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EVALUATION

Mid-Term Evaluation of the Integrated Disease Surveillance and Response Project

December 14, 2011

This publication was produced for review by the United States Agency for International Development. It was prepared by Bob Pond, Hammam El Sakka, Joseph Wamala and Luswa Lukwago, Management Systems International.



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ACRONYMS

AFP	Acute Flaccid Paralysis
AJS	Acute Jaundice Syndrome
CDC	Centers for Disease Control and Prevention
CES	Central Equatoria State of South Sudan
CHD	County Health Department
CHF	Common Humanitarian Fund
CHW	Community Health Worker
CO	Clinical Officer
CPA	Comprehensive Peace Agreement
CSO	County Surveillance Officer
DHIS	District Health Information System
ECHO	European Community Humanitarian Office
EES	Eastern Equatoria State of South Sudan
EPI	Expanded Program of Immunizations
EPR	Epidemic Preparedness and Response
EWARN	Early Warning and Response Network
FY	Fiscal Year (for the US government, this is October 1 to September 31)
HF	High-Frequency Radio Waves
HMIS	Health Management Information System
IDSR	Integrated Disease Surveillance and Response Program
IMF	International Monetary Fund
M&E	Monitoring and Evaluation
MA	Medical Assistant
MoH	Ministry of Health
MSI	Management Systems International
NBEG	Northern Bahr el Ghazal State of South Sudan
NGO	Non-Governmental Organization
NPA	Norwegian People's Aid
PEI	Polio Eradication Initiative
PHCC	Primary Health Care Center
PHCU	Primary Health Care Unit
Q1, Q2, Q3, Q4	First, Second, Third, and Fourth Quarters of a Year
RSS	Republic of South Sudan
SHTP I	Sudan Health Transformation Project
SMoH	State Ministry of Health
SOW	Scope of Work
SSO	State Surveillance Officer
TNA	Training Needs Assessment
USAID	United States Agency for International Development
VHF	Viral Hemorrhagic Fever
WBEG	Western Bahr el Ghazal State of South Sudan
WES	Western Equatoria State of South Sudan
WHO	World Health Organization
WHO/AFRO	African Regional Office of the World Health Organization
WHO/EMRO	Eastern Mediterranean Regional Office of the World Health Organization
WHO/HQ	Headquarters Office (in Geneva) of the World Health Organization

EXECUTIVE SUMMARY

Background

The newly independent nation of South Sudan is prone to outbreaks of measles, diarrhea/cholera, hepatitis, meningitis, and a range of tropical diseases largely controlled in other countries. Since 2006, the Ministry of Health (MoH) and partners have sought to develop a system for Integrated Disease Surveillance and Response (IDSR) based upon the IDSR strategy promoted by the Africa Regional Office of the World Health Organization (WHO/AFRO).

Beginning in FY 2009, the United States Agency for International Development (USAID) and European Community Humanitarian Office (ECHO) began to fund the office of WHO in Juba to support the implementation of IDSR in South Sudan. Over the subsequent three years, each of these donors has provided approximately \$1 million each year to finance:

- Training of surveillance staff at state, county, and *payam* (sub-county) levels;
- Training of primary health care staff in the detection and reporting of diseases of epidemic potential;
- Printing and dissemination of job aides and reporting forms;
- Procurement and distribution to surveillance staff of high-frequency radios, satellite telephones, motorcycles, and bicycles;
- Procurement and prepositioning emergency medical supplies, vaccines, and laboratory supplies;
- Operational costs of support supervision, collection of weekly surveillance reports, and investigation of suspected outbreaks; and
- Employment of WHO technical staff (international and national) at state and national levels.

Methodology

This mid-term evaluation report presents the findings, conclusions, and recommendations of a collaborative evaluation commissioned by USAID and conducted September 27 to November 2, 2011 by a team of four external consultants. The evaluation team reviewed all available documentation and data from the IDSR program and interviewed key informants in Juba and in a convenience sample of six states, nine counties, and 38 health facilities. Findings, conclusions, and recommendations were shared and discussed at a final meeting held on October 28 with representatives of the Ministry of Health, the World Health Organization, USAID, ECHO, and other organizations.

Overall progress with IDSR

- From 2009 to 2011, the IDSR program made significant progress with development and dissemination of integrated reporting tools, recruitment of State Surveillance Officers (SSOs) and County Surveillance Officers (CSOs), training of large numbers of primary health care staff, and distribution of communication and transport equipment. As a result, the percentage of health facilities in South Sudan reporting weekly rose considerably during 2010.

Deployment of State and County Surveillance Officers

- Surveillance officers have been deployed to all 10 states and to 71 of 80 counties.
Most State and County Surveillance Officers have received only brief training in disease surveillance and response.

Design and dissemination of IDSR materials

- About half of functional health facilities appear to have received a copy of the case definitions, and about half now have booklets of integrated weekly reporting forms.
- Distribution of booklets of bound weekly reports with “carbonated” copies has assured that copies of these key reports are available for review and validation at facility, county, and state levels.
- Reporting tools and case definitions cannot be read by the large number of health workers who are literate only in Arabic.

Training of primary health workers in disease detection and reporting

- Nationwide, at least 1,500 primary health workers have attended three-day IDSR workshops.
- It is not possible to reliably estimate the percentage of health facilities in South Sudan with at least one health worker trained in IDSR. It is also not possible to estimate the numbers of Community Health Workers (CHWs), nurses, Clinical Officers (COs), and doctors that have attended the workshop. At least one person had attended the IDSR workshop at about half of the health facilities visited by the evaluation team.
- Roughly half of health workers interviewed were able to state appropriate case definitions and correctly specify the diseases that should be reported immediately. Health workers’ IDSR knowledge appeared to relate more to their basic qualifications and pre-service training than to whether they had attended a three-day IDSR workshop.

Routine weekly and monthly reporting of diseases

- During the last 12 months, the percentage of health facilities reporting weekly has held roughly constant at 40 percent to 50 percent nationwide.
- Completeness of weekly reporting has been significantly higher and more consistent in some states than in others.

- A wide variety of mutually incompatible forms are used by health facilities for monthly reporting of diseases. As a result, management and aggregation of monthly data at higher levels is very difficult.
- At state and county levels, monitoring of reporting by health facilities has been quite weak. In fact, there is no system currently in place for monitoring the timeliness of reporting.

Effectiveness of communication and transport equipment supplied by the project

- Informants reported that the motorcycles and bicycles supplied by the project had helped with reporting and supervision of IDSR activities. However, less than half of states and counties reported that they used the Codan high-frequency (HF) radios and Thuraya satellite telephones to assist with weekly reporting. In fact, significant numbers of SSOs and CSOs reported that they were not using these radios and satellite phones at all.
- For most counties visited by the evaluation team, mobile phones are now used more frequently to support surveillance activities than HF radios and satellite phones.

Detection and investigation of suspected outbreaks

- Neither CSOs nor SSOs are required to routinely produce any reports of their own. As a result, most State and County Surveillance Officers do not adequately review the weekly IDSR data, and possible outbreaks or errors in the data go undetected. The evaluation team found no evidence of analysis of data (e.g., graphs or data tables) at any of the county health departments it visited.
- Contrary to national IDSR guidelines, staff at facility, county, and state levels complete very few case investigation forms and line listings. This severely limits the information available for investigation of suspected outbreaks.
- WHO has sought to reinforce the capacity of SSOs and CSOs by encouraging WHO staff at the state level to support IDSR activities, including the investigation of suspected outbreaks. The absence or incompleteness of key documentation (e.g., outbreak logs, case investigation reports) at most state and county surveillance offices suggests that, with few exceptions, it is these WHO staff and not the State and County Surveillance Officers who have been active with outbreak investigations.
- The outbreak logs currently in use at state and national levels do not explicitly record the date of (first) notification or the date that any laboratory specimen was collected. As a result, the outbreak logs do not provide a reliable way of assessing the timeliness of investigations.

Laboratory confirmation of outbreaks

- There is no laboratory in South Sudan that can confirm the most important diseases of epidemic potential. To confirm outbreaks, laboratory specimens must be sent to Nairobi.
- During the first eight months of 2011, the average delay between the collection of a specimen and the return of the result to Juba was 22 days. Such a delay is not compatible with timely detection and correct response to outbreaks.
- Several states complained of months-long delays in receipt of lab results from Juba. According to WHO staff responsible for sending such feedback, this delay is partly due to a failure to rigorously implement a system for labeling each case report and each laboratory specimen with a unique identifier.

IDSR data management

- Weekly IDSR data are entered and managed at state and national levels using MS Excel spreadsheets. This complicates data entry, contributes to errors in the transcription of data and errors in spreadsheet formulae, and limits the reports that can be automatically generated.
- The Monitoring and Evaluation (M&E) Division of the MoH is working with external consultants to roll out District Health Information System (DHIS) software in all 10 states and at the national level. Most SSOs and national IDSR staff have received basic training in the use of this database software, and current plans call for the routine weekly IDSR data to soon be entered into and managed with it.
- As currently configured for South Sudan, DHIS cannot manage case-based data or line listings.

Integration of disease surveillance

- Progress has been achieved with the adoption of an integrated system for weekly reporting of multiple diseases.
- IDSR training workshops and the Annual IDSR Review Meetings have incorporated sessions to promote integration of disease surveillance.
- Experience with the Guinea Worm Eradication Program serves as an encouraging example of how a “vertical” disease-control initiative can contribute funding to pay for some IDSR field expenses.
- The persistence, and even expansion, of a parallel system for reporting of acute flaccid paralysis (AFP) (and now measles and neonatal tetanus) has coincided with a reduction in the reporting of vaccine-preventable infections on weekly reports. This could undermine confidence in the weekly reporting system. This finding demonstrates that the considerable resources at the disposal of the polio eradication program have yet to be adequately mobilized in support of IDSR.

Sustainability and capacity building

- The government of South Sudan has demonstrated its commitment to IDSR by regularly paying the salaries of most State and County Surveillance Officers.
- The WHO funds the salaries of International Focal Points and National Focal Points in most states. In addition, it has paid for fuel, communication expenses, transport allowances, and salary top-ups for SSOs and select CSOs. Such funding has been essential to the progress so far achieved with weekly reporting.
- The Epidemic Preparedness and Response (EPR) Division, the unit within the MoH responsible for IDSR, has only three staff.
- The EPR Task Force has not met for more than three months.
- According to several key informants, the best way to strengthen implementation of IDSR is to build the surveillance capacities of State Ministries of Health and County Health Departments. WHO staff at the state level, including those supporting polio eradication, are key to building such decentralized capacity.

Key Recommendations¹

- To build upon the progress achieved to date, WHO staff need to focus on strengthening the performance of State and County Surveillance Officers. This will require:
 - Improved systems for SSOs and CSOs to monitor and supervise weekly reporting;
 - Improved SSO and CSO review of surveillance data and investigation of suspected outbreaks; and
 - Monthly reporting by SSOs and CSOs of key findings and work performed.

If WHO and its donors monitor and hold WHO staff at the state level (including those staff now focused on polio eradication) accountable for such efforts to build the capacity of SSOs and CSOs, it should be possible to achieve considerable progress with completeness and timeliness of reporting within 12 months. In the longer term, advanced training of SSOs and CSOs will enhance their capacity for analysis of the data.

- The range of IDSR components in need of revision (e.g., systems for monitoring reporting, for investigation of suspected outbreaks, for tracking and feeding back case-based information, for compiling data from training) suggests that the WHO office would benefit from technical support. USAID and/or ECHO should collaborate with the WHO office to recruit a highly experienced short-term consultant to help redesign key systems. The same consultant should help pilot the approach described in the previous recommendation for WHO staff to strengthen the performance of State and County Surveillance Officers.
- To provide for effective national leadership of disease surveillance and response, the Ministry of Health needs to reactivate the EPR Task Force and allocate to the EPR Division the staff (i.e., two Deputies in addition to the Director and the Inspector) that are essential for its functioning. If necessary, and if it is agreeable to MoH officials, donor partners might assist with the financing and recruitment for these positions.
- The Ministry of Health, WHO, and donor partners should rigorously monitor an expanded set of indicators. These indicators should track efforts to build capacity at state and county levels and assess the extent to which the IDSR system reliably detects suspected outbreaks and responds to them in a timely manner.
- USAID, ECHO, and WHO should participate in efforts by the MoH to develop an officially endorsed strategic plan for IDSR.

¹ The full list of recommendations is provided in the Recommendations section of this report.

INTRODUCTION AND BACKGROUND

South Sudan and Its Health System

The Republic of South Sudan (RSS) became an independent nation in July of 2011, following six years of autonomy within the Republic of Sudan. Prior to that, half a century of prolonged civil wars left southern Sudan one of the least developed regions in the world.² Since the Comprehensive Peace Agreement (CPA) and the establishment of the Ministry of Health (MoH) in 2005, the Republic of South Sudan, with the support of its development partners, has begun to establish a national health system.

A census in 2008 enumerated 8.3 million people living in 10 states within a total of 80 counties (see Figure 1). South Sudan's population is estimated to have increased to more than 12 million since that census was completed, due mostly to the return of refugees from neighboring countries and displaced populations from northern Sudan.

South Sudan has some of the most challenging development characteristics in the world.³ Fifty-one percent of the population lives on less than one dollar per day.⁴ Only 40 percent of the nation's men and 16 percent of its women are literate.⁵ Eighty-three percent of the population resides in tukuls in scattered rural settlements.⁶ Forty-five percent of the population has no access to improved sources of drinking water, 38 percent have to walk for more than 30 minutes to collect drinking water, and 80 percent do not have access to a toilet.⁷ With an area nearly as large as France, South Sudan had only 100 kilometers of paved roads at the time of independence.⁸



² Armed conflict began around the time that Sudan became independent in 1955 and lasted until peace was negotiated in 1972. Civil war resumed in 1983 and continued until the Comprehensive Peace Agreement (CPA) was signed in 2005. The CPA provided for six years of an autonomous southern Sudan within Sudan, followed in 2011 by a national referendum to establish independence. For a review of recent history, see *A History of Modern Sudan* by Robert O. Collins (Cambridge University Press: 2008, 302 pages).

³ For example, see “High-level scary statistics” on the website of United Nations Sudan Information Gateway.
http://www.unsudanig.org/new_gateway/

⁴ National Baseline Household Survey of 2010, as cited by the Southern Sudan Centre for Census, Statistics and Evaluation. Key Indicators for Southern Sudan, 2011.

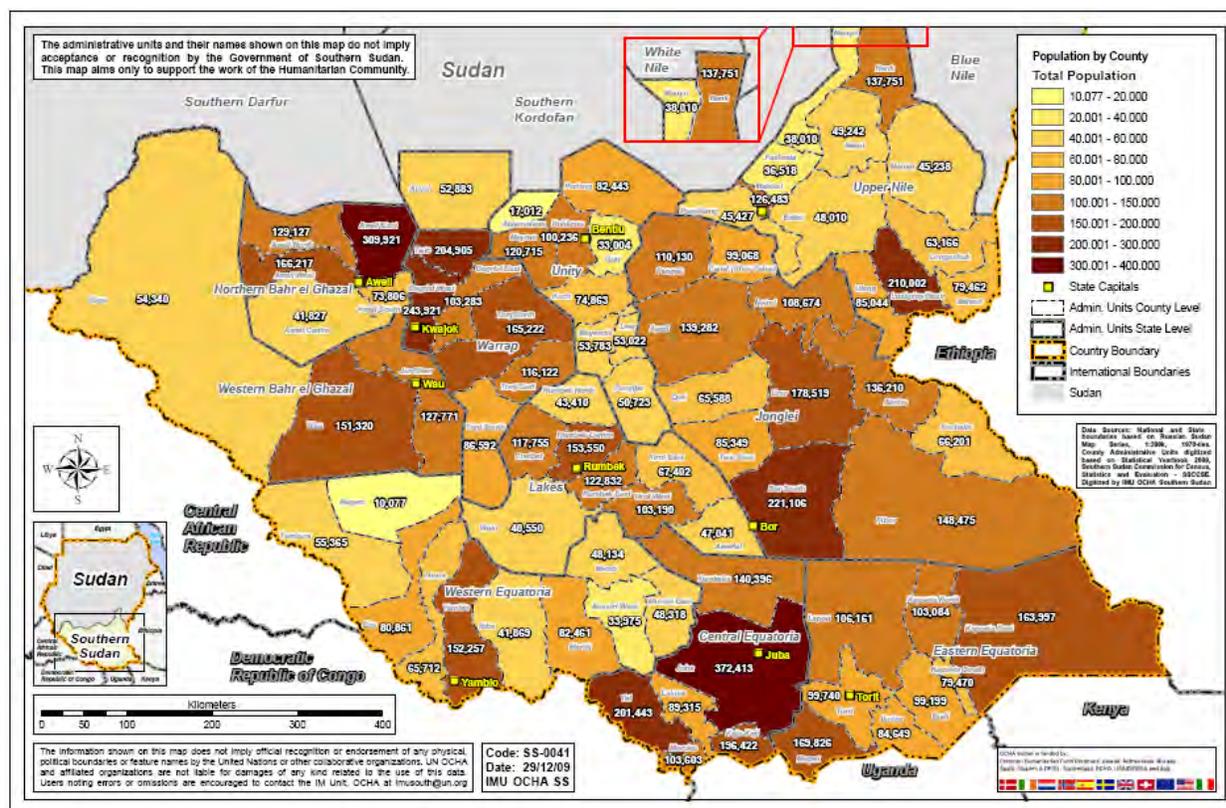
⁵ *National Educational Statistical Booklet, EMIS, Ministry of Education (2009)*, as cited by the Southern Sudan Centre for Census, Statistics and Evaluation. Key Indicators for Southern Sudan, 2011; in contrast, 72 percent of all adults in sub-Saharan Africa are literate according to the World Development Indicators of the International Monetary Fund.

