addressing health worker allowances (Tunduru)
- ▲ Assuring the availability of drug buffer stocks (Masasi, Tunduru and Nkasi)
- ▲ Improving multisectoral collaboration (Nkasi)
- ▲ Improving communication with distant facilities (Nkasi)

Many of these recommendations had already been implemented at the time of the interview.

4.3.4 Case Fatality Rates

Calculating case fatality rates (CFR) 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. During the period October to December 2003, six districts reported cases of cholera, nine districts reported cases of meningitis, and no districts reported yellow fever. During interviews, only Dodoma Rural and Nkasi districts reported that they had calculated their own case fatality rates. However, data in weekly health facility reports for the same period allowed for calculation of CFRs by district (Table 15).

Table 15: Case Fatality Rates for Cholera and Meningitis, October–December 2003

Disease	Cholera			Meningitis		
	Cases	Deaths	CFR	Cases	Deaths	CFR
Babati	0	0		2	0	0.0%
Dodoma Rural	127	5	3.9%	0	0	
Igunga	0	0		8	1	12.5%
Masasi	1860	29	1.6%	3	3	100.0%
Mbulu	0	0		0	0	
Mpwapwa	0	0		4	0	0.0%
Muleba	17	0	0.0%	13	0	0.0%
Mwanza City	0	0		28	8	28.6%
Nkasi	72	3	4.2%	3	0	0.0%
Sumbawanga R.	4	0	0.0%	0	0	
Tabora Urban	0	0		8	1	12.5%
Tunduru	10	0	0.0%	5	1	20.0%
TOTAL	2090	37	1.8%	74	14	18.9%
TARGET			1.0%			10.0%

The WHO/AFRO target case fatality rates are 1 percent for cholera and 10 percent for meningitis. Three of six districts with cholera outbreaks did not meet the 1 percent CFR target, and five of nine districts with meningitis outbreaks had CFRs above the 10 percent target. Districts with CFRs below the targets for cholera and meningitis had no deaths from these diseases. Masasi had a very low CFR for cholera considering the large number of cases.

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

At the time of this data collection exercise, six months after the workshops, districts were asked to provide these plans for review. All 12 districts had plans available, and it appeared that many of the districts had also updated their plans following the workshops. For instance, the Mbulu plan was updated in September/October 2003; Masasi in December 2003; and Babati in January 2004. Table 16 below shows that six of the plans included all of the original elements, whereas the remaining six plans reviewed were missing various sections. The forecasting section was missing most often, probably due to the fact that districts needed to review several years' worth of epidemiological data in order to attempt to forecast potential outbreaks. For all of the plans combined, 83 percent of the expected elements were present. In some districts there were no separate updated plans, but some components were included in the most recent Comprehensive Council Health Plans (CCHPs) (such as provisions for the purchase of buffer stocks or measures to improve reporting).

Table 16: 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		X	X	X	11
Staffing	X	X	X	X	X	X	X	X	X		X		10
Buffer stocks	X	X	X	X	X	X	X	X	X		X	X	11
Training	X	X	X	X	X	X	X	X	X	X	X	X	12
Health education	X	X	X	X	X	X	X	X	X		X		10
Written / Updated	Jan 04	Aug 03	Aug 03	Dec 03	Sept 03	Aug 03	Aug 03	Aug 03	Aug 03	Aug 03	Aug 03	Aug 03	
TOTAL (of 6)	5	6	6	6	5	5	6	6	4	2	6	3	83%

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 EPI 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 17 shows that eight of the districts were able to meet more than half of the criteria for this indicator, while only six met all of the criteria. The element that scored lowest for all districts was inviting individuals from other parts or outside of the health system to meetings where IDSR was discussed; only seven of the 12 districts achieved this, as opposed to 10 districts meeting the other criteria. Overall, 93 percent of the criteria were met.

Table 17: Elements of Linkages Within and Outside the Health 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	7
TOTAL (of 4)	4	4	2	4	3	3	1	2	4	4	2	4	93%

Numerous examples were provided of how the health team had coordinated with others regarding surveillance:

- ▲ Data on dog bites were shared with the Veterinary Department and Community Development, leading to vaccination of dogs to prevent rabies. (Mwanza City, Mbulu, Tunduru, Sumbawanga Rural, and Dodoma Rural)
- ▲ Nkasi district has a Health, Education and Water Committee to which the district medical officer gives reports of disease trends.
- ▲ Coordination of resources is particularly common in the case of outbreaks, when vehicles, motorcycles, and even boats belonging to vertical programs or other sectors are shared to

assist with investigation and response efforts. In Masasi and Mpwapwa districts, teachers were provided to work with health staff during an outbreak.

- ▲ Various community groups have been involved in disease prevention activities, such as environmental clean-up campaigns and sensitization during outbreaks. These include village/ward leaders, extension workers, and religious organizations. Mwanza City district worked with voluntary counseling and testing centers and religious facilities for distribution of ITNs for malaria prevention.
- ▲ Meetings with other programs/sectors are most common during outbreaks and in preparation for immunization campaigns. Mwanza City Council met with religious organizations to prepare their epidemic preparedness plan. Tunduru held a District Management Team meeting that involved different members from all sectors.

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.

Overall results were good: three of the districts (Dodoma Rural, Igunga, and Mpwapwa) were able to meet the criteria for planning and implementing all of the suggested activities, including implementation of 80 percent or more of planned supervision visits. All of the other districts met three of the planning criteria and two or three of the implementation criteria. Details are described in the following sections.

4.4.2.1 Supervision

All of the districts had included supervision visits to their health facilities in their CCHPs. Table 18 below shows that, for the October–December period, half of the districts planned to carry out supervision visits at a rate of one visit per facility per month. Another two districts planned to visit each facility once per quarter. The remaining two districts planned to visit only half of their facilities during the quarter. On average, districts implemented 33 percent of their planned supervision visits for the previous quarter. The best performing districts were Dodoma Rural, Igunga and Tabora Urban. However, the first two of these districts also had the fewest visits planned, proportional to the number of facilities. Among the districts that planned monthly visits, Babati and Mbulu were able to implement the most, (about 60 percent). Most of the districts that planned quarterly supervision visits had generally high implementation rates. In four of the districts (Masasi, Muleba, Nkasi, Sumbawanga Rural) documentation on how many supervision visits had been carried out was poor or not available. Data collectors did not seek to determine whether IDSR issues had been addressed during these supervision visits.

Table 18: Planning and Implementation of Supervision Visits, October–December 2003

	Babati	Dodoma R.	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza C.	Nkasi	S'wanga R.	Tabora U.	Tunduru	Total
1 visit / month planned	X			X	X				X	X		X	
1 visit / quarter planned						X	X	X			X		
1 visit / 50% facilities / quarter planned		X	X										
Planned visits implemented	59%	100%	100%	NA	58%	94%	NA	65%	NA	NA	100%	33%	33%

4.4.2.2 IDSR Review Meetings

Six of the districts had planned meetings that reported on or reviewed IDSR activities. All of these meetings were held, and three other districts also held meetings that had not been included in their CCHPs. It was observed during discussion that most of the CHMTs had a timetable of monthly meetings, while some districts held quarterly meetings specifically to discuss IDSR and Mwanza City held public meetings on the control of waterborne diseases. Babati, Muleba, and Tabora Urban districts did not hold any meetings in the previous quarter at which IDSR activities were discussed.