⁶ 5th Population and Housing Census of 2008, as cited by the Southern Sudan Centre for Census, Statistics and Evaluation. Key Indicators for Southern Sudan, 2011; Tukuls are mud huts with conical or pyramidal thatched roofs.

⁷ National Baseline Household Survey of 2009 as cited by the Southern Sudan Centre for Census, Statistics and Evaluation. Key Indicators for Southern Sudan, 2011.

⁸ International Monetary Fund, July 18, 2011: <http://www.imf.org/external/pubs/ft/survey/so/2011/car071811a.htm>.

Figure 1: Population by county of South Sudan, from the 2008 census



The DRAFT Health Strategic Plan notes that “the civil war practically destroyed the whole infrastructure and social fabric of Southern Sudan. . . .”⁹ There are now about 1000 health facilities in the country, including about 40 hospitals, 270 Primary Health Care Centers (PHCCs), and 800 Primary Health Care Units (PHCUs). Health facility mapping exercises conducted by the Ministry of Health since 2009 have shown that, depending upon the state, the percentage of settlements within 5 kilometers and 10 kilometers of a functioning health facility is between 39–51 percent and 61–75 percent, respectively.¹⁰

The DRAFT Health Strategic Plan also notes that:

“The capacity of the health facilities to provide good quality and full range of child health and other basic health services is very limited due to gross understaffing and/or lack of qualified health workers and basic equipment in the health facilities. The majority of the staff running the facilities are CHWs [Community Health Workers] who have very limited technical skills but [are] also poorly or not supervised at all. . . . In view of the limited access to health care, Southern Sudan has increasingly utilized community-level approaches such as mass campaigns to rapidly scale up preventive interventions. . . .”¹¹



⁹ Health Strategic Plan (2011–2015), Government of Southern Sudan, Ministry of Health, Draft 1, September 2010.

¹⁰ Maps can be downloaded from <http://www.unsudanig.org/library/mapcatalogue/south/index.php?fid=health&nutrition>.

¹¹ Health Strategic Plan (2011–2015), Government of Southern Sudan, Ministry of Health, Draft 1, September 2010.

This data is echoed in the Basic Package of Health and Nutrition Services for Southern Sudan, which notes that health facility user rates are estimated to be as low as 0.2 contacts per person per year, only 23 percent of expectant mothers receive antenatal care, and “most immunization services are still provided by mobile teams at outreach posts.”¹² This has major implications for the representativeness and timeliness of reporting of disease outbreaks based upon facility-based surveillance.

Recurrent humanitarian and health emergencies

Even after independence, humanitarian emergencies continue in the country as a result of border disputes between the Republic of Sudan and the Republic of South Sudan, civil conflict within South Sudan, floods, and recurrent drought. These conditions are exacerbated by recurrent disease. In addition to common illnesses, including measles, acute watery diarrhea, hepatitis, cholera, and meningitis, a range of rare tropical diseases largely controlled in other countries remain endemic in South Sudan and account for a considerable proportion of the total burden of diseases.¹³ The risk of epidemic disease was summed up well by the July 2011 Early Warning and Response Network (EWARN) assessment report of the World Health Organization Headquarters Office (WHO/HQ) and Eastern Mediterranean Regional Office (WHO/EMRO):¹⁴

“Since 2000, detected outbreaks include cholera, viral haemorrhagic fever (Ebola, Marburg), meningococcal meningitis . . . , measles, yellow fever, Rift Valley fever, and hepatitis E. New and emerging diseases include H1N1. . . . Dracunculiasis (Guinea-worm disease), human African trypanosomiasis (sleeping sickness), lymphatic filariasis, and so-called ‘nodding disease’ (a possibly infectious causative agent has not yet been identified) are endemic in some areas. The greater Upper Nile region is experiencing an ongoing outbreak of visceral leishmaniasis (kala azar) with more than 1000 new cases per year reported. . . . although malaria (predominantly Plasmodium falciparum) transmission is intense and year round in most of South Sudan, localised outbreaks can occur in some areas related to climatic factors or influxes of populations from areas of lower transmission intensity. . . . Urban centres are considered particularly at risk of cholera (no confirmations, 2010; 13,681 cases, 60 deaths in 12 counties, 2009). In addition, ongoing population movements and insecurity complicate disease transmission and response dynamics. . . . Transmission risks are compounded by low vaccination coverage (less than 2% of children are fully immunised by 12 months of age) and poor coverage of improved water (68%) and sanitation (15%). Susceptibility to severe disease is increased by high levels of malnutrition (30% of children under five years of age are underweight).”

Efforts to strengthen disease surveillance

In 1999, the WHO established an EWARN to facilitate rapid reporting and investigation of suspected outbreaks by a network of NGO-operated health facilities operating in southern Sudan. The EWARN partners operated up to 40 high-frequency (HF) radios at key locations to permit communication between field and national staff. EWARN trained at least 387 primary health workers, some lab technicians, and 700 community-level volunteers.¹⁵ Weekly reporting was launched at a dozen sentinel sites.

¹² Basic Package of Health and Nutrition Services for Southern Sudan, Ministry of Health, 2009.

¹³ The WHO South Sudan Office, Quarterly Report, April to June 2011 noted that “the concentrations of the population [of refugees and internally displaced persons] in transit points compounded the already dire state of poor sanitation and lack of safe drinking water and sanitation facilities in the settlement area, predisposing returnees to outbreaks of water-borne diseases”; The most recent declared outbreaks of cholera and meningitis were in 2007.

¹⁴ Dr Martin Opoka (WHO/EMRO), Dr Peter Mala (WHO/HQ), and Dr Nadine Ezard (independent consultant). “Strengthening early detection of communicable disease outbreaks in the Integrated Disease Surveillance and Response system in South.” WHO/EMRO, June 20–30, 2011.

¹⁵ This account is extracted from the document entitled “The Implementation of Integrated Disease Surveillance and Response in the African and Eastern Mediterranean Regions: Synthesis Report,” published in 2003 by WHO, CDC, USAID, Support for Research and Analysis in Africa and United Nations Fund for International Partnerships; At the WHO EWARN base at Lockichoggio, Kenya, the network was supported by an

Even after the signing of the Comprehensive Peace Agreement in 2005, there was no laboratory in southern Sudan capable of confirming diseases of epidemic potential, so the MoH of the southern Sudan government relied upon laboratory services provided by the Centers for Disease Control and Prevention (CDC), the Kenya Medical Research Institute, and the African Medical and Research Foundation in Kenya.

In October 2006, a consultant was recruited by WHO to assess surveillance systems in southern Sudan.¹⁶ This assessment noted that, at that time, there was no structure within the national MoH for epidemic preparedness and response. Also, there were multiple reporting formats in use for disease surveillance. With the encouragement of WHO, the MoH organized an Integrated Disease Surveillance and Response (IDSR) Task Force that endorsed case definitions for a small set of priority diseases based upon the generic IDSR selection of the World Health Organization African Regional Office (WHO/AFRO).¹⁷

Integrated Disease Surveillance and Response is a strategy of WHO/AFRO adopted by member states in 1998. The IDSR strategy aims to improve the availability and use of surveillance data for control of priority infectious diseases. It supports the strengthening of key capacities and practices:

- Health facility staff to detect and promptly report select diseases of epidemic potential;
- District (or county, in the case of South Sudan) and higher-level health workers to investigate and confirm (with laboratory testing) suspected outbreaks of these diseases;
- Health staff at all levels to analyze surveillance data to recognize outbreaks and understand disease trends, geographic distribution, and variation between sub-populations;
- Health staff at all levels to promptly respond to confirmed disease outbreaks (e.g., with supplemental vaccination for measles) and to prepare for possible future outbreaks (e.g., through prepositioning of drugs and the development of contingency plans);
- Higher-level health staff to provide timely feedback of surveillance findings to field staff.

The United States Agency for International Development (USAID) began to support disease surveillance activities in southern Sudan in 2005 with funding through the CDC as a component of the Sudan Health Transformation Project (SHTP I). The project supported long-term graduate training in the Field Epidemiology and Laboratory Training Program in Kenya. “Through this project, only eight public health master’s degree holders were trained, but the community-based surveillance network was not developed.”¹⁸ Meanwhile, the European Community Humanitarian Office (ECHO) and the Sudan Common Humanitarian Fund (CHF) continued to fund EWARN activities at state and county levels.

epidemiologist, three public health coordinators, an administrative assistant, a radio operator, two logistic support personnel, and a driver. Funding initially came from the UNFIP project. After UNFIP ended, EWARN accessed other human, material, and financial resources from other programs functioning in southern Sudan such as Polio, UNICEF/Operation Lifeline Sudan, and NGOs.

¹⁶ Senait Kebede, 2006. Assessment of National Communicable Disease Surveillance Systems In South Sudan.

¹⁷ The weekly surveillance form is now used for reporting all cases of suspected cholera, acute watery diarrhea, bloody diarrhea, suspected measles, suspected meningitis, suspected viral hemorrhagic fever, acute jaundice syndrome, suspected H5N1 (avian) influenza, suspected H1N1 (swine) influenza, malaria, neonatal tetanus, and drancunculiasis (guinea worm).

¹⁸ Scope of Work for the Mid-term Program Evaluation of Integrated Disease Surveillance and Response (IDSR) Project, implemented by the World Health Organization. USAID. September 2011; Master’s degrees were awarded in Applied Epidemiology.

“In 2008, USAID changed the implementing partner and funded WHO to implement IDSR in all southern Sudan counties.”¹⁹ The same year, ECHO also began to finance WHO support for IDSR.

As detailed in Annex 2, from 2008 to 2011, ECHO financing for IDSR has been roughly equivalent to that of USAID. Two-thirds of ECHO financing has paid for the salaries of field epidemiologists, a logistics officer, and other WHO staff.

USAID allocated \$800,000 in 2008–2009, \$1,100,000 in 2009–2010, and \$1,356,000 in 2010–2011 to pay for six principal components of the IDSR program:



1. Brief in-service training in IDSR for health facility staff, laboratory technicians, *payam* (sub-county) surveillance focal points, County Surveillance Officers (CSOs), and State Surveillance Officers (SSOs);
2. Printing and dissemination of reporting forms and job aides;
3. Procurement and distribution of high-frequency (“Codan”) radios and satellite (“Thuraya”) telephones to facilitate reporting by remote counties;
4. Procurement and distribution of motorcycles and bicycles for *payam* and county levels;
5. Salary of one epidemiologist and four national public health officers employed by WHO; and
6. A small amount of funding to support supervision visits, collection of reports, outbreak investigations, coordination meetings, and prepositioning of emergency medical and laboratory supplies.²⁰

An evaluation of the IDSR program of southern Sudan was carried out in May 2009 under the auspices of the government of southern Sudan and WHO.²¹ Some key findings were that less than 10 percent of health facilities had copies of standard case definitions; integrated reporting forms had not yet been distributed; only 18 percent of in-charges were trained in IDSR; and facilities only reported when there was an epidemic-prone disease to notify.

Following this 2009 evaluation, an IDSR Action Plan was prepared for 2009–2013.²² This proposed five-year Action Plan stipulated that “a mid-term review of the implementation of the IDSR Plan of Action will be undertaken at the end of three years. This will be undertaken internally with technical assistance from outside the Ministry of Health.” The IDSR program has not been evaluated since 2009, although a team from

¹⁹ Scope of Work for the Mid-term Program Evaluation of Integrated Disease Surveillance and Response (IDSR) Project, implemented by the World Health Organization. USAID. September 2011.

²⁰ \$30,000 to \$40,000 per year was included in each annual USAID budget to support these field costs.

²¹ Report: Evaluation for Integrated Disease Surveillance and Response in Southern Sudan, May 2009. Ministry of Health of South Sudan in collaboration with WHO and other partners.

²² *Proposed Integrated Disease Surveillance and Response Action Plan*, 2009. Ministry of Health, Government of Southern Sudan, in collaboration with WHO and Other Development Agencies; The status of this proposed five-year action plan is unclear. The FY 2010 annual report notes that, during its second year, the project “finalized and disseminated IDSR strategy framework and action plans to all SMoHs [State Ministries of Health] and health partners.” The M&E plan of this five-year IDSR Action Plan is included as Annex 5 of this report.

WHO/EMRO and WHO/HQ visited South Sudan for 10 days in June 2011 to review IDSR/EWARN activities.

METHODOLOGY AND DATA LIMITATIONS

The scope of work (SOW) for the collaborative mid-term evaluation is included as Annex 1. The overall purpose of the evaluation was to determine how effective the WHO has been in implementing the IDSR project and to recommend programmatic shifts, if necessary, to more effectively achieve the project's aims. Specifically, the evaluation team was asked to:

1. Assess whether an IDSR system at the state and county levels has been established and is working;
2. Assess the effectiveness of the IDSR system in terms of regular and timely reporting of suspected outbreaks and prompt response at state and county levels;
3. Assess the extent and effectiveness of integration of vertical disease surveillance activities (such as for guinea worm, polio, onchocerciasis, etc.) at state and county levels;
4. Assess to what extent capacity is being built among MoH staff at the various levels of the system, such that the program will continue once the project ends; and
5. Assess the usefulness of the transport and communication equipment provided to the state and county surveillance offices.

The SOW further specified that the evaluation should provide “. . . recommendations for improving impact during the life of the project and any key issues USAID should consider in looking beyond the life of the project.”

The SOW asked the evaluation team to address 24 questions, grouped under five topics, and 10 numbered questions, as shown in Table 1.²³

Table 1: Topics and questions specified by the Scope of Work

Topic	Question number	Evaluation questions
Effectiveness of overall project	1	Are the project's core activities being implemented as planned?
		Have State and County Surveillance Officers been recruited and deployed as planned?

²³ The first four topics and the first eight numbered questions of the SOW specify the scope of evaluation findings and are addressed in detail in the Findings section of this report. The second numbered question (regarding major overall shortcomings of the project), third numbered question (regarding the impressions that various stakeholders have of the program) and sixth numbered question (whether IDSR data are used for decision-making) are addressed last in the Findings section. The ninth numbered question of the SOW, regarding critical lessons learned, is addressed in the Conclusions section of this report, and the tenth numbered question, regarding future directions, is addressed in the Recommendations section of this report.

Topic	Question number	Evaluation questions
		Have IDSR materials (guidelines, data collection tools, case definitions, etc.) been developed and disseminated to health centers and units effectively?
		Has training of primary health care workers on epidemic preparedness and response been effective? Are trainees using the IDSR materials?
	2	What, if any, are major overall shortcomings that should be addressed for effective project implementation?
	3	What are MoH, other donor, and stakeholder impressions of the program?
Timely reporting and response	4	Are IDSR data accurately recorded and reported on a timely basis to higher levels within the system?
		Of those whose staff have been trained, which, and how many, health facilities and counties are submitting IDSR reports?
		How many submit regularly on a weekly and monthly basis?
		Have the communication and transportation equipment provided at the State and County level improved accurate and timely reporting? Is equipment being used effectively and appropriately?
	5	When outbreaks and epidemic alerts are reported, are they responded to promptly and effectively?
		To what extent are States and Counties prepared to respond to outbreaks vis-à-vis prepositioning of drugs, reagents, vaccines, personal protective equipment, and materials?
6	Are IDSR data used for decision-making? If so, how?	
Integration	7	How have/are other disease surveillance programs being integrated into IDSR?
		Are there regular coordination meetings at different levels of the system?
		Do IDSR trainings include strategies and approaches (including tools) for integrating various disease surveillance activities?
Capacity building	8	What key strategies is WHO using to build the necessary institutional capacity within the Ministry of Health to manage and run the disease surveillance and response program once the project ends?
		Is there apparent and effective leadership from the MoH at the National, State, and County levels on the IDSR program? What evidence is there that the MoH 'owns' the program?