4.4.2.3 IDSR Training

Ten of the districts had planned training related to IDSR during 2003 and carried out their plans. Examples of training topics included data collection for infectious disease and reporting, use of line lists and measles outbreak reporting (Mwanza City), disease surveillance and data management (Igunga), infectious disease prevention (Nkasi), and malaria case management (Tabora Urban).

4.4.2.4 Prevention of Priority Diseases

All of the districts had included activities to prevent priority infectious diseases in their 2003 CCHPs, and all but one district (Masasi) carried out prevention activities during the October–December quarter. Examples include promotion of insecticide-treated nets, vaccination campaigns, and environmental sanitation activities.

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, case investigation forms (disease-specific and generic), weekly and monthly reporting forms, and standard case definitions. Facility 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. Overall, less than 2 percent of health facilities had all of the tools

available and only 22 percent had more than half of the eight tools. On average, facilities had four of the tools available. As Table 19 below shows, these were most likely to be the register, weekly and monthly reporting forms, and standard case definitions. All of the different case investigation forms were consistently in short supply. Only 7 percent of the facilities had the generic case investigation form, which covers several diseases. There was no significant variability among the districts in terms of the expected proportion of tools that were actually available, with a low of 35 percent in Masasi and a high of 67 percent in Dodoma Rural. There was notable variability among facilities within some districts.

Table 19: 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)
Register	100	100	100	90	100	100	100	100	100	100	100	100	99%
CIF – AFP	38	50	14	10	14	22	33	8	0	0	0	13	17%
CIF – NNT	50	67	0	10	14	22	33	8	29	8	0	50	24%
CIF – Measles	25	50	14	10	14	22	33	8	0	0	0	38	18%
CIF – Generic	25	25	0	10	0	0	0	0	0	0	0	13	7%
Weekly forms	100	67	43	30	71	89	83	23	100	92	75	38	65%
Monthly forms	75	92	57	80	71	100	67	38	86	100	50	88	76%
Standard case definitions	75	83	100	40	71	89	83	77	71	92	88	88	79%
Proportion of expected tools available for each district													
	61%	67%	41%	35%	45%	56%	54%	33%	48%	49%	39%	53%	48%

Note: CIF = Case investigation form

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 about whether they had received feedback from the Ministry of Health on IDSR issues during the previous quarter. Among the eight regions, only three received feedback on new policies and guidelines, one region received aggregated data, four received feedback on quality of IDSR reports, and two received assistance on how to conduct IDSR tasks. Manyara region did not report receiving any type of feedback from the MOH, while Mtwara, Mwanza, and Tabora regions received two types of feedback.

Table 20: Regions Regularly Receiving Feedback from MOH

Regions	Policies / technical updates	Aggregated or compared data	Quality of reports	Assistance with tasks
Dodoma				X
Kagera	X			
Manyara				
Mtwara	X		X	
Mwanza		X	X	
Rukwa			X	
Ruvuma	X			
Tabora			X	X
TOTAL	3	1	4	2

4.4.4.2 Feedback from Regions to Districts

As Table 21 shows, feedback from regions to districts was quite varied. While five of the districts reported receiving more than two types of feedback for the quarter, only one district (Nkasi) received all four. Nkasi and Sumbawanga Rural are in the same region (Rukwa), but Sumbawanga Rural did not report receiving any updates or assistance with IDSR tasks. Districts in Kagera, Manyara, and Mwanza regions did not receive any of the specified feedback during the period. About half of the districts responded that they had received feedback regarding the quality of their surveillance reports and assistance in carrying out their IDSR responsibilities. Only four districts reported feedback of aggregated or comparative data.

Table 21: Districts Regularly Receiving Feedback from Regions

Regions	Districts	Policies / technical updates	Aggregated or compared data	Quality of reports	Assistance with tasks
Dodoma	Dodoma Rural			X	X
	Mpwapwa	X			X
Kagera	Muleba				
Manyara	Babati				
	Mbulu				
Mtwara	Masasi	X		X	X
Mwanza	Mwanza City				
Rukwa	Nkasi	X	X	X	X
	Sumbawanga Rural		X	X	
Ruvuma	Tunduru		X	X	X

Tabora	Tabora Urban	X		X	X
	Igunga	X	X	X	
TOTAL		42%	33%	58%	50%

Some examples of feedback received include:

- ▲ *Policies/technical updates*: the appropriate reporting period for weekly reports (i.e. which days are covered by a report), samples of correct forms to use for reporting.
- ▲ *Aggregated/comparative data*: annual reports, reporting coverage in other districts.
- ▲ *Quality of reports*: Tunduru received feedback that information for cholera cases had not been correctly filled, and Dodoma Rural also received directions on how to complete the forms correctly. Contrary to the common myth that feedback is usually negative, Nkasi and Sumbawanga Rural both received feedback from Rukwa region that their reports were of good quality and received on time.
- ▲ *Assistance with IDSR responsibilities*: Tabora Urban district worked with the regional team to modify the measles case investigation form, and then received instructions on how to complete it. Other districts received training on how to conduct investigations and manage cholera outbreaks. Several districts noted that since the regions do not receive funds from the MOH, they cannot plan any activities. It is up to the district to request (and fund) assistance from the region.

4.4.4.3 Feedback from Districts to Facilities

Nkasi district had designed a specific form for providing feedback to all health facilities on a quarterly basis. This consisted of a list of all health facilities and months (January to December) where the performance of each facility on timeliness and completeness of monthly reports was filled. The forms were found at health facilities during the data collectors' visits.

Feedback from districts to health facilities is significantly weaker than feedback from regions to districts. Overall, 40 percent of health facilities interviewed reported that they did not receive any type of feedback (as defined above) during the preceding quarter; this varied from a low of 8 percent in Dodoma Rural to a high of 92 percent in Mwanza City. No facilities received all four types of feedback, while one-third of health facilities received one type of feedback. Approximately 30 percent of facilities received technical/policy updates, feedback on quality of reports, or assistance from the district, while only 7 percent received aggregated or compiled data. Mpwapwa district performed the best, providing at least two types of feedback to 22 percent of its facilities. Table 22 shows the performance of each district in terms of the proportion of facilities that received each type of feedback.

Table 22: Facilities Regularly Receiving Feedback from Districts

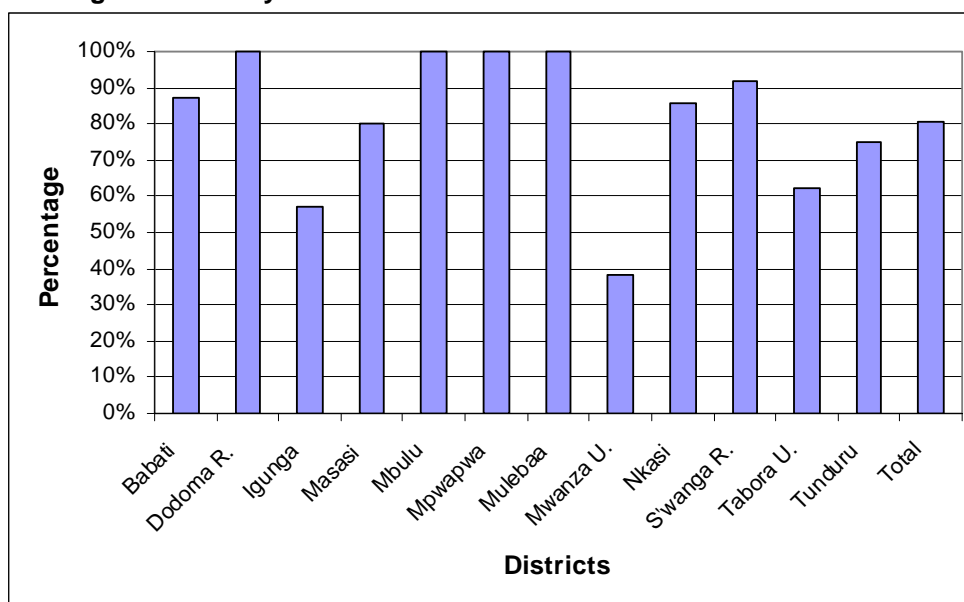
Districts	Policies / technical updates	Aggregated or compared data	Quality of reports	Assistance with tasks
Babati	0%	13%	13%	25%
Dodoma Rural	58%	8%	25%	25%
Igunga	29%	0%	29%	43%
Masasi	50%	0%	10%	40%
Mbulu	14%	14%	43%	14%
Mpwapwa	44%	0%	78%	56%
Muleba	50%	67%	33%	33%
Mwanza City	0%	0%	8%	8%
Nkasi	71%	0%	71%	43%
Sumbawanga R.	33%	0%	17%	33%
Tabora Urban	0%	0%	13%	25%
Tunduru	25%	0%	50%	25%
TOTAL	31%	7%	30%	30%

Feedback to different facilities within a district was often variable. For example, the Babati District Hospital reported receiving three types of feedback, while all but one of the other seven facilities interviewed reported zero. The case is similar for Masasi, Mbulu, and Igunga districts.

4.4.4.4 Feedback from Facilities to Communities

Figure 8 shows the proportion of facilities in each district that at least once during the previous quarter had provided feedback to communities related to infectious diseases that had occurred in the community. The majority of facilities were performing well, with eight districts achieving 80 percent or more. The fewest facilities were providing feedback in Mwanza City, Igunga, and Tabora Urban districts.

Figure 8: 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 23 summarizes participation in the survey by district and facility level.

Table 23: Participation in Attitude and Motivation Survey

Districts	Dispensary	Health Center	Hospital	Total
Babati	8	2	5	15
Dodoma Rural	18	5	8	31
Igunga	8	2	5	15
Masasi	14	2	4	20
Mbulu	6	2	2	10
Mpwapwa	12	3	6	21
Muleba	5	3	4	12
Mwanza City	17	2	5	24
Nkasi	11	3	5	19
Sumbawanga Rural	17	0	5	22
Tabora Urban	10	2	2	14
Tunduru	10	1	4	15
TOTAL	136	27	55	218

Health workers were asked to identify their type of profession and from the various responses they were grouped into the following five categories: clinicians (including physicians, medical officers, and clinical officers), nurses, aides/attendants, laboratory staff, and health officers. Participation by each type of health worker is presented in Table 24.

Table 24: Types of Health Workers Surveyed

Type	Number	Proportion
Clinicians	98	45%
Nurses	63	29%
Aides/Attendants	25	11%
Lab Staff	6	3%
Health Officers	26	12%
Total	218	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 H.

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 by the use of 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 analyzes in this section.)

As Figure 9 below shows, health workers expressed overall satisfaction with the different aspects of their IDSR work, with the notable exception of educational and training opportunities to strengthen their IDSR skills. Only 40 percent of health workers were satisfied with this. When analyzed by district, Nkasi and Mpwapwa districts showed the highest levels of worker satisfaction, with an average of 84 percent of health workers giving positive responses across the different aspects. Staff in Mwanza City and Babati had the lowest levels of satisfaction, at 52 percent and 56 percent respectively. There was little difference in results for the different types of health workers, with the exception of laboratory staff. Although these represented a small proportion of the sample, their low levels of satisfaction (52 percent) indicate that this important group has not been sufficiently involved in IDSR efforts.

Figure 9: Level of Satisfaction with Aspects of IDSR Work



4.4.5.2 Difficulties Encountered

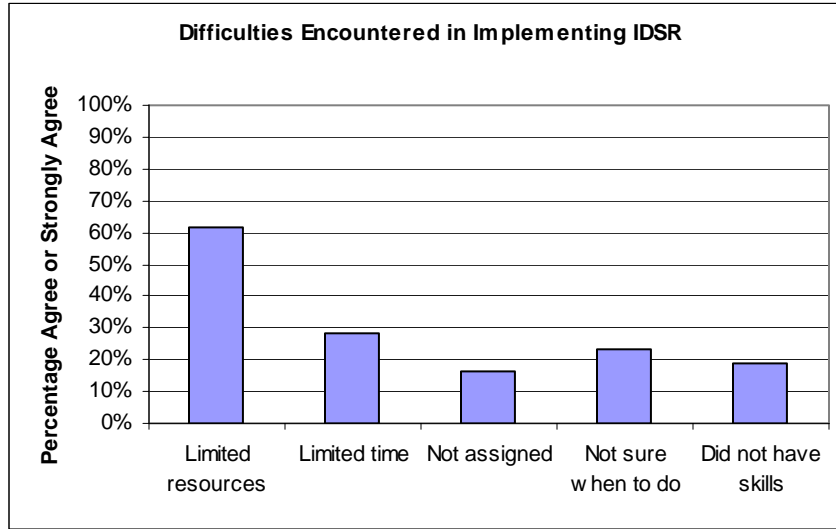
This section asked health workers about difficulties or obstacles encountered (if any) in carrying out IDSR tasks, specifically referring to the three-month period prior to the survey. People were asked to rate their level of agreement with the following statements, using a scale from strongly disagree 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 most significant constraint that health workers identified was limited resources (62 percent agree or strongly agree). Limited time was also a factor for nearly one-third of respondents, but relatively few people indicated that they did not know their tasks or when and how to carry them out. (Figure 10) The districts that expressed difficulties the most often were Mwanza City and Igunga, with approximately 42 percent of respondents agreeing with the above statements of limitations. Sumbawanga Rural district had the fewest staff (17 percent) who agreed that these factors were obstacles to their IDSR work, followed by Dodoma Rural, Mpwapwa and Muleba, all at around 23 percent.

Among different categories of health workers, 70 percent of laboratory staff felt that they had difficulties in carrying out their work, chiefly due to a lack of resources and time and not knowing when tasks needed to be done. Very few (33 percent) said that they did not have the necessary skills. One-third of nurses also expressed that they were not sure when tasks should be done. Health officers had the lowest level of difficulty in doing their jobs.