Topic	Question number	Evaluation questions
		To what extent is WHO investing in recurrent costs (e.g., salaries/stipends) that will be difficult for the Ministry of Health to assume once the project ends?
Future directions	9	What are critical lessons learned from the program experience to date?
	10	Is the current approach a sound approach to continue with?
		If not, what adjustments to the current program may be necessary?
		What key issues should USAID consider for the final year of the project?
		What key issues should USAID consider looking beyond the life of the project?

The collaborative evaluation team consisted of two consultants recruited by USAID and two consultants recruited by WHO.²⁴ The team began by reviewing the available documentation of IDSR activities and the adapted IDSR technical guidelines, training materials, and reporting forms.²⁵ It then drafted and field-tested questionnaires for national, state, county, and facility levels (see Annex 3).



The choice of sites for field visits was significantly limited due to the physical inaccessibility of many

²⁴ The consultants recruited by USAID were Robert Pond and Hammam El Sakka, and the WHO-recruited consultants were Luswa Lukwago and Joseph Francis Wamala. Robert Pond served as team leader. He is a public health physician with training in field epidemiology from CDC. He has lived and worked in Africa for 12 years on behalf of USAID/CDC and several non-governmental organizations. More recently, he was a member of the secretariat of the Health Metrics Network at WHO/HQ; Hammam El Sakka is a senior medical epidemiologist and an expert in applied epidemiology (Field Epidemiology Training Program graduate) with more than 14 years of international experience in Africa, Asia, the Middle East, and the United States. He has worked for various international organizations, including US Naval Medical Research Center No. 3, CDC, and WHO. Dr. El Sakka helped to establish disease surveillance and early warning systems in many countries in emergency and humanitarian settings, including Somalia, Lebanon, Syria, Pakistan, Sudan, Iran, Yemen, and Iraq; Luswa Lukwago works as an epidemiologist working with Ministry of Health and teaches at Makerere University School of Public Health in the department of Epidemiology and Biostatistics. He is a principal investigator on the longitudinal research project on the effects of climatic changes on cholera epidemics in Uganda, a lead investigator on the community-based surveillance project in selected districts of Uganda, and a co-investigator on the Highly Pathogenic Influenza sentinel surveillance research project in Uganda; Joseph Francis Wamala is a Senior Epidemiologist at the Uganda Ministry of Health headquarters in Kampala. Dr. Wamala is a member of the National and WHO/AFRO virtual rapid response team and has investigated outbreaks of Ebola, Marburg, Yellow Fever, Anthrax, and cholera both in Uganda and as part of international missions to several African countries like South Africa. Dr. Wamala is also a WHO/AFRO consultant for conducting National International Health Regulations core capacity assessments.

²⁵ Documents reviewed include reports of the 2006 and 2009 evaluations, WHO's annual workplans and budgets for USAID funding, WHO quarterly and annual project reports, presentations from the 2009 and 2011 annual national IDSR reviews, training reports and lists of participants, weekly epidemiological bulletins.

parts of the country as well as to security concerns.²⁶ During its field visits, the team was told by State and County Surveillance Officers that these same constraints had also limited the implementation of IDSR activities. Hence, evaluation findings are likely to reflect the “best case”—the condition of those counties and health facilities that are most accessible to state and county headquarters and which have benefited from the most intensive support. Nonetheless, the evaluation team made a concerted effort to include in their sample the most inaccessible sites that they could possibly reach and return from (see the photos included as Annex 4).

The evaluation team was thus able to visit a convenience sample of six states, nine counties, and 38 health facilities, including seven hospitals, 16 Primary Health Care Centers, and 15 Primary Health Care Units.²⁷



At the state level, staff of the state surveillance office (State Surveillance Officer and data entry clerk if available) were interviewed as well as the resident technical staff of WHO (i.e., International Focal Point, National Focal Point). At the county level, the County Surveillance Officer (and the County Medical Officer if available) was interviewed. At facility level, the evaluation team sought out and interviewed one clinical professional who had been trained in IDSR. If there was no one at the health facility trained in IDSR, then the evaluators interviewed the person responsible for completing the weekly IDSR reporting forms. Evaluators posed questions and reviewed the available documentation to complete the relevant questionnaire at each site. Interviews lasted 45 to 90 minutes per site.



Among the documentation made available to the evaluation team was the complete national data set of weekly IDSR reports for weeks 1 to 35 of 2011, the national log of suspected outbreaks, the logs of specimens sent to laboratories in Nairobi, and the files of training reports. These were each reviewed and analyzed by the evaluation team.

In addition to restrictions on access to field sites, the evaluation team was unable to speak with several key

²⁶ The evaluation took place during the final month of the year’s rainy season and a large percentage of the country’s unpaved roads would not permit passage of vehicles. The team members used United Nations Humanitarian Assistance Service/World Food Program flights to reach remote state capitals but then were restricted to visiting counties and health facilities that were within 20 to 60 miles of the state capital.

²⁷ The states visited include Central Equatoria State (CES), Eastern Equatoria State (EES), Jonglei State, Western Bahr El Ghazal State (WBEG), Warrap State, and Upper Nile State; the counties visited include Yei and Morobo counties of CES, Torit county of EES, Bor county of Jonglei, Wau and Jur River counties of WBEG, Gogrial West and Twic counties of Warrap, and Malakal county of Upper Nile State; South Sudan has roughly 300 PHCCs. According to the Basic Package of Health and Nutrition Services (DRAFT of 2011), these facilities constitute the first referral level and are designed to serve a catchment population of about 50,000 persons with a rudimentary laboratory, maternity beds, and a staff including a Clinical Officer, three nurse/midwives, three Community Health Workers, one lab assistant, one pharmacy technician, and one public health technician; South Sudan has roughly 800 PHCUs. According to the Basic Package of Health and Nutrition Services (DRAFT of 2011), these frontline facilities are designed to serve a catchment population of about 15,000 persons with a staff including two Community Health Workers and a community midwife.

officials.²⁸ Another significant limitation of the evaluation was the incompleteness or absence of some key project documents, including logs of suspected outbreaks at state and county levels, detailed descriptions of training methods, training reports, logs for monitoring timeliness of weekly IDSR reports, and documentation of the medical supplies pre-positioned at various sites.²⁹

FINDINGS

I. Effectiveness of the overall project—Part I

A limited set of output, outcome, and impact indicators have been used to date to monitor the effectiveness of the IDSR program. Project reports document the monitoring of the inputs, processes, and outputs (e.g., numbers of personnel trained) funded by USAID. They also report on the completeness of weekly reporting by health facilities and the timeliness of select outbreak investigations, and attempt to assess the timeliness of laboratory confirmation.³⁰ Quarterly and annual reports of the project described a few public health actions that had been informed by findings of the IDSR system (see the Section IV). These constitute the most important outcomes of the project.

The *Proposed Integrated Disease Surveillance and Response Action Plan for South Sudan for 2009 to 2013* suggests that Monitoring and Evaluation (M&E) of IDSR should focus on the 11 core IDSR indicators put forth by WHO/AFRO and the CDC. However, few, if any of these core IDSR indicators appear to have been monitored.³¹ For details on WHO/AFRO's proposed core IDSR indicators, refer to the M&E plan of the proposed five-year IDSR Action Plan, included as Annex 5 of this report.

I. Are the project's core activities being implemented as planned?³²

Key finding:

- From 2009 to 2011, the IDSR project made significant progress with development and dissemination of integrated reporting tools, recruitment of State Surveillance Officers and County Surveillance Officers, training of large numbers of primary health care staff, and distribution of communication and transport equipment. As a result, the percentage of health facilities in South Sudan reporting weekly rose considerably during 2010.

²⁸ Interviews could not be scheduled with either the Director General of Community and Public Health (who was outside of the country until the final week of the evaluation) or a representative of the Guinea Worm Eradication Program. However, both of these officials attended the October 28 debriefing on the evaluation.

²⁹ As noted below, documentation could not be located for the IDSR training that took place between January and November 2010. The available training reports provided little, if any, information about training coverage—e.g., the number of health facilities covered.

³⁰ For example, the quarterly and annual performance reports and the presentations from the 2011 annual IDSR review meeting; Some quarterly and annual reports note the timeliness of investigations of select outbreaks that have been recorded in the national outbreak log; As discussed in response to question 4 the findings from analysis of the data in the national database of laboratory specimens sent to Nairobi differ markedly from those noted in various quarterly reports.

³¹ As discussed in response to question 5 (on timeliness of reporting), the IDSR Program has monitored the completeness, but not the timeliness, of weekly reporting (see also the previous footnote). As previously noted, the *Proposed Integrated Disease Surveillance and Response Action Plan for South Sudan for 2009 to 2013* was never officially endorsed by the Ministry of Health. Another reason that some of WHO/AFRO's core IDSR indicators were not monitored is that they were too difficult to measure. Experience from other countries in the region suggests that several of these indicators have proven to be quite difficult to track. Hence, an adapted set of core indicators appears to be needed.

³² Question number 1 of the Scope of Work.

Findings related to efforts to strengthen communications, transport, and outbreak investigation are discussed in the appropriate sections of this report (see sections II and III of the Findings).

Have State and County Surveillance Officers been recruited and deployed as planned?

Key findings:

- Surveillance officers have been deployed to all 10 states and to 71 of 80 counties.
- Most State and County Surveillance Officers have received only brief training in disease surveillance and response.

As of May 2009, 57 percent (8/14) of counties surveyed had surveillance officers and 71 percent (10/14) of counties had at least one person trained in IDSR. By the end of fiscal year 2011, WHO proposed to deploy surveillance officers in all counties of South Sudan.³³ WHO documents report that State Surveillance Officers have been recruited and deployed for all 10 states, and County Surveillance Officers have been recruited and deployed for 71 of 80 counties.³⁴

Figure 2, from the IDSR Review Meeting in June 2011, portrays the rollout between 2009 and 2011 of this deployment and other IDSR activities, including distribution of IDSR materials, IDSR training of health facility staff, and distribution of IDSR communication and transport equipment.

³³ Scope of Work for Expansion of IDSR in Southern Sudan, FY 2010 (October 1, 2010 to September 30, 2011). Note the confusing practice of referring to this period as “FY 2010.” It appears that USAID/South Sudan has adopted this practice because it is using funding allocated in FY 2010 to finance activities in FY 2011.

³⁴ SSO figures are derived from the WHO document entitled “IDSR Coverage and Support Staff” reports as of May of 2011; CSO figures are derived from the WHO document entitled “IDSR Supply and Training Status” reports as of September of 2011.

The evaluation team visited six states and nine counties and found that State and County Surveillance Officers were in place at all of these sites.³⁵ They were all receiving their salary regularly from the government of the Republic of South Sudan. In addition, WHO is paying monthly “supervision allowances” to all the State Surveillance Officers and some County Surveillance Officers in Jonglei and Eastern Equatoria States.³⁶

The basic qualifications and in-service IDSR training of surveillance officers varied. In four of the six states visited by the evaluation team, the State Surveillance Officers had a bachelor’s degree or a diploma in health sciences. Four of the nine (44 percent) County Surveillance Officers interviewed had a bachelor’s degree or a diploma in health sciences, while the rest had just a basic secondary school degree. In-service IDSR training of these surveillance officers is summarized in Table 2 below.

Table 2: State and county surveillance officers and health facility staff receiving IDSR in-service training, as a percentage of those who were interviewed by the evaluation team

Type of training/location	State (n=6)		County (n=9)		Health facility (n=38)	
	#	%	#	%	#	%
Basic IDSR training	6	100%	8	89%	21	55%
Additional IDSR training	6	100%	7	78%	0%	0%

Only one of the nine CSOs interviewed by the evaluation team had not received any IDSR in-service training. Only this CSO and one other CSO were unfamiliar with the deadline (Monday or Tuesday) for the county to send weekly IDSR reports to the state. The other seven CSOs interviewed knew the correct deadline.

Apart from a single two-week course in 2009, training of surveillance officers has been quite brief.³⁷ The Director of the Epidemic Preparedness and Response (EPR) Division of the national MoH commented that “3 days or 10 days of training [for surveillance officers] can only address data collection . . .” Funding for “advanced training” of surveillance officers has been included in the USAID budgets for some years. Some officials within the Ministry of Health have proposed a three-month course involving the University of Juba; however, consensus has not yet been reached within the MoH on how to organize this course and whom to train.³⁸

³⁵ See evaluation question number 8 for a discussion of issues related to turnover of County Surveillance Officers.

³⁶ The report of the EWARN assessment mission of June 2011 implied that this allowance was being paid to surveillance officers regardless of whether they could document any supervision. The report recommended “payment of allowances based on proof of credible supervision activities by CSOs and SSOs.”

³⁷ In collaboration with the African Field Epidemiology Network, headquartered in Kampala, Uganda, a two-week course on Outbreak Management was organized in 2009 for about 30 participants, including State Surveillance Officers and some laboratory technicians. These participants returned three months later for a three-day workshop, during which some of them presented the findings from epidemiological investigations they had made. Otherwise, the training of State and County Surveillance Officers related to IDSR appears to have been limited to Rapid Response Team workshops of two-to-five days, two- to three-day *ad hoc* training on response to particular diseases (e.g., acute flaccid paralysis, measles, yellow fever), and attendance at the same basic training as staff of health facilities.

³⁸ One senior MoH official expressed a lack of confidence in the basic qualifications of the existing State and County Surveillance Officers and advocated a return to longer-term training outside of South Sudan, as was previously supported by USAID.

Eight (89 percent) of the nine CSOs interviewed, and three (50 percent) of the six SSOs interviewed, reported that someone from a higher level had visited during the last six months to supervise them. However, no documentation of these supervisory visits was available.

Have IDSR materials been developed and disseminated to health centers and units effectively?

Key findings:

- The IDSR project has developed a case definitions booklet, a case definitions wall chart (“banner”), an outpatient register, a weekly reporting form, a monthly reporting form, a case investigation form, and line listings for different diseases.
- About half of functional health facilities appear to have received a copy of the case definitions, and about half now have booklets of integrated weekly reporting forms.
- Distribution of booklets of bound weekly reports with “carbonated” copies has assured that copies of these key reports are available for review and validation at facility, county, and state levels.
- Reporting tools and case definitions cannot be read by the large number of health workers who are literate only in Arabic.

The evaluation team reviewed the case definitions booklet, a case definitions wall chart (“banner”), an outpatient register, a weekly reporting form, a monthly reporting form, a case investigation form, and line listings for different diseases and found that they were largely adequate for the purpose. Especially effective have been the booklets of bound weekly reports with “carbonated” copies. These booklets have assured that copies of these key reports remain available for review and validation at facility, county, and state levels. Notable shortcomings of the IDSR materials include:

- Some of the case definitions are technically incorrect, while others are unnecessarily complex;³⁹
- The tools are not available in Arabic for the large number of health staff that is only literate in that language. Staff of the Juba office of WHO note that the Ministry of Health has been reluctant to endorse use of Arabic in official documents. However, they may be open to dissemination of Arabic job aides, such as the case definition “banner”;
- No tools (i.e., logs) have been developed for County and State Surveillance Officers to monitor the completeness and timeliness of weekly and monthly reporting;
- A standard outbreak log does not appear to have been disseminated;⁴⁰

³⁹ For example, malaria is now defined as “any person presenting with fever, chills, shivering, sweats, headache, joint pain, nausea and vomiting, and no visible signs of bacterial infection and any other obvious causes of fever have been excluded.” This case definition is not only too complex, but is incorrect, because malaria seldom presents with all of these signs and symptoms. As another example, measles is defined as “any person with fever and maculo-papular (non-vesicular) generalized rash and cough, coryza, or conjunctivitis (red eyes) or any person in whom a clinician suspects measles.” The last part of this definition is incorrect and should be changed to read “. . . or any suspected case of fever and rash that is linked to a laboratory confirmed case.”