Figure 10: Difficulties Encountered in Carrying Out IDSR



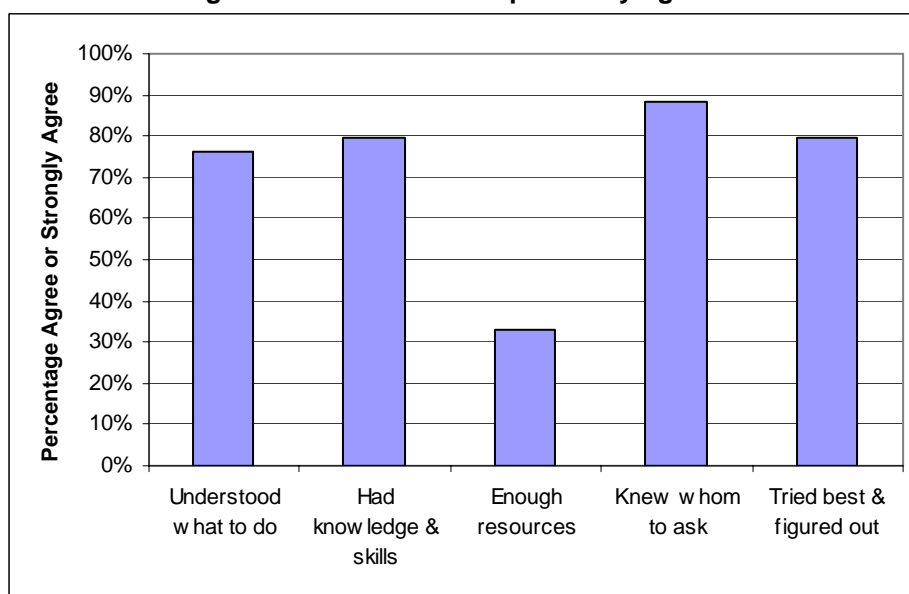
4.4.5.3 Assets that Help

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

The majority of health workers reported that they had the knowledge and skills to do their surveillance/response tasks and knew whom to ask if they had questions or problems (80 percent and 89 percent, respectively) (Figure 11). They also showed high levels of motivation, with 79 percent of respondents saying that they tried their best even when they were not sure what to do. The issue of insufficient resources was again apparent, and responses were consistent with the question on difficulties. When analyzed by district, staff in Babati and Igunga districts cited the fewest assets (60 percent and 63 percent, respectively), while those in Muleba, Tunduru and Mpwapwa cited the most (approximately 79 percent each). Among the different types of health workers surveyed, attendants expressed agreement with the most helpful factors, as evidenced by 92 percent of them saying that they figured out what to do when uncertain. Although laboratory staff cited the fewest assets, it is interesting to note that, while 33 percent felt that they did not understand what needed to be done, 67 percent still tried to figure out what to do.

Figure 11: Assets that Help in Carrying Out IDSR



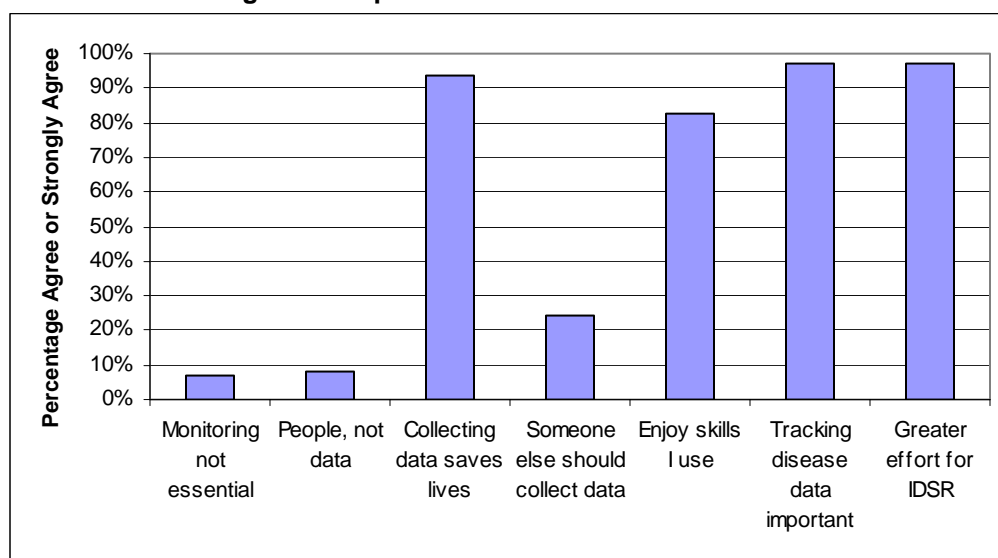
4.4.5.4 General Opinion and Feedback

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 are willing to put in a greater effort than normally expected in order to ensure that IDSR work at the facility is successful (Figure 12). A large majority also recognized that tracking disease data and reporting it to the district is an important responsibility, and that collecting such data can result in lives saved (97 percent and 94 percent, respectively). However, nearly one-quarter of all health workers surveyed felt that someone else should be hired to be responsible for collecting disease data. This sentiment was most common in Igunga and Muleba districts, with 47 percent and 42 percent of health workers in these districts expressing agreement. Another 20 percent of health workers in Babati, Mbulu, and Tabora Urban districts felt that their real job was taking care of people, not collecting data. More specifically, 14 percent of all nurses agreed that monitoring diseases is not an essential part of their work. There was little variation among districts and among different categories of personnel in responses to the positively worded questions in this section.

Figure 12: Opinions from Health Workers on IDSR



When the district results from the attitude and motivation survey were compared to the results from the report timeliness and completeness indicators, there did appear to be some correlations. For example, facilities in Nkasi district had the best overall reporting performance and also consistently expressed among the most positive attitudes. Likewise, facilities in Babati and Tabora districts had the poorest reporting performance and also scored among the lowest in terms of attitudes and motivation. This indicates that those health workers with higher levels of job satisfaction and more positive attitudes towards their work are indeed likely to produce better results.

5. Conclusions

This baseline monitoring and evaluation exercise revealed a number of areas in which the integrated disease surveillance and response system was performing well, and identified others that required strengthening. While largely confirming information that had been gathered during the 2002 situation analysis in two districts (Babati and Dodoma Rural), upon which the project design was based, this M&E baseline provides quantitative performance data upon which progress can effectively be measured. Although IDSR has been a national strategy for several years, these results suggest that it has not been effectively implemented to the degree that might be expected. This section summarizes the strengths and challenges found in project districts before implementation of key IDSR strengthening activities, and discusses next steps for using the results to strengthen IDSR.

5.1 Strengths

- ▲ **Outbreak management:** This is the component of IDSR that is most familiar to people and it is perhaps no surprise that districts performed well in it. Of the three steps, performance was strongest on outbreak investigations, although timely notification to the district was weak.
- ▲ **Planning and monitoring based on data:** Almost all of the districts indicated that they had used data to plan and monitor their activities, with the majority of examples cited being related to epidemiological data. It is unclear whether this was done as formally as is desired (given that indicators on routine data analysis and surveillance monitoring showed poor results), but the fact that districts perceive themselves to be making decisions based on data is a good start.
- ▲ **Linkages within and outside the health sector:** District health teams realize that prevention and control of infectious diseases are not their responsibility alone. Sharing data, coordinating resources, and working together with other sectors and the community to implement prevention activities are common practices.
- ▲ **Attitudes and motivation:** Health workers showed overall positive attitudes towards and motivation to perform their IDSR tasks, although some of this may be due to wanting to “say the right thing.” As expected, they expressed a desire for more resources and more education and training opportunities. Recognition by health workers that collecting and reporting surveillance data serves an important public health purpose is encouraging, and suggests that, with the appropriate tools and training, health workers will be motivated and capable of completing these tasks.

5.2 Challenges

- ▲ **Reporting:** Weekly reporting from facilities to districts is weak, with some districts not using this system at all. Monthly reporting performance is better, perhaps due to the overlap

with periods of salary collection at the district headquarters and a longer reporting period. Low levels of timeliness, completeness, and accuracy combined result in districts and regions having an incomplete picture of the disease situation. Sentinel centers for collection of reports from remote health facilities could be used to facilitate reporting.

Data management, and particularly file organization, requires strengthening at both facility and district levels. Related to this is the mechanism for submitting reports, particularly the issue of reports submitted by radio call not being individually documented. Lack of standardization of reporting forms makes it difficult to compile data. In addition, multiple and diverse reporting requirements pose a problem for health workers.

- ▲ **Routine data analysis:** Data analysis at both district and facility levels is weak. While many facilities and districts kept track of the total number of disease cases seen, very few analyzed the data at a level of detail necessary for decision making. Discussions at the facility level revealed that completion of MTUHA book two could be a good starting point for analysis. This book includes tabular summaries of almost all data collected in the facility. The fact that this format is available but is not being widely used indicates that there may be a lack of personnel with the required analysis skills or adequate motivation to carry out such analysis.
- ▲ **Feedback:** Very little feedback was being provided through all levels of the health system. Supervision visits carried out by districts on a fairly regular basis are an ideal mechanism for sharing more information about the performance of the surveillance system and for problem solving. The interest and enthusiasm exhibited by facility and district personnel during feedback sessions with the data collectors are an indication of the need for improved feedback mechanisms.

5.3 Discussion of Methods Used and Implications for Districts

This monitoring and evaluation exercise demonstrated that the indicators selected to measure performance for IDSR are feasible and instructive. Where data collection was difficult (filing of reports, etc.), this fact, in itself, was an indicator of performance issues. Although not recommended as an indicator for routine monitoring, measures of accuracy were particularly instructive. However, measuring these indicators presented somewhat of a challenge and requires clear guidance for compilation of data. Data collectors must be familiar with how information is recorded by health workers (i.e, the various, non-standard terms used) and able to decipher the handwriting and abbreviations used by health workers. Because health workers are not yet using standard case definitions and terms in their registers, there are chances of cases being missed, or counting cases that should not have been included. Using a margin of error (5 percent) helps to mitigate this problem.

5.4 Conclusions and Next Steps

It will be important for districts to continue monitoring their own performance. During IDSR training planned for all of the project districts, CHMT members will be introduced to key indicators (listed in Section 2) and tools that they can use to collect and analyze data on how the IDSR system is functioning. Further support will be provided to organize district quarterly meetings to review the status of IDSR, with particular attention given to reviewing indicators and planning interventions to address problem areas.

These results can also be used at the national level to provide a snapshot of IDSR performance in the country and to provide insights on how the system can be strengthened.

The IDSR training for CHMT members and health facility staff is expected to result in significant improvement in system functioning. It will be important at the facility level for key information to be shared with other health workers who are not trained, so that knowledge and skills do not remain centralized with one person. Follow-up data collection at the end of the IDSR project will help to see how much change has occurred and identify areas that will need more support.

This report has highlighted specific weaknesses and strengths in the IDSR system as it is operating in 12 districts throughout eight regions of Tanzania. These results have already be used to focus training and other performance improvement activities, and they serve as a quantitative measure of baseline performance, to be compared with a follow-up evaluation in mid-2005.

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	
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	

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
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
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

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
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 with scores of 1 or more in score sheet	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	
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

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
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
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)

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
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	
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

	Area to Measure	Indicator	Numerator	Denominator	Data Collection Methods		Indicator Components (where applicable)
					Frequency	Source	
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.	Community linkages	Proportion of community leaders and district officials interviewed who can cite at least 3 simple case definitions and describe the appropriate actions to take when they see these diseases	Number of community leaders and district officials interviewed who can cite at least 3 simple case definitions and describe the appropriate actions to take when they see these diseases	Total number of community leaders and district officials interviewed	Quarterly	Interviews with community leaders and district officials	
33.		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	
34.	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	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	Ussongo HC	Choma Wazazi Tambale Itumba Ziba
Masasi	Mkomaindo	Chiwale Nagaga	Mumbaka Nanyindwa Lukuledi Maratani Likokona Nanganga Memo
Mbulu	Mbulu District	Dongobesh St. Alois (Endahagchan)	Daudi Labay Pentecoste Murray Yaeda Chini
Mpwapwa	Mpwapwa	Kibakwe Rudi	Chogolo Chunyu Ipera Pwaga St. Lukes Wiyenzele
Muleba	Rubya	Kimeya Kaigara	Kagoma Karambi Kolping Kishuro Omunonazi
Mwanza City	Seko-Toure	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 DD	Kirando Kilangala	Chala Katani Mandakerenge Ntuchi
Sumbawanga Rural		Mtowisa Laela	Muze Mpui Mnokola Mititi Msanzi Mbuzza Kisumba Kasanga Kaengesa Ulumi
Tabora Urban	Kitete	Bakwata	Arthi Ipuli Kalunde Ndevelwa Isevyu Ng'ambo
Tunduru	Tunduru District	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	0%	69%	73%	1%	74%	66%	32%	7%
	Timeliness of monthly reporting to region	47%	83%	80%	0%	62%	92%	8%	94%
	Completeness of weekly reporting to region	0%	71%	73%	31%	74%	75%	32%	90%
	Completeness of monthly reporting to region	80%	100%	80%	60%	67%	100%	50%	100%
Use of Surveillance Data	Surveillance monitoring (score of 3)	1	1	0	2	0	0	3	0
Outbreak Management	Investigation of and response to outbreaks (score of 2)	2	NA	NA	2	NA	1	2	NA
Management of IDSR System	Feedback to regions from MOH (score of 4)	1	1	0	2	2	1	1	2

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	66%	72%	75%	81%	72%	75%	91%	88%	66%	63%	56%	66%
	Timeliness of weekly reporting to region	7%	No reports	0%	No reports	0%	0%	18%	19%	8%	6%	4%	Not tracking
	Timeliness of monthly reporting to region	8%	43%	26%	No reports	12%	33%	10%	9%	38%	23%	3%	56%
	Completeness of weekly reporting to region	13%	No reports	20%	No reports	8%	3%	24%	20%	48%	29%	15%	1%
	Completeness of monthly reporting to region	11%	53%	43%	28%	22%	38%	17%	9%	52%	47%	7%	71%
	Reporting of priority diseases using case investigation forms	38%	0%	NA	0%	NA	0%	0%	3%	0%	0%	6%	6%
Use of Surveillance Data	Routine analysis of data (score of 3)	0	0	0	0	0	0	0	0	2	0	0	0
	Surveillance monitoring (score of 3)	0	1	0	0	0	0	0	0	0	0	0	0
	Planning and monitoring based on data (score of 2)	2	2	1	2	2	2	0	2	2	2	2	2
Outbreak Management	Appropriate investigation of suspected outbreaks	88%	88%	NA	75%	NA	NA	NA	75%	75%	88%	88%	100%
	Effective laboratory confirmation process	67%	83%	NA	67%	NA	NA	NA	67%	83%	83%	67%	83%