⁴⁰ WHO noted that “all state and county surveillance officers received the outbreak log forms during the IDSR trainings. But emphasis was given to SSOs, and majority of the SSOs should have copy of the form.” However, as noted in section III, only two of the six state surveillance offices visited had any outbreak log.

- The guidelines for outbreak investigation have not yet been officially endorsed by the MoH and, hence, have not been disseminated.

Since 2009, quarterly and annual reports of the project documented the distribution of a large number of integrated reporting “tools.”

Table 3 presents statistics on the ratio of the number of weekly reporting booklets distributed per state to the number of functional health facilities in the state. Four of the six states have not yet received enough booklets to distribute a copy to every functioning health facility.

Table 3: Distribution of weekly IDSR reporting booklets, by state and as a percentage of the number of functional health facilities

State/Form	Weekly reporting forms distributed, 2011			
	No. reporting units	Number distributed	Ratio	Comments
Central Equatoria State	191	80	0.42	Shortage
East Equatoria State	99	80	0.81	Shortage
Warrap State	98	80	0.82	Shortage
Jonglei State	82	80	0.98	Shortage
Upper Nile State	58	80	1.38	
Western Bahar el Gazal State	55	80	1.45	

Source: WHO national log for distribution of IDSR materials

Table 4 presents findings on availability of various IDSR materials at state, county, and facility levels at the sites visited by the evaluation team. Compared to the findings of the 2009 assessment, these materials are more readily available at each level.⁴¹

Table 4: Availability of basic IDSR materials by sites visited by the evaluation team

Form/Location	State (n=6)		County (n=9)		Health facility (n=38)	
	#	%	#	%	#	%
IDSR case definition booklet	6	100%	4	44%	6	16%
Case definition wall chart	4	66%	7	78%	21	55%

⁴¹ The report of the May 2009 IDSR assessment found standard case definition booklets, weekly surveillance reporting forms, and monthly outpatient forms at 9 percent, 27 percent, and 48 percent of facilities, respectively. Weekly surveillance forms, monthly surveillance forms, and case notification forms were found at 71 percent, 64 percent, and 29 percent of County Health Departments surveyed. As of early 2009, separate forms were used to report each disease. By the time of the May 2009 assessment, it was noted that “integrated reporting forms [are] adapted but yet to be distributed.” The 2009 Assessment found IDSR training materials at only 3 percent of facilities.

Form/Location	State (n=6)		County (n=9)		Health facility (n=38)	
	#	%	#	%	#	%
IDSr training materials	5	83%	4	44%	2	5%
National surveillance guidelines	4	66%	3	33%	0	0%
EPR guidelines	3	50%	0	0%	0	0%
Weekly reporting forms	6*	100%	9	100%	25**	79%
Monthly reporting forms	NA	NA	NA	NA	23***	72%
Rumors/outbreak log	2	33%	0	0%	0	0%

* One form was not standard (Warrap State).

** Eight (21 percent) of the weekly forms were not standard

*** Ten (26 percent) of the monthly forms were not standard.

Note that the weekly reporting booklets were found at only about half (17/38) of health facilities visited. Another eight facilities had integrated, non-standard weekly reporting forms.

Table 5 presents findings on the availability of weekly reporting forms by type of health facility. Note, in particular, that only four of seven hospitals and eight of fifteen PHCUs visited by the evaluation team had any type of form for weekly reporting.

Table 5: Availability of IDSr weekly reporting booklets at sites visited by the evaluation team, by type of health facility

Health facility	Weekly reporting forms							
	Yes				No		Total	
	Standard		Non-standard		#	%	#	%
	#	%	#	%				
Hospital	3	43%	1	14%	3	43%	7	100%
PHCC	10	63%	3	19%	3	19%	16	100%
PHCU	4	27%	4	27%	7	47%	15	100%

Responding to the findings on dissemination and availability of reporting tools, staff of the Juba office of WHO wrote that “the distribution of the tools has become more complex—first, the MoH-Juba instructed WHO to hand over all reporting tools to the SMoH [State Ministry of Health], then later to the NGOs. [Also] there is no mechanism in place to monitor the availability of reporting tools in the health facilities.”

*Has training of primary health care workers on epidemic preparedness and response been effective?
Are trainees using the IDSR materials?*

Key findings:

- Nationwide, at least 1,500 primary health workers have attended three-day IDSR workshops.
- It is not possible to reliably estimate the percentage of health facilities in South Sudan with at least one health worker trained in IDSR. It is also not possible to estimate the numbers of Community Health Workers (CHWs), nurses, Clinical Officers (COs), and doctors that have attended the course. At least one person had attended the IDSR workshop at about half of the health facilities visited by the evaluation team.
- Roughly half of health workers interviewed were able to state appropriate case definitions and correctly specify the diseases that should be reported immediately. Health workers' IDSR knowledge appeared to relate more to their basic qualifications and pre-service training than to whether they had attended a three-day IDSR workshop.

Multiple project documents report that large numbers of primary health workers—at least 1,500 health workers in 71 of 80 counties of 10 states—have received basic IDSR training since 2009.⁴²

The IDSR plan of action prepared for 2007–2008 called for a Training Needs Assessment (TNA) to be carried out, but no documentation of a TNA could be found. The progress report for FY 2009 Q1 to Q3 notes that an IDSR training plan was available by June 2009. However, this training plan could not be located by the evaluation team. In the absence of such documentation, it is unclear which cadres of “personnel” have been targeted for basic training or how many of each cadre need to eventually be trained.⁴³

The evaluation team found that the revised IDSR training content was appropriately simplified and adequately covered the basic aspects of IDSR. The standard three-day course was probably too short to cover the material in the modules given the educational level of the participants and the need for additional hands-on training on use of the reporting forms.⁴⁴ Little, if any, documentation is available on the training methodology. The evaluation team thus could not assess whether the methods are appropriate for participants with limited learning skills. The various training reports said little about the learning that was achieved. For example, the training reports did not specify whether learning was assessed with post-tests or, if so, what these post-tests indicated.

⁴² Project documents provide various estimates of the number of health workers trained in IDSR. The IDSR FY 2011 Draft SOW from October 3, 2011 notes that “over 1,500 health workers” have been trained. The PowerPoint presentation entitled “Communicable Disease Surveillance and Response in South Sudan: Backgrounds, Achievements, and Challenges” (from the annual National IDSR Review Meeting in June 2011) notes “2,900 health workers [were] trained on IDSR between 2009–2011”; IDSR supply and training status, September 3, 2011, WHO; The IDSR FY 2010 Revised Work Plan indicates that \$280,325 was budgeted for training 600 facility workers = \$490/worker.

⁴³ According to the RSS Health Facility Mapping, as of 2009 South Sudan had 4,212 CHWs, 1,843 nurses, and 269 COs.

⁴⁴ Staff of the Juba office of WHO wrote that, “the three-day course is a problem for someone who has never attended IDSR. Maybe we should develop modules for a refresher course.”

Because the information recorded on each participant is incomplete and often illegible, it was not possible to compile a list of health facilities where at least one health worker had been trained in IDSR.⁴⁵ For the same reason, it is not possible to know the numbers of CHWs, Clinical Officers, nurses, and medical doctors trained. Annex 6 provides a summary of the information extracted from the available training reports and signature sheets.⁴⁶

Tables 6 and 7 present findings on the proportion of health facility staff interviewed by the evaluation team who reported that they had received training in IDSR. These statistics suggest a clear improvement since 2009.⁴⁷

Table 6: Percentage of health workers at health facilities visited by the evaluation team who reported that they had received IDSR in-service training, by state

IDSR Training/State	CES	EES %	Jonglei	Upper Nile	Warrap	WBEG	Total
Trained/Total %	6/9 66%	5/5 100%	1/3 33%	0/4 0%	4/9 44%	5/8 62%	21/38 55%

Table 7: Percentage of health workers at health facilities visited by the evaluation team who reported that they had received IDSR in-service training, by type of health facility

IDSR training /Type of health facility	Hospital	PHCC	PHCU	Total
Trained/ Total %	4/7 57%	8/16 50%	9/15 60%	21/38 55%

At each health facility visited, the evaluation team interviewed the health worker who was responsible for completing the weekly IDSR report form. The team assessed the health workers' knowledge of cases definitions and knowledge of which diseases to report immediately. In this way, the health workers' "IDSR knowledge" was scored from 0 to 10. Table 8 presents the distribution of IDSR knowledge scores.

⁴⁵ The report for the September 2009 training in Warrap at least attempted to estimate training coverage. It noted that the ratio of participants to health facilities varied from 1.2 in one county to 0.2 in another county.

⁴⁶ WHO was unable to locate the training reports and signature sheets for the trainings conducted from January to November of 2010.

⁴⁷ The May 2009 assessment found that the facility in-charge had been trained in IDSR at only 18 percent of facilities.

Table 8: Number and percentage of health workers by IDSR knowledge score

Health Staff/Knowledge	#	%
Low (≤ 7 points)	16	47%
High (> 7 points)	18	53%
Total	34	100%

As shown in Table 9, the percentage of health workers with high scores was greater at hospitals and PHCCs than at PHCUs.

Table 9: Percentage of health workers scoring 8 or higher, by type of health facility

Knowledge/Type of facility	Hospital	PHCC	PHCU
Low (≤ 7 points)	3 (43%)	5 (33%)	8 (67%)
High (> 7 points)	4 (57%)	10 (67%)	4 (33%)
Total	7 (100%)	15 (100%)	12 (100%)

Table 10 shows that the percentage of CHWs with high IDSR knowledge scores was significantly lower than the percentage of other cadres that had high IDSR knowledge scores.

Table 10: Percentage of health workers scoring 8 or higher, by cadre of worker

Knowledge/Cadre	CHW	CO/MA	Nurse/Midwife	Doctor
Low (≤ 7 points)	7 (64%)	3 (43%)	1 (20%)	2 (20%)
High (> 7 points)	4 (36%)	4 (57%)	4 (80%)	8 (80%)
Total	11 (100%)	7 (100%)	5 (100%)	10 (100%)

Fifty-eight percent of health workers trained in IDSR scored an 8 or higher, compared to 47 percent of health workers not trained in IDSR. The mean score of IDSR-trained health workers was 7.8, while the mean score of IDSR-untrained health workers was 7.4. These small differences suggest that health workers' IDSR knowledge was more closely associated with their basic qualifications and pre-service training (see Table 10) than whether they had attended a three-day IDSR workshop.

The assessment of May 2009 found that there was “. . . no program for regular supervision and [supervisors] only move out when there are problems or outbreaks to investigate.”⁴⁸ IDSR project quarterly and annual reports note that central- and state-level staff have been conducting supervision with a checklist for the last

⁴⁸ The May 2009 assessment found that 71 percent (10/14) of County Health Departments had received some supervision from state level in the last six months, but the report does not specify whether this supervision focused on disease surveillance.

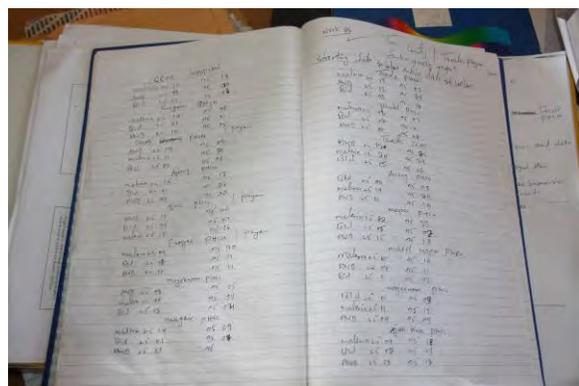
couple of years. This IDSR supervisory checklist captures all the important information needed to monitor IDSR performance. However, during their sites visits, the evaluation team found only one copy of this checklist, and this one copy was blank. In some counties, the team found alternative checklists in use to structure more comprehensive supervision of a broad range of functions, including infrastructure development, equipment supply, human resources, drug supply, service delivery, and routine reporting (Health Management Information System - HMIS) These more comprehensive checklists included only a single poorly worded question about reporting of IDSR diseases. All County Surveillance Officers said that they had made supervisory visits to health facilities in the last six months, and 32 percent (12/38) of health facility informants reported that a supervisor had visited in the last six months. Only 22 percent of CSOs and 7 percent of health facilities had any written documentation of such supervision.

2. Timely reporting and response

II. Are IDSR data accurately recorded and reported on a timely basis to higher levels within the system?⁴⁹

Key findings:

- At state and county levels, monitoring of routine reporting by health facilities has been quite weak. In fact, there is no system for monitoring the timeliness of reporting.
- Contrary to national IDSR guidelines, staff at facility, county, and state levels complete and immediately submit very few case investigation forms and line listings.



A core IDSR indicator for WHO/AFRO and the CDC is the “Proportion of health facilities submitting weekly or monthly surveillance reports on time to the district level.”⁵⁰ This is also a core indicator for the Proposed Integrated Disease Surveillance and Response Action Plan for South Sudan for 2009 to 2013.

The evaluation team did not find any evidence that there was any system for recording the dates that weekly and monthly surveillance reports are sent and received, and it also did not find any system for monitoring the timeliness of reporting from health facilities.⁵¹ Fourteen percent (5/36) of health facilities had some written documentation of the date that weekly reports had been submitted. Eleven percent (1/9) of County Surveillance Officers and no (0/6) State Surveillance Officers recorded the dates that they received weekly reports from health facilities. For surveillance of diseases of explosive epidemic potential, a failure to document timeliness of reporting is a critical shortcoming.⁵²

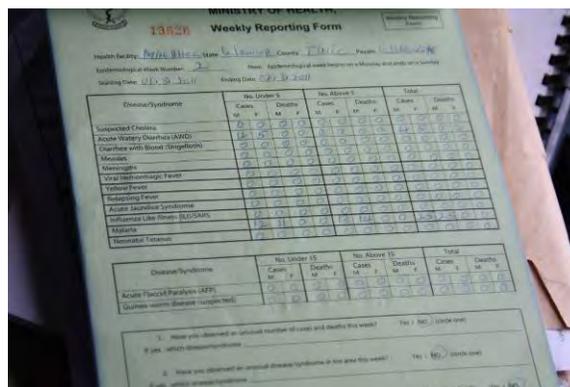
⁴⁹ Question number 4 of the Scope of Work.

⁵⁰ The Guide for the Use of Core Integrated Disease Surveillance and Response Indicators in the African Region can be downloaded from www.cdc.gov/idsr/files/guide.pdf.

⁵¹ The sole exception to this observation is that dates are recorded whenever data is transmitted by email. Even in such cases, such emails typically cannot be easily and rapidly retrieved; The report of the May 2009 assessment notes that “. . . some key IDSR indicators at county level . . . couldn’t be computed due to lack of data at the time we visited these structures: These indicators include timeliness of weekly reporting from PHCC in last 3 months. . . .”

⁵² In the near future, it will hopefully be possible to use the DHIS system to measure and automatically report on these and some other key indicators.

The IDSR guidelines call for individual “case-based reports” or line listings to be completed and submitted immediately to a higher level for each case of acute flaccid paralysis (AFP)/polio, viral hemorrhagic fever (VHF), anthrax, cholera, dysentery, guinea worm, measles, neonatal tetanus, rabies, plague, yellow fever, or typhoid. A core IDSR indicator for WHO/AFRO is the “Proportion of cases of diseases targeted for elimination, eradication, and any other diseases selected for case-based surveillance which were reported to the district using case-based or line listing forms.” This is also a core indicator for the Proposed Integrated Disease Surveillance and Response Action Plan for South Sudan for 2009 to 2013.



When shown the case investigation form, only 6 percent (2/36) of health facility informants said that they had ever seen it before. The evaluation team found completed case investigation forms at only one of 38 health facilities visited, three of nine county surveillance offices, and five of six state surveillance offices. The great majority of these completed case investigation forms appear to have completed by AFP surveillance staff. Focusing on surveillance for measles and acute jaundice syndrome (AJS), the evaluation team found that, since June 1, 2011, a total of 72 cases of measles and AJS had been reported from the counties visited, but completed case investigation forms were available at the county health departments (CHDs) for only six of these 72 reported cases. Likewise, since June 1, 2011, a total of 265 cases of measles and AJS had been reported from the states visited, but completed case investigation forms were available at the state surveillance offices for only one of these 265 cases.⁵³

In response to these observations, staff of the Juba office of WHO noted that case-based investigation forms are not routinely kept at county and state surveillance offices. Instead, they are all sent to Juba. This is not a satisfactory practice (and it is *not* the practice of the polio eradication program, which assures that a copy of the case investigation form is kept at the state surveillance office for every case of AFP). It leaves the county and state surveillance office with absolutely no record of the case investigation (especially if the surveillance office does not maintain any outbreak log) unless a copy of the case investigation form is promptly returned from Juba along with the lab result.⁵⁴

⁵³ The evaluation team found more case investigation forms at the offices of WHO staff. However, it appears that even when these forms are combined with the forms at the state surveillance offices, case forms have been completed for only a small fraction of the reported cases that require such forms.