District Indicators		Babati	Dodoma Rural	Igunga	Masasi	Mbulu	Mpwapwa	Muleba	Mwanza City	Nkasi	S'wanga Rural	Tabora Urban	Tunduru
	Appropriate response to confirmed outbreaks	80%	100%	NA	80%	NA	NA	NA	0%	100%	80%	20%	100%
	Outbreak preparedness (score of 6)	5	6	6	6	5	5	6	6	4	2	6	3
	Evaluation of outbreak management (score of 3)	3	3	NA	3	0	NA	0	Missing	3	0	0	3
	CFR Cholera	NA	3.9%	NA	1.6%	NA	NA	0%	NA	4.2%	0%	NA	0%
	CFR Meningitia	0%	NA	12.5%	100%	NA	0%	0%	28.6%	0%	NA	12.5%	20%
Management of IDSR System	Feedback to districts from region (score of 4)	0	2	3	3	0	2	0	0	4	2	3	3
	Communication and coordination within and outside health sector (score of 4)	4	4	2	4	3	3	1	2	4	4	2	4
	IDSR activity planning (score of 4)	3	4	4	3	3	4	3	4	3	3	3	3
	Implementation of IDSR activities (score of 4)	2	4	4	1	2	4	2	3	4	3	3	2

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	86%	83%	84%	88%	84%	84%	83%	85%	80%	88%	88%	87%
Use of Surveillance Data	Routine analysis of data (% expected criteria met for all facilities in district)	0%	6%	7%	0%	4%	0%	13%	0%	4%	4%	0%	0%
Management of IDSR System	Feedback to facilities from district (% expected criteria met for all facilities in district)	13%	29%	25%	25%	21%	44%	46%	4%	46%	21%	9%	25%
	Availability of tools / job aids for IDSR (% expected tools available in each district)	61%	67%	41%	35%	45%	56%	54%	33%	48%	49%	39%	53%
	Feedback to communities on IDSR (% all facilities providing feedback)	88%	100%	57%	80%	100%	100%	100%	39%	86%	92%	63%	75%

Annex D. Summary of Cases and Deaths Recorded in Facilities

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

Disease Condition	Number of Cases Recorded		Number of Deaths Recorded	
	Register Review	Facility Reports	Register Review	Facility Reports
Malaria	15,225	19,023	55	68
Pneumonia	2,030	2,370	2	13
Diarrhoea some dehydration	1,902	2,490	1	8
Severe pneumonia	362	171	5	21
Bacillary dysentery	272	329	1	1
Typhoid	102	187	1	3
Diarrhoea severe dehydration	89	135	1	10
Animal/dog bites	73	87	0	1
Meningitis	24	14	5	1
Measles	7	7	0	0
Cholera	4	16	0	1
AFP	0	5	0	0
Rabies	0	1	0	1
Neonatal tetanus	0	0	0	0
Plague	0	0	0	0
Yellow fever	0	0	0	0

Annex E. Facility Report Accuracy Results by Facility and District

District	Health Facility	Accuracy – cases (%)	Accuracy – deaths (%)	Overall accuracy of report
BABATI	MWADA	69	100	84
	GALLAPO	75	100	88
	MAGUGU	63	100	81
	DAREDA KATI	88	100	94
	MAMIRE	69	100	84
	Average	73	100	86
	<i>Maximum</i>	<i>88</i>	<i>100</i>	<i>94</i>
	<i>Minimum</i>	<i>63</i>	<i>100</i>	<i>81</i>
	<i>Difference</i>	<i>25</i>	<i>0</i>	<i>13</i>
DODOMA R	BAHI-SOKONI	69	100	84
	KIGWE	69	100	84
	ISANGHA	75	100	88
	CHAMWINO	63	100	81
	MLOWA BARABARANI	63	100	81
	HANETI	63	100	81
	MANZASE	81	100	91
	HUMEKWA	81	100	91
	MVUMI (OPD)	63	100	81
	NKHOME	69	100	84
	MVUMI (IPD)	63	88	75
	MNKOLA	63	94	78
	HANETI	63	100	81
	BUIGIRI	69	100	84
	Average	68	99	83
	<i>Maximum</i>	<i>81</i>	<i>100</i>	<i>91</i>
<i>Minimum</i>	<i>63</i>	<i>88</i>	<i>75</i>	
	<i>Difference</i>	<i>19</i>	<i>13</i>	<i>16</i>
IGUNGA	CHOMA	69	100	84
	USSONGO	56	100	78
	ZIBA	63	100	81
	WAZAZI	81	100	91
	TAMBALALE	69	100	84

District	Health Facility	Accuracy – cases (%)	Accuracy – deaths (%)	Overall accuracy of report
	ITUMBA	75	100	88
	Average	69	100	84
	<i>Maximum</i>	<i>81</i>	<i>100</i>	<i>91</i>
	<i>Minimum</i>	<i>56</i>	<i>100</i>	<i>78</i>
	<i>Difference</i>	<i>25</i>	<i>0</i>	<i>13</i>
MASASI	NANYINDWA	81	100	91
	LUKULEDI	69	100	84
	CHIWALE	75	100	88
	LIKOKONA	81	100	91
	Average	77	100	88
	<i>Maximum</i>	<i>81</i>	<i>100</i>	<i>91</i>
	<i>Minimum</i>	<i>69</i>	<i>100</i>	<i>84</i>
	<i>Difference</i>	<i>13</i>	<i>0</i>	<i>6</i>
MBULU	DONGOBESE	81	100	91
	LABAY PENT	69	100	84
	MURRAY	75	100	88
	MBULU	50	81	66
	DAUDI	81	100	91
	Average	71	96	84
	<i>Maximum</i>	<i>81</i>	<i>100</i>	<i>91</i>
	<i>Minimum</i>	<i>50</i>	<i>81</i>	<i>66</i>
	<i>Difference</i>	<i>31</i>	<i>19</i>	<i>25</i>
MPWAPWA	WIYENZELE	81	100	91
	KIBAKWE	75	88	81
	CHAMWINO	81	94	88
	CHOGOLA	81	100	91
	CHUNYU	81	94	88
	IPERA	81	100	91
	RUDI (IPD)	75	100	88
	MPWAPWA	50	63	56
	Average	76	92	84
	<i>Maximum</i>	<i>81</i>	<i>100</i>	<i>91</i>
	<i>Minimum</i>	<i>50</i>	<i>63</i>	<i>56</i>
	<i>Difference</i>	<i>31</i>	<i>38</i>	<i>34</i>
MULEBA	RUBYA DDH (IPD)	56	94	75
	RUBYA DDH (OPD)	63	94	78
	OMURONAZI	75	100	88
	KIMEYA	69	88	78
	KISHURO	63	100	81
	KAGOMA (OPD)	81	100	91
	KAGOMA (IPD)	81	100	91