⁵⁴ As noted in section III below, for many, if not most, lab specimens, Juba has either not returned any lab results or returned them quite late. Staff of the Juba office of WHO explained that one reason that it has been difficult to return lab results to the states is that the laboratory in Nairobi often sends results without the unique identifier attached. Without a unique identifier, it is very challenging to link up the lab result with the case-based investigation form, hence it becomes very difficult to return the case-based investigation form.

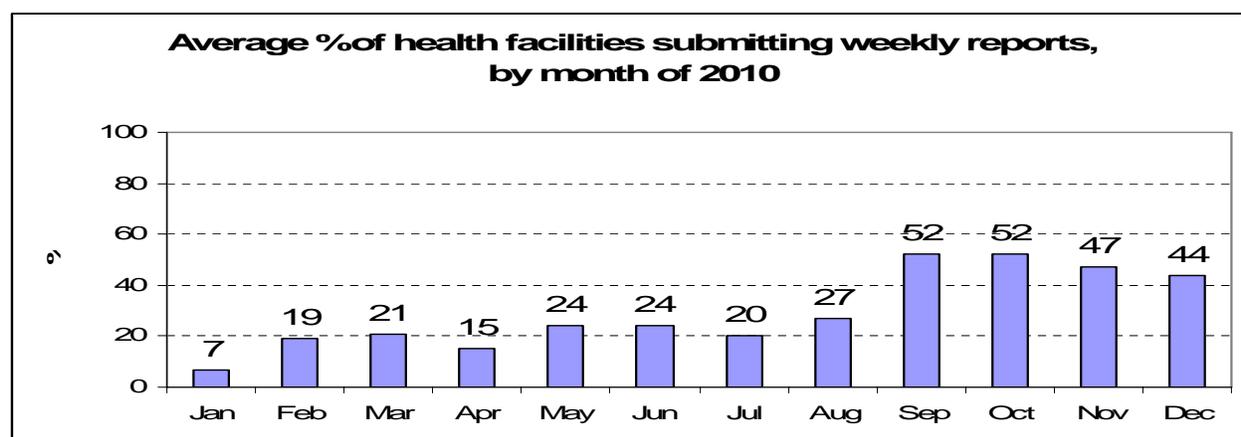
Of health facilities and counties whose staff have been trained, which, and how many, are submitting IDSR reports? How many submit regularly on a weekly and monthly basis?

Key findings:

- During the first six to nine months of 2010, the percentage of health facilities reporting weekly rose from less than 20 percent to more than 40 percent.
- Since October of 2010, the percentage of health facilities reporting weekly has held roughly constant at 40–50 percent nationwide.
- Completeness of weekly reporting has been significantly higher and more consistent in some states than in others.
- Due to the incompleteness of information collected on those who were trained in IDSR, there is very little data with which to judge the extent to which such training improves IDSR reporting. Of those sites visited by the evaluation team, the completeness of weekly reporting was slightly higher from health facilities with IDSR-trained staff than it was from health facilities without IDSR-trained staff.
- A wide variety of mutually incompatible forms are used by health facilities for monthly reporting of diseases. As a result, management and aggregation of monthly data at higher levels is very difficult.

IDSR project reports and presentations from the Annual IDSR Review Meeting of 2011 document steady increases during 2010 in the percentage of health facilities submitting weekly reports. For example, Figure 3 below shows that the completeness (the percentage of health facilities reporting weekly) increased from an average of 16 percent in the first quarter of calendar year 2010 to 48 percent in the fourth quarter of 2010. This level of completeness represents a striking improvement from the IDSR evaluation of May 2009, which found that only 27 percent of facilities even had blank weekly reporting forms (and even those facilities with forms typically reported only when they suspected an outbreak rather than routinely).

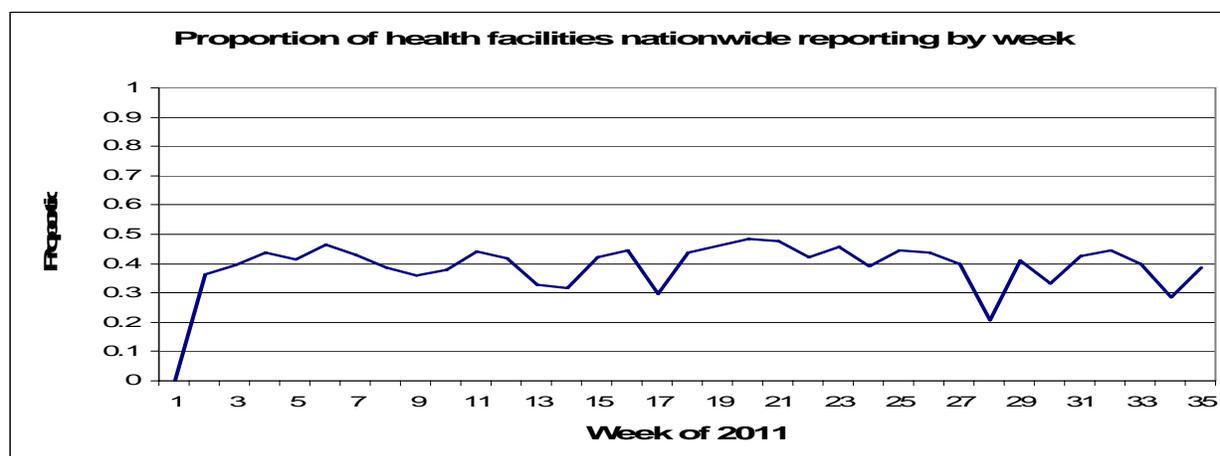
Figure 3: Trend during 2010 in the completeness of weekly reporting by health facilities nationwide



Source: PowerPoint presentation at the Annual IDSR Review Meeting in June 2011

Figure 4 below shows that the subsequent completeness of weekly reporting has stayed roughly at a plateau of 40–50 percent of health facilities. Figure 4 also shows how reporting has dropped dramatically during certain weeks.

Figure 4: Proportion of health facilities nationwide reporting weekly during 2011



The figures in Annex 7 show how the completeness of weekly reporting varies significantly among states as well as from week to week.⁵⁵ Completeness has been consistently low from Jonglei State. In contrast, except for a few weeks when reporting was disrupted, completeness has been stable and consistently high from Lakes State. Finally, reporting from Warrap State has been quite erratic, and completeness has clearly deteriorated since week 23 (the beginning of June) of 2011.

Table 11 shows the percentage of health facilities that have reported at least 50 percent of weeks during the first 35 weeks of 2011. Nationwide, about half of all functional health facilities have so far reported at least 50 percent of weeks this year. Weekly reporting has been far more complete from Lakes State and Western Equatoria State (WES) than it has been from Jonglei State and Upper Nile State.

Table 11: Percentage of health facilities reporting at least 50% of weeks during 2011, by state

State	Number of functional health facilities	Number of health facilities reporting at least 50% of weeks during 2011	Percentage of health facilities reporting at least 50% of weeks during 2011
CES	191	111	58%
EES	99	23	23%
Jonglei	81	11	14%
NBEG	66	31	47%
WBEG	70	19	27%
Lakes	63	50	79%

⁵⁵ As with Figure 4, these figures are based upon the data in the national dataset of weekly reports for weeks 1 to 35 of 2011.

State	Number of functional health facilities	Number of health facilities reporting at least 50% of weeks during 2011	Percentage of health facilities reporting at least 50% of weeks during 2011
Unity	51	22	43%
Warrap	98	46	47%
WES	200	151	76%
Upper Nile	58	10	17%
Nationwide	977	474	49%

Review of data in the national dataset of weekly reports shows that about a quarter of health facilities report regularly; another quarter of health facilities report at least 50 percent of weeks; another quarter of health facilities report infrequently; and a quarter of health facilities do not report at all. There are some entire counties—e.g., Pigi in Jonglei State, Raja in Western Bahr el Ghazal (WBEG) State, and six of the 13 counties of Upper Nile State—where no health facilities have ever reported or only one health facility has very infrequently reported.

Table 12 presents data collected from each of the nine counties visited by the evaluation team on the completeness of weekly reporting during August 2011. Consistent with Table 11, Torit in Eastern Equatoria State (EES) and Bor in Jonglei State had lower completeness, while Morobo and Yei in Central Equatoria State (CES) had higher completeness.

Table 12: Completeness of IDSR weekly reports for August observed at health facilities, by county visited by the evaluation team

County	Number of health facilities	Number of weekly reports observed	Number of reports expected	Percent completeness for August
Torit	44	39	176	22%
Malakal	12	32	48	67%
Bor	25	17	100	17%
Morobo	12	42	48	88%
Yei	36	97	144	67%
Jur River	27	92	108	85%
Twic	25	33	100	33%
Gorgrial West	15	20	60	33%
Wau	98	97	392	25%
Total	294	469	1176	40%

As noted above, data have not been captured at any level (county, state, or national) on the health facilities where at least one person has been trained in IDSR. Hence, the evaluation team is not able to determine whether the data suggest that the completeness of reporting has improved following training.

Of those sites visited by the evaluation team, the completeness of weekly reporting was somewhat higher from health facilities with IDSR-trained staff (where 71 percent of the four expected weekly reports for August were available for inspection) than it was from health facilities without IDSR-trained staff (where just 61 percent of the weekly reports for August were available).

With hundreds of health facilities reporting every week, it is very challenging for IDSR personnel at county, state, and central levels to compile and transmit in a timely and reliable way (i.e., without transcription and arithmetic errors) the large volumes of data being generated. As noted by the FY 2011 Quarter One report, “as the number of health facilities reporting increases week after week, large volumes of data are generated through the disease surveillance and it should [be] managed electronically.” Currently, the weekly data from health facilities are entered into MS Excel spreadsheets by the State Surveillance Officer and a data entry assistant, if available. These Excel files are then sent weekly by email to the national office of IDSR.

Microsoft Excel provides a simple and easily customized way to store and analyze data. However, the software has major some limitations when used to manage data⁵⁶ Moreover, the evaluation team noted several significant problems with the Excel files that are used to store IDSR data at state and national levels in South Sudan.⁵⁷ While electronic data management is not a core activity being funded by USAID, it is unlikely that the IDSR program will be able to effectively handle and make use of the very large amount of data it is generating unless progress is made on this front.

At the 38 health facilities it visited, the evaluation team documented that at least 10 different mutually incompatible forms are currently used for monthly reporting of diseases. As a result, management and aggregation of monthly data at higher levels is extremely difficult. In fact, most CSOs and SSOs appear not to manage monthly reports at all—this task is usually dealt with by the separate M&E office of the CHD or State Ministry of Health (SMoH). These findings were discussed with the Director of the Monitoring

⁵⁶ The number of records that can be stored in Excel is limited to the number of rows in a worksheet. Data are stored as a single “flat” file without any associated files. The result is that, to hold all essential data, records are likely to have redundant data, such as epidemiological week, events under surveillance, etc. repeated many times on each Excel worksheet. Compared to Excel, more powerful data management software uses relational databases. This means that the software has the capability to store data in more than one table and relate or link the tables on the basis of common fields. This eliminates the redundancy of a “flat” file. Moreover, with a relational database, data can be entered using forms that resemble the paper reporting forms and which reduce the keystrokes required and minimize the entry of invalid data. Preprogrammed database “queries” permit automatic reporting on key indicators and even automatic presentation of entire reports.

⁵⁷ Problems noted by the evaluation team include the following: (1) The Excel files in some states have a different format than the Excel file used at national level. In a given state, and also at national level, the listing of health facilities change from one week to another. Both types of inconsistency (between sites and between weeks) make merging of data from different states and different weeks very difficult and increase the probability of errors (often the data have to be manually transcribed or cut and pasted multiple times). (2) Evaluators identified a number of entries (e.g., 36 cases of VHF from one PHCU in one week) which appear to be the result of typographic errors. Excel provides no practical way to validate data upon entry. (3) The summary rows in the current Excel sheets (e.g., total cases for the week from all health facilities in the state) contain a number of inconsistent and incorrect formulas.(4) The worksheets are not password protected, so any user can introduce errors into the formulas and the lists of health facilities. (5) The Excel workbooks have not been set up to automatically display key indicators (e.g., completeness) or graphs of disease trends.

Division, Dr. Richard Lako. He explained that a format for harmonized monthly reporting of health problems and health services had been designed following a pair of consensus-building workshops that took place in the last 12 months. These formats are now being printed and distributed by lead agencies (IMA-World Health and Norwegian People's Aid) working in four of the 10 states (Upper Nile, Jonglei, CES, and EES), and these are the basis for the data entry screens of the District Health Information System (DHIS) software that is now being deployed in these states and elsewhere in the country. However, it appears that, until now, the agencies working in many of the states have not yet adopted the new official monthly reporting formats. It should be noted that, unlike the monthly reporting form which the IDSR program paid to print and distribute, the new official monthly format includes only a small space in which to record data on certain diseases of epidemic potential.⁵⁸ When asked about this new official monthly reporting form, MoH and WHO officials responsible for IDSR activities did not seem to be aware of it.

A core IDSR indicator for WHO/AFRO is the "Proportion of districts submitting weekly or monthly surveillance reports on time to the next higher level." This (with "counties" substituted for "districts") is also a core indicator for the Proposed Integrated Disease Surveillance and Response Action Plan for South Sudan for 2009 to 2013.⁵⁹ The evaluation team found that in fact none of the counties visited were producing *any* weekly report. For example, no county visited aggregated and produced *any* summary of the data received from health facilities. The County Surveillance Officers do not appear to even review the data. Their function appears to be limited to collecting weekly reports from health facilities and then transferring these reports to the state surveillance office. Annex 8 includes four examples of data reported on weekly forms during 2011 that should have resulted in an alert or at least an effort to verify the data (and correct it if necessary). Instead, in each case, the alarming data appear to have merely been transmitted to a higher level without any investigation and without any comment.

Have the communication and transportation equipment provided at the state and county levels improved accurate and timely reporting? Is equipment being used effectively and appropriately?

Key findings:

- Informants reported that the motorcycles and bicycles supplied by the project had helped with reporting and supervision of IDSR activities. However, less than half of states and counties reported that they used the Codan high-frequency (HF) radios and Thuraya satellite telephones to assist with weekly reporting. In fact, significant numbers of SSOs and CSOs reported that they were not using these radios and satellite phones at all.
- For most counties visited by the evaluation team, mobile phones are now used more frequently to support surveillance activities than HF radios and satellite phones.

USAID has so far invested roughly \$500,000 in the procurement of high-frequency radios, satellite telephones, and internet access. Another \$500,000 has been invested in procurement of motorcycles and

⁵⁸ The form says in two lines of small font, "Please indicate all suspected cases of any of the diseases listed below: Onchocerciasis, STI, Bilharzia, Kala Azar, Lymphatic Filariasis, Trypanosomiasis, Rabies, Plague, Leprosy, Brucellosis, Typhoid Fever." A small space is provided to record the data on all 11 of these diseases. No mention is made of the diseases reported on the weekly report.

⁵⁹ The report of the May 2009 assessment notes that "currently there are no monthly reports received at National level." The same report notes that completeness of CHD weekly reporting was 21 percent, completeness of CHD monthly reporting was 43 percent, and the timeliness of CHD monthly reporting was 14 percent. The report does not adequately define any of these indicators of CHD reporting. It states that "... completeness and timeliness for weekly and monthly reporting captured at the county level was still far below the targets. The lack of databases at county level makes it even harder for surveillance officers to derive these indicators and indeed most of the counties visited did not conform to the desirable system of displaying the indicators on the wall."

bicycles. This is meant to support communications and travel between state, county, and facility levels.⁶⁰ According to the WHO document entitled “IDSR Coverage and Support Staff,” as of June 2011, Codan HF radios and Thuraya satellite phones had been supplied to 50 counties, while motorcycles/bicycles had been supplied to 65 counties.⁶¹ Project reports and presentations at the IDSR Annual Review Meeting note that the timeliness of reporting, laboratory confirmation, and outbreak response has improved as a result of the communication and transportation equipment.⁶²

Tables 13 and 14 present findings from state and county levels, respectively, on the usage of the various equipment supplied by the IDSR program. Note that less than half of states and counties reported that they used the Codan radios and Thuraya telephones to assist with weekly reporting. In fact, significant numbers of SSOs and CSOs reported that they were not using these radios and satellite phones at all.⁶³

Table 13: Uses of equipment distributed by the IDSR program, as reported by State Surveillance Officers

Use/Equipment	Codan radio	Thuraya	Motorcycle	Bicycle	Mobile
Weekly reporting	3 (50%)	2 (33%)	5 (83%)	4 (67%)	3 (50%)
Alerts/outbreaks	0 (0%)	2 (33%)	4 (67%)	1 (17%)	3(50%)
Outbreak response	1 (17%)	2 (33%)	4 (67%)	1 (17%)	1 (17%)
Equipment not used	1 (17%)	2 (33%)	0 (0%)	2 (33%)	0 (0%)

Table 14: Uses of equipment distributed by the IDSR program, as reported by County Surveillance Officers

Use/Equipment	Codan radio	Thuraya	Motorcycle	Bicycle	Mobile
Weekly reporting	2 (22%)	1 (11%)	7 (78%)	7 (78%)	7 (78%)
Alerts/outbreaks	2 (22%)	2 (22%)	3 (33%)	1 (11%)	1 (11%)
Outbreak response	0 (0%)	2 (22%)	5 (56%)	1 (11%)	1 (11%)
Equipment not used	3 (33%)	4 (44%)	0 (0%)	0 (0%)	0 (0%)

Staff of the Juba office of WHO commented that the findings presented in Table 14 may not be representative of the usage of communications equipment in the more remote counties not visited by the

⁶⁰ The May 2009 assessment found that half of the CHDs surveyed had electrical power of some sort, 43 percent (6/14) had telephone service, 14 percent (2/14) had radios, 7 percent (1/14) had internet access, and none had a vehicle or motorcycle.

⁶¹ According to the IDSR FY 2010 revised work plan, the Codan radios and Thuraya phones cost approximately \$6,442 per site (or roughly \$322,000 to date), while the motorcycles and bicycles cost \$7,434 per site (or roughly \$483,000 to date); The evaluation team received a list of IDSR equipment distributed by state and county as of October 5, 2010. The team asked for a more recent list but was unable to obtain such a document.

⁶² The FY 2010 Q2 progress report notes that “. . . availability of communication and transport equipment for surveillance officers played a crucial role on improved and prompt outbreak investigation, while reducing the lead time for outbreak response.”

⁶³ Reasons given for not using the Information Communication Technology included the need for a technician to install the antennae, the need for training in how to operate the radio, the difficulty accessing funds to purchase the expensive units for the Thurayas, and the fact that the equipment has only recently reached the state level and may not yet have been distributed to county level.

evaluation team. For example, fewer of these more remote counties have access to a mobile phone signal, and HF radios or Thuraya telephones might thus be more highly valued.

Only two of the nine counties visited (Jur River and Gogrial West) reported that they were using either the Codan radios or the Thuraya telephones to assist with weekly reporting. According to the national dataset of weekly reports, the completeness of weekly reporting during the first 35 weeks from health facilities in these two counties is the same as the completeness from the health facilities in the other seven counties visited (41 percent vs. 42 percent).

III. When outbreaks and epidemic alerts are reported, are they responded to promptly and effectively?⁶⁴

Key findings:

- Neither CSOs nor SSOs are required to routinely produce any reports of their own. As a result, most County and State Surveillance Officers do not adequately review the weekly IDSR data, and possible outbreaks or errors in the data go undetected. The evaluation team found no evidence of analysis of data (e.g., graphs or data tables) at any of the county health departments visited.
- The lack of completed case investigation reports and line listings at state and county surveillance offices severely limits the information available for investigation of suspected outbreaks.
- WHO has sought to reinforce the capacity of SSOs and CSOs by encouraging WHO staff at the state level to support IDSR activities, including investigation of suspected outbreaks. The absence or incompleteness of key documentation (e.g., outbreak logs, case investigation reports) at most state and county surveillance offices suggests that, with few exceptions, it is these WHO staff, and not the State and County Surveillance Officers, who have been active with outbreak investigations.
- The outbreak logs currently in use at state and national levels do not explicitly record the date of (first) notification or the date that any laboratory specimen was collected. As a result, the outbreak logs do not provide a reliable way of assessing the timeliness of investigations.
- There is no laboratory in South Sudan that can confirm the most important diseases of epidemic potential. To confirm outbreaks, laboratory specimens must be sent to Nairobi.
- During the first eight months of 2011, the average delay between collection of a specimen and return of the result to Juba was 22 days. Such a delay is not compatible with timely detection and correct response to outbreaks.
- Several states complained of months-long delays in the receipt of lab results from Juba.

The FY 2010 Quarter Two progress report notes that “one of the greatest achievements for this project is that the investigation of the above outbreak rumors was undertaken by the trained surveillance officers at state and county level with minimum support from Juba level.”

⁶⁴ Question number 5 of the Scope of Work.

The “outbreak log” is critically important to the functioning of disease surveillance and response. It should capture all alerts of suspected outbreaks and record, among other information, a series of associated dates: date of onset, date of notification, date of investigation/collection of lab specimens, date lab result became available, and date of any public health response. This permits monitoring of the timeliness of investigation, laboratory confirmation, and public health response. Remarkably, none of the nine counties visited by the evaluation team, and only two of the six states visited, had *any* outbreak log.

As discussed above (in response to question 4), very few completed case investigation forms could be located at the county and state surveillance offices visited. Only two CHDs visited had any outbreak investigation reports available.⁶⁵ Five of six states had a small number (one to four) of outbreak investigation reports.

The absence or incompleteness of key documentation at most state and county surveillance offices suggests that, with few exceptions, it is the WHO staff at state level (International Focal Points and National Focal Points, and especially the staff for Expanded Program for Immunization and polio eradication), and not the staff employed by the MoH at state and county levels, who have been active with outbreak investigations.⁶⁶

The evaluation team reviewed the available outbreak logs to assess the timeliness of investigation of suspected outbreaks. Unfortunately, the outbreak logs available at state and national levels lack some key information.⁶⁷ The logs have columns to record “date of onset,” “date of report” (for the national log this appears to mean the date that the SMOH reported the alert to the national level), and “date of response” (the evaluation team was unsure what this column meant, whether date of investigation, date lab specimen collected, or date of public health response). There is no clear record of the date the suspected outbreak was first notified (i.e., the date that the facility or county notified the SMOH).

Various quarterly and annual project reports note the timeliness of investigation following notification and the timeliness of laboratory confirmation following collection of specimens. The reported timeliness of investigations is based upon analysis of dates recorded in the national outbreak log.⁶⁸ Unfortunately, as noted above, this log fails to explicitly record such information as the date of original report of the suspected outbreak and the date that lab specimens were collected. This calls into question whether timeliness of investigations can be fairly assessed using only the data in the national outbreak log, as it is now structured.

The FY 2010 Annual Report notes that the “lack of public health reference laboratory is hampering the prompt outbreak investigation and response,” and that “southern Sudan still lacks public health reference laboratories, and it will take another year or so to establish functioning public health reference facility. In the mean time, WHO will continue to facilitate the collection and transportation of laboratory specimens to CDC and African Medical and Research Foundation laboratories in Nairobi.” Included as Annex 9 is a summary of what the evaluation team learned about issues that need to be addressed before the national public health reference laboratory will be able to confirm IDSR focus diseases.

⁶⁵ Both of these CHDs were in CES. Each of these CHDs had a single outbreak investigation report that included analyzed case-based data.

⁶⁶ There is documentation to show that the State Surveillance Officers of CES and Warrap have been active with outbreak investigations.

⁶⁷ Regarding the outbreaks log, the report of the 2008 annual review comments that “what was notable was the number of blanks—lack of information. . . [e.g., date of onset, reported cases, response type].”

⁶⁸ Comparison of the state outbreak logs from Warrap and CES with the national outbreak log shows significant discrepancies. Significantly more alerts are recorded from each state in the national log than are recorded from the state in the state log. For Warrap, for the first six months of 2011, 25 alerts appear in the national log and six alerts appear in the state log. For CES, for the first six months of 2011, 18 alerts appear in the national log and 11 alerts appear in the state log. Matching these alerts between logs is very difficult because the national log has assigned different serial numbers to the alerts than those that appear in the state outbreak log. However, from matching a limited number of cases based upon the other information provided, it becomes clear that the alerts were, in some cases, reported to the state level earlier than they were reported to national level. Lab results are not recorded for the vast majority of suspected outbreaks listed on the various outbreak logs.

WHO maintains two separate logs for lab specimens.⁶⁹ Analysis of the dates recorded in the second lab log shows that during the first eight months of 2011, an average of 22 days elapsed between collection of a lab specimen from a patient and return of the lab result to Juba.⁷⁰ Results of only 17 percent of specimens were returned within seven days or less.⁷¹ A delay of greater than seven days is not compatible with timely detection and correct response to outbreaks.

Surveillance staff in three of the six states visited (WBEG, CES, and Jonglei States) complained that they were not informed of lab results even months after the specimens had been sent to Nairobi.⁷² The laboratory log book compiled by the state lab coordinator for WBEG State showed that the state had received absolutely no feedback from Juba on any of 31 specimens sent during 2011.⁷³ It may be due to such delays in receipt of lab results that public health officials in Warrap State decided to launch a measles mop-up vaccination campaign on October 8, 2011 before they had laboratory results to confirm a measles outbreak.

The May 2009 assessment found that “there was evidence of an Epidemic Preparedness and Response committee at the national level, as seen through weekly meetings well attended by MoH departments, agencies, and local NGOs to present and discuss disease problems and actions.” At the time of the evaluation, the Director of the EPR Division of the MoH reported that the EPR Task Force had not met for the last three months.

SSOs reported that there are functional EPR committees in four of the six states visited. However, EPR plans and minutes of meetings were available for only one state and three states, respectively. CSOs reported that there are functional EPR committees in two of the nine counties visited (22 percent), although EPR plans and minutes were not available for any of the counties.

Informants suggested that it is now the health clusters at state and national levels which function as fora for dissemination of information about suspected outbreaks and for coordination of response.

To what extent are states and counties prepared to respond to outbreaks vis-à-vis repositioning of drugs, reagents, vaccines, personal protective equipment, and materials?

Key findings:

- The evaluation team did not receive the documentation required to adequately assess progress with this objective.
- Four of six SSOs interviewed, and one of nine CSOs interviewed, reported that supplies had been repositioned at their level to prepare for a possible future epidemic.

⁶⁹ One log is used to record the specimens sent to Nairobi, and a separate log is used to record the lab results emailed from Nairobi. The first log records a unique identifier code (“Epidemiological number”) for each lab specimen, while the second log does not record this number.

⁷⁰ The average delay between collection of the specimen and air transport of the specimen to Nairobi was seven days. The average delay between transport of the specimen to Nairobi and return of the lab result to Juba was 16 days.

⁷¹ For another 45 percent of specimens, the results were returned 8 to 21 days after collection of the specimen. For the remaining 38 percent of specimens, the delay between collection and return of results exceeded 21 days.

⁷² Mr. Julu of WHO explained that feedback of lab results from Nairobi is difficult because the Nairobi lab often fails to include the unique identification code with the report of the result. If this is the case, then WHO/SS needs to communicate with the Nairobi lab to agree on an improved system for labeling and reporting on lab data.

⁷³ This includes 12 specimens for measles, 6 for jaundice, and 13 for anthrax. The evaluation team took photographs of the log book showing the missing feedback data.

The IDSR FY 2010 Revised Work Plan notes that “adequate funds shall be provided to secure central, state, and county contingency stocks of medicines, vaccines, and lab supplies and for the prepositioning of emergency stocks, particularly in epidemic prone States.” The evaluation team did not receive the documents required (i.e., a list of what supplies were distributed where and when) to adequately assess progress with this objective.⁷⁴

Four of six SSOs interviewed reported that drugs, vaccines, and/or personal protective equipment (e.g., face masks, gloves for outbreak investigators) had been pre-positioned at the state level to prepare for a possible future outbreak. This included cholera kits, IV fluids, and other essential supplies. Only one county (11 percent) reported prepositioning of any outbreak supplies (yellow fever vaccine).

3. Integration

IV. How have/are other disease surveillance programs being integrated into IDSR?⁷⁵

Key findings:

- Progress has been achieved with the adoption of an integrated system for weekly reporting of multiple diseases.
- IDSR training workshops and the Annual IDSR Review Meetings have incorporated sessions to promote integration.
- Experience with the Guinea Worm Eradication Program serves as an encouraging example of how a “vertical” disease-control initiative can contribute funding to pay for some IDSR field expenses.
- The persistence, and even expansion, of a parallel system for reporting of AFP (and now measles and neonatal tetanus) has coincided with a reduction in the reporting of vaccine-preventable infections on weekly reports. This could undermine confidence in the weekly reporting system. This finding demonstrates that the considerable resources at the disposal of the polio eradication program have yet to be adequately mobilized in support of IDSR.

Quarterly and annual project reports speak of gradual, but incomplete, progress addressing this issue.⁷⁶ Progress has been achieved with the adoption of an integrated system for weekly reporting of multiple

⁷⁴ The FY 2011 Q1 project reports notes that “health authorities and partners are well prepared to respond if there is any meningitis outbreak in the coming months. WHO already prepositioned laboratory supplies and drugs to high risk states and key health workers from referral facilities were trained on meningitis case management.” In addition, the FY 2010 annual report documents how WHO/South Sudan has been intensively engaged supporting case management of kala azar at select treatment centers.

⁷⁵ Question number 7 of the Scope of Work.

⁷⁶ For example, the FY 2010 annual report says that “Integration between IDSR and vertical surveillance programmes has made good progress, but more effort from Ministry of Health, WHO, and partners are needed to speed up the integration process”; The May 2009 assessment found that “due to the lack of a sustained IDSR committee, the participation of programs in IDSR activities has been suboptimal and hence most of the key priority diseases like Polio, Guinea worm, Tuberculosis and Leprosy are managed under well structured vertical programs. These programs have vital resources that could be used for surveillance of other priority diseases under the IDSR arrangement. A case in example is the Polio surveillance network which if integrated into the mainstream surveillance system can be used to meet the IDSR objectives. . . . The continued support of vertical programs such as AFP/Polio, and HIV/AIDS by WHO and other development partners was seen to have a negative impact on surveillance and control of other diseases such as measles, neonatal tetanus, meningitis, cholera etc. . . .” The report of the 2008 annual IDSR review meeting notes that, at that time, the

diseases. When asked to provide other examples of such progress with integration of surveillance, five of nine CSOs (55 percent) and five of six SSOs (83 percent) noted that the Guinea Worm Eradication Program was helping to pay for some IDSR field expenses.

On the other hand, only limited progress has been achieved with integrating IDSR with AFP surveillance. The polio eradication program employs a very sizeable workforce in South Sudan that is independent of the Ministry of Health and the IDSR program.⁷⁷ All of these staff could potentially support IDSR and, indeed, many of them have begun to report and investigate cases of measles and neonatal tetanus in addition to cases of AFP. However, there are signs that the expansion of the roles of the polio eradication staff has coincided with a reduction in the reporting of vaccine-preventable infections by “IDSR staff.” During the last four months, four of the six states visited by the evaluation team reported no cases of AFP on the weekly forms, but each reported several facility-based cases of AFP on the case forms completed by the polio eradication staff.⁷⁸ Likewise, during the last four months, no case of measles has been reported on a weekly IDSR form from Jonglei State during a period when numerous cases are being reported from neighboring Upper Nile State and the polio eradication staff of Upper Nile have begun to report measles cases from the north of Jonglei.⁷⁹

Are there regular coordination meetings at different levels of the system?

Key finding:

- If meetings take place, the proceedings are seldom captured with minutes.

SSOs and CSOs interviewed reported that there are regular meetings to support integration of disease surveillance in three of six states (50 percent) and four of nine counties (44 percent). Minutes from these meetings were available for two of six states (33 percent) and one of nine counties (11 percent).

Do IDSR trainings include strategies and approaches (including tools) for integrating various disease surveillance activities?

Key finding:

- IDSR trainings and annual review meetings have emphasized integration of surveillance efforts and included appropriate content.