District	Health Facility	Accuracy – cases (%)	Accuracy – deaths (%)	Overall accuracy of report
	Average	70	96	83
	<i>Maximum</i>	81	100	91
	<i>Minimum</i>	56	88	75
	<i>Difference</i>	25	13	16
MWANZA CITY	S'TOURE OPD	50	100	75
	CORNER	75	100	88
	KARUME	56	100	78
	HURUMA	75	100	88
	AMANI CHOGO	75	100	88
	KAHAMA MIRONGO	69	100	84
	AL-IJUMA	69	100	84
	TNC MKUYUNI	100	100	100
	SEKEO TOURE	63	88	75
	NYAKAHOJA	75	100	88
	Average	71	99	85
	<i>Maximum</i>	100	100	100
	<i>Minimum</i>	50	88	75
	<i>Difference</i>	50	13	25
NKASI	KILANGALA	75	100	88
	NAMANYERE DDH (IPD)	44	56	50
	NTUCHI	69	100	84
	KATANI	100	100	100
	KIRANDO	63	88	75
	MANDAKERENGE	75	88	81
	CHALA	81	100	91
	NAMANYERE DDH (OPD)	50	100	75
	Average	70	91	80
	<i>Maximum</i>	100	100	100
	<i>Minimum</i>	44	56	50
	<i>Difference</i>	56	44	50
SUMBAWANGA RURAL	MTOWISA	75	100	88
	KISUMBA KASOTE	81	100	91
	ULUMI	56	94	75
	MBUZA	88	100	94
	MSANZI	75	100	88
	MITITI	81	100	91
	KASANGA	81	100	91
	MNOKOLA	75	100	88
	MUZE	69	100	84
	Average	76	99	88
	<i>Maximum</i>	88	100	94
	<i>Minimum</i>	56	94	75

District	Health Facility	Accuracy – cases (%)	Accuracy – deaths (%)	Overall accuracy of report
	<i>Difference</i>	31	6	19
TABORA	ARDHI	81	100	91
URBAN	NDEVELWA	81	100	91
	KALUNDE	81	100	91
	IPULI	63	100	81
	Average	77	100	88
	<i>Maximum</i>	81	100	91
	<i>Minimum</i>	63	100	81
	<i>Difference</i>	19	0	9
TUNDURU	NAKAPANYA	75	100	88
	TUNDURU	75	100	88
	LIGUNGA	81	100	91
	AZIMIO	56	100	78
	LIGOMA	81	100	91
	Average	74	100	87
	<i>Maximum</i>	81	100	91
	<i>Minimum</i>	56	100	78
	<i>Difference</i>	25	0	13
TOTAL	Average	72	98	85
	<i>Maximum</i>	100	100	100
	<i>Minimum</i>	44	56	50
	<i>Difference</i>	56	44	50

Annex F. District Report Accuracy Results by District

District	Accuracy – cases (%)	Accuracy – deaths (%)	Overall accuracy of report
BABATI	56	75	66
DODOMA R	56	88	72
IGUNGA	50	100	75
MASASI	81	81	81
MBULU	63	81	72
MPWAPWA	50	100	75
MULEBA	88	94	91
MWANZA CITY	75	100	88
NKASI	56	75	66
SUMBAWANGA R	31	94	63
TABORA U	38	75	56
TUNDURU	56	75	66
Average	58	86	72
<i>Maximum</i>	<i>88</i>	<i>100</i>	<i>91</i>
<i>Minimum</i>	<i>31</i>	<i>75</i>	<i>56</i>
<i>Difference</i>	<i>56</i>	<i>25</i>	<i>34</i>

Annex G. Summary of Cases and Deaths Recorded in Districts

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

Disease Condition	Number of Cases Recorded		Number of Deaths Recorded	
	Record Review	District Reports	Record Review	District Reports
Malaria	41,391	35,450	84	89
Diarrhoea some dehydration	6,706	4,703	9	16
Pneumonia	5,601	4,728	13	23
Bacillary dysentery	1,073	985	1	1
Severe pneumonia	590	511	29	22
Diarrhoea severe dehydration	340	607	11	17
Typhoid	238	267	2	2
Animal/dog bites	89	272	2	1
Cholera	45	97	2	4
Meningitis	6	17	2	3
Measles	5	4	0	1
AFP	2	1	0	0
Rabies	0	1	0	1
Neonatal tetanus	0	0	0	0
Plague	0	0	0	0
Yellow fever	0	0	0	0

Annex H. 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
	N	15	31	15	20	10	21	12	24	19	22	14	15	218
Co-workers	n %	13 86.7	29 93.6	12 80.0	14 70.0	9 90.0	20 95.2	12 100.0	18 75.0	19 100.0	19 86.4	9 64.3	13 86.7	187 85.8
Supervisor's support	n %	9 60.0	25 80.7	12 80.0	12 60.0	7 70.0	18 85.7	8 66.7	12 50.0	18 94.7	18 81.8	10 71.4	13 86.7	162 74.3
Responsibilities	n %	10 66.7	26 83.9	10 66.7	18 90.0	6 60.0	21 100.0	11 91.7	12 50.0	18 94.7	18 81.8	10 71.4	12 80.0	172 78.9
Management of IDSR	n %	6 40.0	21 67.7	7 46.7	11 55.0	6 60.0	18 85.7	7 58.3	10 41.7	16 84.2	18 81.8	10 71.4	11 73.3	141 64.7
Opportunity to use abilities	n %	10 66.7	26 83.9	12 80.0	17 85.0	8 80.0	17 81.0	12 100.0	12 50.0	17 89.5	17 77.3	11 78.6	13 86.7	172 78.9
Chance to accomplish	n %	9 60.0	21 67.7	12 80.0	15 75.0	6 60.0	19 90.5	8 66.7	13 54.2	15 79.0	16 72.7	10 71.4	13 86.7	157 72.0
Education and training	n %	4 26.7	12 38.7	8 53.3	7 35.0	3 30.0	9 42.9	8 66.7	7 29.2	8 42.1	8 36.4	5 35.7	7 46.7	86 39.5
Adequate authority	n %	8 53.3	22 71.0	13 86.7	16 80.0	7 70.0	19 90.5	11 91.7	16 66.7	17 89.5	18 81.8	12 85.7	13 86.7	172 78.9
AVERAGE	%	57.5	73.4	71.7	68.8	65.0	83.9	80.2	52.1	84.2	75.0	68.8	79.2	71.6

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	15	31	15	20	10	21	12	24	19	22	14	15	218
Limited resources	n %	12 80.0	13 41.9	13 86.7	15 75.0	6 60.0	10 47.6	8 66.7	15 62.5	15 79.0	9 40.9	9 64.3	9 60.0	134 61.5
Limited time	n %	6 40.0	6 19.4	5 33.3	5 25.0	4 40.0	5 23.8	3 25.0	12 50.0	2 10.5	5 22.7	4 28.6	4 26.7	61 28.0
Not assigned	n %	4 26.7	4 12.9	5 33.3	3 15.0	1 10.0	3 14.3	0 0.0	7 29.2	1 5.3	1 4.6	4 28.6	3 20.0	36 16.5
No sure when to	n	4	6	4	9	2	4	1	9	3	2	4	3	51

do	%	26.7	19.4	26.7	45.0	20.0	19.1	8.3	37.5	15.8	9.1	28.6	20.0	23.4
Did not have skills	n	2	6	4	4	1	2	2	7	4	2	5	2	41
	%	13.3	19.4	26.7	20.0	10.0	9.5	16.7	29.2	21.1	9.1	35.7	13.3	18.8
AVERAGE	%	37.3	22.6	41.3	36.0	28.0	22.9	23.3	41.7	26.3	17.3	37.1	28.0	29.6

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

	N	BBT	DDM	IGN	MSS	MBL	MPP	MLB	MZA	NKS	SWN	TBR	TNR	Total
	15	31	15	20	10	21	12	24	19	22	14	15	218	
Understood what to do	n	8	24	10	15	6	17	11	18	17	17	11	12	166
	%	53.3	77.4	66.7	75.0	60.0	81.0	91.7	75.0	89.5	77.3	78.6	80.0	76.2
Had knowledge & skills	n	10	25	10	17	8	20	11	17	17	17	8	14	174
	%	66.7	80.7	66.7	85.0	80.0	95.2	91.7	70.8	89.5	77.3	57.1	93.3	79.8
Enough resources	n	2	13	2	5	2	12	3	7	4	12	4	6	72
	%	13.3	41.9	13.3	25.0	20.0	57.1	25.0	29.2	21.1	54.6	28.6	40.0	33.0
Knew whom to ask	n	13	27	12	18	10	19	12	19	17	19	12	15	193
	%	86.7	87.1	80.0	90.0	100.0	90.5	100.0	79.2	89.5	86.4	85.7	100.0	88.5
Tried best & figured out	n	12	26	13	18	6	15	10	18	17	16	10	12	173
	%	80.0	83.9	86.7	90.0	60.0	71.4	83.3	75.0	89.5	72.7	71.4	80.0	79.4
AVERAGE	%	60.0	74.2	62.7	73.0	64.0	79.0	78.3	65.8	75.8	73.6	64.3	78.7	71.4

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

	N	BBT	DDM	IGN	MSS	MBL	MPP	MLB	MZA	NKS	SWN	TBR	TNR	Total
	15	31	15	20	10	21	12	24	19	22	14	15	218	
Monitoring not essential (neg)	n	0	1	2	2	3	0	0	4	1	0	1	1	15
	%	0.0	3.2	13.3	10.0	30.0	0.0	0.0	16.7	5.3	0.0	7.1	6.7	6.9
People not data (neg)	n	3	1	2	1	2	0	1	3	1	0	3	1	18
	%	20.0	3.2	13.3	5.0	20.0	0.0	8.3	12.5	5.3	0.0	21.4	6.7	8.3
Collecting data saves lives (pos)	n	14	28	15	19	9	17	12	23	19	20	13	15	204
	%	93.3	90.3	100.0	95.0	90.0	81.0	100.0	95.8	100.0	90.9	92.9	100.0	93.6
Someone else should collect data (neg)	n	5	5	7	5	3	6	5	4	3	4	3	3	53
	%	33.3	16.1	46.7	25.0	30.0	28.6	41.7	16.7	15.8	18.2	21.4	20.0	24.3
Enjoy the skills I use (pos)	n	12	27	11	17	9	20	11	17	14	19	10	13	180
	%	80.0	87.1	73.3	85.0	90.0	95.2	91.7	70.8	73.7	86.4	71.4	86.7	82.6
Tracking disease data important (pos)	n	14	30	15	18	10	21	11	24	18	22	14	15	212
	%	93.3	96.8	100.0	90.0	100.0	100.0	91.7	100.0	94.7	100.0	100.0	100.0	97.3

Greater effort for IDSR (pos)	n	14	31	15	19	10	20	11	23	18	22	14	15	212
	%	93.3	100.0	100.0	95.0	100.0	95.2	91.7	95.8	94.7	100.0	100.0	100.0	97.3
AVG POSITIVE														
	%	90.0	93.5	93.3	91.3	95.0	92.9	93.8	90.6	90.8	94.3	91.1	96.7	92.7
AVG NEGATIVE														
	%	17.8	7.5	24.4	13.3	26.7	9.5	16.7	15.3	8.8	6.1	16.7	11.1	13.2

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	Total
	N	98	63	25	6	26	218
Co-workers	n	85	55	21	4	22	187
	%	86.7	87.3	84.0	66.7	84.6	85.8
Supervisor's support	n	69	48	21	4	20	162
	%	70.4	76.2	84.0	66.7	76.9	74.3
Responsibilities	n	81	48	20	3	20	172
	%	82.7	76.2	80.0	50.0	76.9	78.9
Management of IDSR	n	60	43	21	1	16	141
	%	61.2	68.3	84.0	16.7	61.5	64.7
Opportunity to use abilities	n	82	45	19	4	22	172
	%	83.7	71.4	76.0	66.7	84.6	78.9
Chance to accomplish	n	77	40	18	4	18	157
	%	78.6	63.5	72.0	66.7	69.2	72.0
Education and training	n	43	24	8	2	9	86
	%	43.9	38.1	32.0	33.3	34.6	39.5
Adequate authority	n	84	45	19	3	21	172
	%	85.7	71.4	76.0	50.0	80.8	78.9
AVERAGE	%	74.1	69.0	73.5	52.1	71.2	71.6

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	Total
	N	98	63	25	6	26	218
Limited resources	n	61	38	13	6	16	134
	%	62.2	60.3	52.0	100.0	61.5	61.5
Limited time	n	29	19	7	5	1	61
	%	29.6	30.2	28.0	83.3	3.9	28.0
Not assigned	n	15	14	3	3	1	36
	%	15.3	22.2	12.0	50.0	3.9	16.5
No sure when to do	n	17	21	4	5	4	51
	%	17.4	33.3	16.0	83.3	15.4	23.4

Did not have skills	n	14	16	6	2	3	41
	%	14.3	25.4	24.0	33.3	11.5	18.8
AVERAGE	%	27.8	34.3	26.4	70.0	19.2	29.6

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	Total
	N	98	63	25	6	26	218
Understood what	n	76	46	19	2	23	166
	%	77.6	73.0	76.0	33.3	88.5	76.2
Had knowledge & skills	n	81	47	20	3	23	174
	%	82.7	74.6	80.0	50.0	88.5	79.8
Enough resources	n	33	20	11	0	8	72
	%	33.7	31.8	44.0	0.0	30.8	33.0
Knew whom to ask	n	87	55	25	2	24	193
	%	88.8	87.3	100.0	33.3	92.3	88.5
Tried best & figured out	n	77	50	23	4	19	173
	%	78.6	79.4	92.0	66.7	73.1	79.4
AVERAGE	%	72.2	69.2	78.4	36.7	74.6	71.4

Table 8: General opinion and feedback - by HW type (represents agree and strongly agree responses)

		Clinician	Nurses	Attendant	Lab staff	Health Of	Total
	N	98	63	25	6	26	218
Monitoring not essential (neg)	n	3	9	2	0	1	15
	%	3.1	14.3	8.0	0.0	3.9	6.9
People not data (neg)	n	5	10	2	1	0	18
	%	5.1	15.9	8.0	16.7	0.0	8.3
Collecting data saves lives (pos)	n	91	57	24	6	26	204
	%	92.9	90.5	96.0	100.0	100.0	93.6
Someone else should collect data (neg)	n	23	18	7	3	2	53
	%	23.5	28.6	28.0	50.0	7.7	24.3
Enjoy the skills I use (pos)	n	82	48	22	4	24	180
	%	83.7	76.2	88.0	66.7	92.3	82.6
Tracking disease data important (pos)	n	95	61	25	5	26	212
	%	96.9	96.8	100.0	83.3	100.0	97.3
Greater effort for IDSR (pos)	n	97	59	24	6	26	212
	%	99.0	93.7	96.0	100.0	100.0	97.3
AVG POSITIVE	%	93.1	89.3	95.0	87.5	98.1	92.7
AVG NEGATIVE	%	10.5	19.6	14.7	22.2	3.8	13.2