A review of training materials and training reports shows that IDSR trainings appear to have indeed incorporated the relevant instruction on detection and investigation of AFP and measles cases. The agendas

Polio Eradication Program had 336 paid staff in addition to volunteer village “Contact People,” while the Guinea Worm Eradication Program had 1,604 paid staff in addition to 17,427 village volunteers.

⁷⁷ WHO’s national coordinator for polio eradication, Dr. Mustafa Yehia, notes that the program now employs 8 international focal points, 14 international STOP TB Partnerships consultants, 10 state medical officers, 39 field supervisors (at county level), and 227 assistants. In addition, the program supports a network of approximately 2,000 community-level informants. These staff have their own salaries, operating budgets (including fuel and communication allowances), and transport and communication equipment (e.g. Thuraya phones).

⁷⁸ More than a year has elapsed since any case of AFP was noted on a weekly form from CES. Only two cases have been noted on weekly forms from this state since January 2010. During this period, dozens of AFP cases have been reported by polio eradication staff on their case forms. Perhaps half of these cases have been community-based and thus not detectable at facility level. However, the remaining half of these cases have been facility-based and should have been noted on the weekly IDSR reports. WHO’s Medical Officer supporting polio eradication, Dr. Yehia, estimated that 60 percent of AFP cases in South Sudan have been detected at health facilities and 40 percent have come from community-based surveillance.

⁷⁹ Dr. Fazal, WHO International Focal Point in Malakal, Upper Nile.

of the Annual IDSR Review Meetings have likewise included sessions to promote integration of surveillance efforts. However, these interventions seem to have had very limited impact encouraging integration of IDSR and AFP surveillance (and surveillance for other vaccine-preventable infections) at the county level and below.

4. Capacity building

V. What key strategies is WHO using to build the necessary institutional capacity within the Ministry of Health to manage and run the disease surveillance and response program once the project ends?⁸⁰

Key findings:

- The government of South Sudan has demonstrated its commitment to IDSR by regularly paying the salaries of most State and County Surveillance Officers and health facility staff.
- Other than this, the financial contribution by the Ministry of Health to IDSR activities has been very limited.
- The EPR Division, the unit within the MoH responsible for IDSR, has only three staff.
- The EPR Task Force has not met for more than three months.
- WHO funds the salaries of an International Focal Points and National Focal Points in most states. In addition, it has paid for fuel, communication expenses, transport allowances, and salary top-ups for SSOs and select CSOs. Such funding has been essential to the progress so far achieved with weekly reporting.

As summarized in Annex 2 (“Summary of funding for surveillance activities from USAID and other donors”), IDSR activities have been co-financed by USAID (\$3,256,000 during 2009 to 2011) and ECHO (\$3,505,000 during 2009 to 2011). The FY 2010 project annual report notes that the “financial contribution by the Ministry of Health to the expansion and implementation of IDSR plan-of-action is very limited, and largely impacts the overall sustainability of project activities. . . .” and “. . . the operation of the SMOH entirely depends on the financial assistance from WHO state and IDSR support funds. This has a negative impact on the sustainability of activities, especially in the event WHO is no longer able to support response activities.” The national IDSR program staff, most of the State Surveillance Officers (five of six) and County Surveillance Officers (six of nine) told the evaluation team that they have received no funds from the RSS to pay for the operational costs of IDSR activities.

On the other hand, the RSS has made progress with payment of salaries to State and County Surveillance Officers and health facility staff. The evaluation team found that six of six State Surveillance Officers, six of nine County Surveillance Officers, and 29 of 38 (76 percent) health facility staff interviewed reported that they had been paid their monthly salary at least four times in the last six months.

State Surveillance Officers in the six states visited by the evaluation team reported that turnover of County Surveillance Officers had been a problem in from 0 percent (0 of 3 counties of WBEG) to 71 percent (5 of 7 counties of Warrap) of their counties (the mean was 34 percent of counties in the six states visited). WHO’s

⁸⁰ Question number 8 of the Scope of Work.

Quarter Two project report for FY 2011 notes that “retention of qualified and trained health personnel is becoming very challenging due to unpaid salary and availability of highly paid employment opportunities through UN and NGOs.”

Is there apparent and effective leadership from the MoH at the national, state, and county levels for the IDSR program? What evidence is there that the MoH “owns” the program?

The FY 2010 annual report notes that “implementation of the IDSR strategy at central, state, and county level has been very slow, mainly due to the delay in endorsing the IDSR strategy and plan of action by the Ministry of Health.”

As discussed in response to question five, the evaluation team found that EPR committees at national, state, and county levels were either inactive or not producing any written minutes or EPR plans. In most states visited, WHO staff appeared to be serving most basic surveillance functions (i.e., investigation of suspected outbreaks) apart from the management of the data from weekly reports. At the national level, the Division of EPR that has responsibility for the IDSR program is staffed only by a single Director and two Inspectors.⁸¹ This has major implications for MoH leadership of IDSR. Dr. Abdinasir M. Abubakar, the international Medical Officer/Epidemiologist coordinating WHO’s support for IDSR, noted that without such leadership WHO lacks the mandate to move forward with support for implementation of some key activities.⁸²

To what extent is WHO investing in recurrent costs (e.g., salaries/stipends) that will be difficult for the Ministry of Health to assume once the project ends?

The annual project budget from USAID includes \$175,000 for the salary of a WHO epidemiologist and four national public health officers. In addition, WHO receives roughly \$1 million per year from ECHO to employ field epidemiologists, a logistics officer, and “others.”

WHO financial support at state and county levels includes monthly supervision incentives for all State Surveillance Officers and some County Surveillance Officers. WHO has also been the principal source of funding for fuel and travel allowances to support collection of reports, outbreak investigation, and supervision conducted by State and County Surveillance Officers. Withdrawal of such support would likely have a major impact on not only the investigation of suspected outbreaks, but also the supervision of IDSR reporting and collection of weekly reports.

⁸¹ Director Dr. John Lagu is one of the 13 staff of the MoH trained in the Nairobi-based, USAID-financed Field Epidemiology Training Program long-term training program; Mr. Robert Gama manages the Excel-based national database of ISDR weekly reports as well as the national outbreak log. Dr. Tabo has recently been recruited from the malaria program to work in the EPR division; Dr. Lagu has requested that one of the Inspectors in his Division be designated a Deputy Director and that a second Deputy Director be recruited.

⁸² For example, printing and dissemination of the national guidelines for outbreak investigation.

5. Effectiveness of the overall project—Part II

VI. Are IDSR data used for decision-making? If so, how?⁸³

Key findings:

- The evaluation team found no evidence of analysis of data (e.g., graphs or data tables) at county health departments, and very limited evidence of analysis at most state surveillance offices.
- Quarterly and annual reports of the project described a small number of public health actions that had been informed by findings of the IDSR system.
- The IDSR system provides very limited feedback to health staff at state, county, and facility levels.
- The principal means of providing feedback, the weekly surveillance bulletin, typically presents a simple tabulation of raw data without attack rates, disease trends, analyses by age, analyses of geographical distribution, or public health messages.

Unless surveillance data are demonstrably useful to decision-makers at local (e.g., household and facility) as well as national (e.g., politicians) and international (i.e., donor) levels, support for the tedious and expensive process of data collection will likely falter.⁸⁴ The FY 2011 Q1 report notes that “although tangible progress has been made on data management and analysis, utilization of the surveillance information for action is very limited.”

To be made useful, data must first be analyzed and presented. Yet very little evidence of any type of analysis was observed by the evaluation team in the health facilities, CHDs, or SMoH surveillance offices visited.⁸⁵ Detailed findings from the current evaluation are presented in Table 15.

Table 15: Types of analysis observed at state, county, and facility level

Analysis/level	SMoH (n=6)		County (n=9)		Health facility (n=38)	
	#	%	#	%	#	%
Analysis of trend (graph)	4	67%	0	0%	3	8%
Analysis by place (map)	2	33%	0	0%	2	5%
Analysis by age or sex	3	50%	0	0%	2	5%

⁸³ Question number 6 of the Scope of Work.

⁸⁴ This appears to be what has happened with the completeness of weekly reporting during 2011.

⁸⁵ The May 2009 assessment “. . . observed that there is very little data analysis in all health facilities . . . Analyzed data were observed on the walls or notice boards of only 5 percent of facilities. . . case fatality rates were observed at only 3 percent of facilities. . . Demographic data was observed at only 8 percent of facilities.” Only one of 14 counties had data analyzed by time, only two had data described by place, and only two had data described by person. “Data analysis indicators were also at a very low level, implying that there is no analysis done at county level . . .”

Known catchment population (for rates)	4	67%	4	44%	13	34%
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Various project documents provide some evidence of the utility of IDSR data. These are presented in Annex 10. There are instances where:

- A disease outbreak (e.g., measles, kala azar, anthrax) was detected and confirmed through IDSR mechanisms, and the health system mounted a timely and effective response (e.g., supplemental immunization, improved treatment, health education) that was informed by IDSR data;
- Resources were conserved and distraction/panic were avoided when the IDSR system confirmed that the situation (e.g., suspected meningitis, suspected cholera, suspected yellow fever) was under control and did not require emergency measures; and
- IDSR data called attention to an endemic disease (such as malaria) and were used to advocate and plan for improved resources to combat it.

To maintain complete, timely, and accurate reporting by “lower” levels, it is essential that “higher” levels provide feedback—user-friendly summaries of key findings, including measurements of the completeness and timeliness of routine surveillance reporting.⁸⁶ The FY 2010 annual report of the IDSR project notes that “in the past one year, the quality and frequency of producing and disseminating weekly surveillance bulletins to all health authorities and health partners have drastically improved.” Electronic copies of Weekly Epidemiological Bulletins were observed in five of the six SMoH surveillance offices. This was the only written feedback on surveillance findings that the evaluation team observed to have come from the national to the state level.

The main purpose of the epidemiological bulletin is to generate timely and reliable information for decision-making in the country. Based upon a review of a sample of bulletins provided by staff of the EPR Division, the evaluation team found that the current bulletin presents a simple tabulation of raw data, with many blank fields, no disease trends, no analyses by age, no analyses of geographical distribution of diseases, no estimate of populations at risk, and hence no attack rates. The bulletin typically does not report on any indicators, nor does it include any public health messages on how to improve the health of the South Sudan population. Some issues of the bulletin report on the timeliness of reporting without explaining how this has been defined or measured.

Only one of nine CHDs (11 percent) visited reported that it had received any written feedback from the state or national level regarding its surveillance reports. In addition to the limited written feedback provided by IDSR staff at various levels, the Annual IDSR Review Meetings have provided a good opportunity to present and discuss surveillance findings.

⁸⁶ The report of the May 2009 assessment notes that “feedback . . . [is] not yet developed.” Only 2 percent of facilities had received any written feedback report in the past 12 months. Only 7 percent of counties had received feedback from the national level on their weekly report.

VII. What are the MoH, other donor, and stakeholder impressions of the program?⁸⁷

Key findings:

- Some key agencies working in South Sudan are not even aware of the IDSR program or the EPR Task Force;
- Several key informants suggested that NGOs and the Health Cluster, rather than the IDSR system of the Ministry of Health, now provide the most important mechanisms for alerting national health authorities about suspected outbreaks;
- Representatives of various agencies, including the Ministry of Health, were concerned about the motivation and capacity of State and County Surveillance Officers to perform their jobs; and
- Yet, several informants felt that the best way to strengthen implementation of IDSR is to build the surveillance capacities of State Ministries of Health and County Health Departments.

Discussions with key stakeholders focused on two questions:

1. What should be done to strengthen capacity at national and sub-national levels for integrated disease surveillance and response?
2. Please describe how suspected outbreaks are now reported in South Sudan.

Commenting upon the weak capacity and performance of SSOs and CSOs, a health advisor with UNICEF noted that such problems affect numerous other MoH programs. The advisor suggested that the key to improving performance was to strengthen motivation and accountability: “If you don’t deliver [as a member of the AFP team], then you go.”

Several polio eradication staff at the state and national levels expressed significant concerns about the motivation of most SSOs and CSOs, but they insisted that the polio eradication program was willing and able to work with government staff to form effective teams and build capacity at state and county levels.

A senior MoH official expressed skepticism about the basic qualifications of most CSOs and SSOs. This official suggested that the best way to build the capacity of the Ministry of Health to support disease surveillance and response would be to resume long-term training abroad. “If the project had provided such high-level training to two to three people per state, then we could lead the program.”

A health advisor for the Joint Donor Team and the WHO’s Medical Officer supporting IDSR both commented that it was unlikely that the government of the RSS would agree to a significant increase in the staffing of the EPR Division of the national MoH. Both of these experts suggested that the way forward was to build capacity at state level.

⁸⁷ Question number 3 of the Scope of Work.

One informant who was familiar with the history of efforts to develop IDSR over the last five years noted that “IDSR needs a champion” within the government of RSS, and that “IDSR may be an orphan now.”

Informants with the UN Office for the Coordination of Humanitarian Affairs who are responsible for coordinating Emergency Preparedness and Response were not aware of the IDSR program or of the EPR Task Force. They suggested that suspected disease outbreaks were now reported by various NGO partners and discussed at Health Cluster meetings at the state and national level.

Two of the three NGO officials interviewed were aware of the IDSR system, but they also suggested that most suspected outbreaks were reported by NGO staff. This was echoed by a well-informed official within the Ministry of Health.

VIII. What, if any, are major overall shortcomings that should be addressed for effective project implementation?⁸⁸

Various major shortcomings have already been identified and the relevant findings discussed. These will be summarized in the Conclusions. This section will comment only on one additional major shortcoming of the project—the need to expand community-based surveillance.

What plans are there to expand community-based surveillance in South Sudan?

Key findings:

- To date, the IDSR project has relied almost exclusively upon facility-based surveillance.
- A network of active community-based informants is needed to improve the sensitivity and timeliness of surveillance for the diseases monitored by IDSR.
- Informants testified that a limited form of integrated disease surveillance could realistically be added to the responsibilities of existing community-based volunteers.
- MoH and WHO officials responsible for national coordination of IDSR have proposed to develop a protocol for community-based surveillance.

Access to health facilities in South Sudan is quite limited. This has major implications for the timeliness, sensitivity, and representativeness of facility-based surveillance. This is why WHO and others (particularly the polio eradication program and the guinea worm eradication program) have been training community-based volunteers in surveillance.⁸⁹ Informants at all levels and from various programs and institutions (including the polio eradication program) informed the evaluation team that it is realistic to add integrated disease

⁸⁸ Question number 2 of the Scope of Work.

⁸⁹ Dr. Yehia, who supports polio eradication activities at the national level, estimated that 60 percent of AFP cases were detected at facility level and the other 40 percent of AFP cases were reported by community informants; This is probably also why the Basic Package of Health and Nutrition Services specifies that volunteer home health promoters are to be responsible for “. . . (v) enumerating cases and keeping surveillance and notification of disease, (vi) alertness to unusually high rate of any type of illness to provide early warning signals of outbreaks of epidemic diseases.”

surveillance to the other responsibilities of polio eradication, guinea worm eradication and other community-based volunteers (e.g., home health promoters). All five states and all of the nine counties visited reported mobilization of communities to report diseases and respond to disease outbreaks. This was done largely through training of volunteers, giving health education, and sensitizing community leaders.⁹⁰

One of the recommendations from the 2011 Annual IDSR Review Meeting was to “finalize the community based surveillance protocol by July 2011.” The evaluation team asked about this draft protocol, but found that it was not yet available for review.

⁹⁰ The key persons at community level trained for this function were mainly AFP volunteers, reported by 66.7 percent of states and 55.6 percent of counties, followed by guinea worm volunteers, reported by 60 percent of states and 22.2 percent of counties visited; The evaluation team observed specific plans and budgets for community-based surveillance in only one out of the five states it visited, and none in all the nine counties seen; Regarding reports of rumors of suspected outbreaks from communities, all the states and counties visited confirmed that communities report rumors of suspected outbreaks. Most of the rumors were reported to come from village health committees, followed by AFP volunteers and guinea worm volunteers. A good proportion of state respondents said they respond to these rumors by going to the community to verify 50 percent (3/6), and investigate 33.3 percent (2/6), while respondents at county level only verify the suspected rumors from communities. We observed no written documentation where rumors of suspected outbreaks were recorded at state level, but 37.5 percent of counties had written documentation.

CONCLUSIONS

IX. What are the critical lessons learned from the program experience to date?⁹¹

From 2009 to 2011, the IDSR project made significant progress with development and dissemination of integrated reporting tools, recruitment of State and County Surveillance Officers, training of large numbers of primary health care staff, and distribution of communication and transport equipment. The percentage of health facilities submitting weekly reports has increased from less than 20 percent to more than 40 percent. These are the sorts of input, process, and output indicators that have been used to date to monitor the effectiveness of the IDSR project.

The IDSR project has deployed surveillance officers to all states and to 71 of 80 counties. However, most State and County Surveillance Officers have received only brief training in disease surveillance and response, and some stakeholders question their motivation and basic qualifications.

WHO has worked with the MoH to develop an appropriate range of reporting forms and job aides, and most of these adequately serve the needs of the surveillance program. Some of the case definitions are overly complex, and the standard outbreak log does not capture all essential information. Reporting tools and case definitions cannot be read by the large number of health workers who are literate only in Arabic. Dissemination of the IDSR tools is still incomplete: up to half of health facilities have not yet received the reporting forms or no longer have them in stock.

The project has provided brief IDSR training to a large number of primary health workers. Due to the incompleteness of training documentation, it is unclear what training methodologies were employed, and it is not possible to reliably estimate what percentage of health facilities have been reached. However, the limited evidence suggests that as many as half of health facilities have no one trained in IDSR. Interviews with health workers suggest that the trainings resulted in only limited improvements in IDSR knowledge.

While the project has endorsed a checklist for surveillance officers to supervise IDSR activities at health facilities, little appears to have been done to promote its use. Meanwhile, an opportunity is being missed to integrate supervision of IDSR into the broader and better-supported supervisory approach being promoted by several NGOs.

A foundation has been laid in most counties for weekly reporting from a significant percentage of health facilities. The completeness of reporting rose significantly in 2010 but has plateaued for the last 12 months. About a quarter of health facilities regularly submit weekly reports; another quarter report at least 50 percent of weeks; another quarter report infrequently; and a quarter of health facilities do not report at all. There are eight counties (including six of 13 counties in Upper Nile State) where no health facilities have ever reported or only one health facility has very infrequently reported. Thus, the national surveillance system has some

⁹¹ Question number 9 of the Scope of Work.

significant “blind spots” where outbreaks could persist and spread before coming to the attention of health authorities. There is a risk that the size of these blind spots would increase if, as some have suggested, IDSR focused most of its attention on sentinel surveillance sites.

Most State and County Surveillance Officers are not doing enough to monitor reporting by health facilities. In fact, apart from some individual efforts in a couple of states, they do not monitor at all the *timeliness* of reporting. This is not acceptable.

The motorcycles and bicycles supplied by the project are highly valued by most SSOs and CSOs, and they have likely contributed significantly to the completeness and timeliness of reporting. However, as many as half of states and counties have not been using Codan HF radios and Thuraya satellite telephones to assist with weekly reporting.

Neither CSOs nor SSOs routinely produce any reports of their own (e.g., monthly summary reports). Their work is largely limited to the collection and transmission of data to a higher level, without any form of analysis or comment. As a result, most County and State Surveillance Officers do not adequately review the weekly IDSR data, and a significant number of possible outbreaks or errors in the data are going undetected.

Contrary to national IDSR guidelines, SSOs and CSOs complete very few case investigation forms and line listings. This severely limits the information available for investigation of suspected outbreaks. WHO has well-qualified staff at the state level who (with few exceptions) have demonstrated a willingness and a capacity to work with State and County Surveillance Officers to support IDSR activities, including the investigation of suspected outbreaks. The absence or incompleteness of key documentation (e.g., outbreak logs, case investigation reports) at most state and county surveillance offices suggests that, with few exceptions, it is these WHO staff, and not the State and County Surveillance Officers, who have been active with outbreak investigations.

It remains the case that laboratory specimens must be sent to Nairobi to confirm diseases of epidemic potential. The delay in return of laboratory results to Juba—an average of three weeks—is not compatible with timely detection and correct response to outbreaks. In many instances, there is an even longer delay in feedback of the results to state and lower levels. This is not acceptable. Meanwhile, hopes are high within the MoH and WHO that a national public health laboratory may be opened in Juba in the coming year. Significant time and support will be required, however, before this new institution can meet most of the needs for laboratory confirmation.

The rollout of the DHIS system to all 10 states (eventually to replace the current IDSR Excel spreadsheets) holds promise for improving the entry, error checking, analysis, and reporting of IDSR data. For DHIS to manage case-based data, however, technical assistance will be required to further customize the software.

The IDSR project has achieved progress with the adoption of an integrated system for weekly reporting of multiple diseases. IDSR training workshops and Annual IDSR Review Meetings have promoted integration of surveillance activities and, as a result, some “vertical” disease-control initiatives (e.g., the Guinea Worm Eradication Program) now help fund IDSR field expenses. However, the persistence, and even expansion, of

a parallel system for reporting of AFP (and now measles and neonatal tetanus) has coincided with a reduction in the reporting of vaccine-preventable infections on weekly IDSR reports. This threatens to undermine confidence in the IDSR weekly reporting system. Yet, from their discussions with key informants at national and state levels, the authors of this evaluation are persuaded that Polio Eradication Initiative (PEI) staff have both the capacity and the willingness to work more closely with IDSR. Such collaboration would benefit PEI as well as IDSR.

The government of South Sudan has demonstrated some commitment to IDSR by regularly paying the salaries of most State and County Surveillance Officers. However, the Ministry of Health (at national as well as state levels) pays for very few running costs, and the EPR Division of the national MoH lacks the staff to effectively lead the program. The failure of the EPR Task Force to meet for more than three months makes leadership even more tenuous.

Based upon the recommendations of key informants, and taking into account policy constraints to strengthening capacity at national level, the evaluation team concludes that the best way to strengthen implementation of IDSR is to build the surveillance capacities of State Ministries of Health and County Health Departments. WHO's staff at the state level, including those supporting polio eradication, are key to building such decentralized capacity.

The evaluation concludes that further progress with IDSR implementation depends upon successful completion in the next year of a large number of important developmental tasks, discussed below in the Recommendations section. While some of these tasks might best be completed at the initiative of WHO in concert with the MoH, the evaluation team concludes, given the number of issues to be addressed, that WHO would benefit from technical support recruited by USAID and/or ECHO.

RECOMMENDATIONS⁹²

What adjustments to the current program may be necessary?

What key issues should USAID consider for the final year of the project?

What key issues should USAID consider looking beyond the life of the project?

Recommendations for USAID:⁹³

1. USAID should monitor an expanded set of indicators. Annex 12 suggests a balanced set (ST).

⁹² Question number 10 of the Scope of Work.

⁹³ Short-term steps to be completed in the next few months are indicated below as "ST." Intermediate-term measures are indicated as "IT."

2. USAID and/or ECHO should recruit a short-term consultant with expertise and experience in the design and implementation of communicable disease surveillance systems in developing countries to work with the Ministry of Health and WHO staff in South Sudan to strengthen implementation of the country's IDSR program. Annex 11 suggests a detailed scope of work for this consultancy (ST).
3. USAID and/or ECHO should recruit a short-term consultant to help customize the DHIS software for South Sudan so that it can manage case-based records, reliably validate surveillance data as they are entered, and automatically generate reports on the indicators of most interest (ST).
4. USAID, ECHO, and WHO should participate in efforts by the MoH to develop an officially endorsed strategic plan for IDSR (IT).

Recommendations for the national Ministry of Health:

1. The MoH should urgently assign at least one (and maybe two) additional technical staff to the EPR Division of the national MoH (ST).
2. The MoH and partners should urgently reactivate the EPR Task Force at the national level (ST).
3. The MoH should update and officially endorse the strategic plan for IDSR (IT), as well as other important disease surveillance documents such as the outbreak investigation guidelines and specific EPR plans for cholera, meningitis, hemorrhagic fever, and other key diseases of epidemic potential (ST).
4. The MoH should produce an annual work plan and budget for IDSR, specifying the contributions of the government of RSS and various partners (IT).
5. The MoH at central and state levels should allocate resources to support outbreak investigation and response activities (IT).
6. The MoH should open the national public health laboratory with the full complement of required staff. (IT)
7. The MoH should mobilize partner (including NGO) support for dissemination of the monthly reporting format that has been endorsed by its M&E Division (ST). IDSR proponents with the MoH and WHO should provide input into the design of the next version of this official monthly reporting format so that it better meets the needs for disease surveillance (IT).

Recommendations for WHO in concert with the national and/or state Ministries of Health:

1. WHO and the MoH should monitor and report on an expanded set of indicators. Annex 12 suggests a balanced set (ST).
2. WHO should monitor efforts by its staff at the state level to build the capacity of State and County Surveillance Officers and integrate disease surveillance. These WHO staff should report regularly on such capacity building and integration, and should be held accountable for achieving progress with these objectives. In this way, WHO staff should work with State Ministries of Health and CHDs to assure that SSOs and CSOs fulfill the following key responsibilities (ST):
 - a. Monitoring of the timeliness of weekly reporting by health facilities;
 - b. Correct completion of case investigation forms, line listings, case investigation reports, and the outbreak log according to national IDSR guidelines;
 - c. Regular review and analysis of the aggregate and case-based IDSR data to identify and investigate suspected outbreaks and summarize the findings in a regular monthly report from each SSO and CSO;
 - d. Regular dissemination to CHDs and health facilities of written feedback on surveillance findings; and
 - e. Regular (e.g., biannual) visitation of all CHDs (by SSOs) and the majority of functioning health facilities (by CSOs) to supervise IDSR work and document the supervision by completing an IDSR supervisory checklist.
3. WHO staff at the state level, in concert with the SSOs and CSOs, should convene regular (at least monthly) meetings at state and county levels of surveillance staff (including those for AFP surveillance, guinea worm surveillance, etc.) to develop joint work plans and develop joint approaches to supporting surveillance (ST).
4. The IDSR case definitions should be reviewed and, where possible, further simplified (IT).
5. Arabic-language versions of the case definitions and other key job aides should be officially endorsed, printed, and widely distributed (ST).
6. The MoH, WHO, and partners should support a course of at least one-month duration for advanced training of State and County Surveillance Officers (IT).
7. The national surveillance bulletin should be enhanced to include more examples of disease trends, analyses of the available case-based data, analyses by age, analyses of the geographical distribution of diseases, estimates of attack rates, and case fatality rates. With such enhancements, including discussions of related public health interventions, the bulletin will be of greater relevance to readers and will help develop their technical capacity and support for IDSR (ST).

8. WHO and the Ministry of Health should design and disseminate to all SSOs and CSOs an improved standard outbreak log and written guidance on its use. This should include a system for synchronizing the information contained in the outbreak logs of different sites (i.e., information should be shared between a log at state level and a log at national level based upon the unique identifier assigned to each index case) (ST).
9. WHO, in concert with State Ministries of Health, should take an inventory of the location and disposition (i.e., is the equipment functional and being actively used?) of all IDSR communication equipment that has been distributed. Surplus IDSR equipment should then be redistributed from sites where it is not being used to sites where it is needed (ST).
10. Plans for expansion of community-based surveillance should be finalized and shared with partners. The approach should build upon existing community-based resources and activities (IT).

Recommendations for WHO:

1. WHO should recruit one or more short-term consultants to develop and field-test a training plan and a training manual for primary health workers. The training plan should specify the geographic focus, the preferred qualifications of health workers, and the number of health workers to be trained per health facility. The training manual should specify in detail the lesson plans, training methodologies, and training materials (e.g., practical exercises, job aides to be given to participants, post-tests) to be used for IDSR training of health workers with limited literacy and limited learning skills. These tasks should be completed before conducting any further IDSR training of primary health workers (ST).
2. WHO should field-test the existing IDSR supervisory checklists to assure that they provide for a practical and effective supervisory approach (i.e., one that SSOs and CSOs can and will sustain with a minimum of external support and oversight). WHO should also encourage various lead agencies working in South Sudan (e.g., IMA in Jonglei and Upper Nile States, NPA in CES and EES) to incorporate into their integrated supervisory checklists one or two well-worded items to assess IDSR activities (e.g., “Count the number of weekly IDSR reports completed during the previous month”) (ST).
3. WHO should print and distribute the weekly reporting booklets in sufficient quantities to assure that they are kept in stock at all functional health facilities (ST).
4. WHO should design and rigorously implement a system for assigning a unique identifier to each case investigation form and lab specimen and assuring that this unique identifier is transmitted and preserved whenever information on a case, or the lab specimen or a lab result, is transmitted (ST).
5. WHO should investigate the reasons for the prolonged delays in the return of laboratory results from Nairobi and the feedback of these results to state level. WHO should then take measures to expedite these processes (ST).

6. WHO should design and implement an IDSR training database and a system for compiling from each IDSR training workshop the names of participants, their qualifications, and the name and location of the health facility where they work (SI).

7. WHO and other agencies or donors should support the opening of the national public health laboratory and the training of its staff (II).

ANNEXES

Annex I: Scope of Work

Mid-term Program Evaluation of Integrated Disease Surveillance and Response (IDSR) Project, implemented by the World Health Organization (Proposed Timeframe: mid-Sept 2011—end Oct 2011)

1. Program Details

Program Identification:

Name: Integrated Disease Surveillance and Response Program

Contracting Vehicle: Field Support from Mission in Central Agreement WHO/Consolidated Grant, GHA-G-00-09-00003

Program Funding:

2008: \$800,000 (MCH)

2009: \$ 1,100,000 (Other Public Health Threat)

2010: \$ 1,356,000:

- \$ 449,000 (Malaria)
- \$707,000 (MCH)
- \$200,000 (Other Public Health Threat)

Grant Total: \$3,256,000

Program Beginning/End Dates: October 1, 2008-Sept 30, 2013,

Key Agreement/Contract Modifications: Consolidated Grant, Amendment-1

Implementing Partners(s): World Health Organization

2. Evaluation Rationale and Type

The IDSR project is just past its half way mark in the program’s lifecycle. USAID Sudan typically undertakes an assessment of the effectiveness of the implementation of a project at this point in time. Therefore, a collaborative mid-term evaluation is being carried out for the IDSR project.

3. Background:

A. Country Context

Sudan is the largest country in Africa, borders nine countries, and has a population estimated at 40 million. Since independence in 1956, Sudan has suffered from civil war, with only a decade of troubled peace from 1972 to 1983.

Southern Sudan and the critical border areas (consisting of the northern states of Southern Kordofan and Blue Nile, plus Abyei—a commonly referred to as the Three Areas) are characterized by years of underdevelopment, war, famine, drought and flood, producing a crisis of enormous proportions across the region and resulting in the devastation of economic, political and social structures. In addition to the loss of lives, opportunities and infrastructure, the war displaced families and divided communities. In consequence, the health, education and infrastructure status of the Sudanese people are among the poorest globally.

After decades of civil war, Sudan’s warring parties signed a Comprehensive Peace Agreement (CPA) in January of 2005. Since that time the country has taken steps toward peace, reconciliation and good governance, although the pace has been slower than expected or desired.

Despite the signing of the CPA, Sudan remains a vulnerable state. Its children, many of whom are orphans, returning refugees and ex-combatants, are particularly at risk—especially in the volatile north/south border areas. It is essential that displaced and other affected people, including orphans and ex-combatant youth, be safely reintegrated into their communities. In the case of the youth, affected by the many conflicts and tensions during the past 21 years, the provision of basic education is critical to providing a solid foundation upon which their future success and contribution to society can be based. The provision of education can also be seen as a tangible result of the “peace dividends” expected by Sudanese citizens and, in turn, will contribute to stabilization in the region. Durable stability is contingent upon demonstrative and observable change “on the ground” and education, highly valued by the Sudanese, is both a necessary and visible symbol of that change.

In many areas, primary health and education services have been almost exclusively externally funded. Non-governmental organizations (NGOs), faith-based organizations (FBOs), and multilateral and

bilateral aid agencies offering humanitarian relief became the prime providers of an array of much needed services. As peace is consolidated, USAID will continue to support a responsible transition from emergency to development assistance that seeks to improve access to and quality of basic education. Education and health activities are reinforced by investment in other essential services, such as water and sanitation, in an effort to rebuild local communities, reduce tensions, and provide the much sought-after peace dividends.

B. Sector Context

Human development statistics rank southern Sudan among the very lowest in the world for maternal and child health, family planning and reproductive health, infectious diseases, and access to safe water. Less than one-third of the population has access to basic health services. Specific challenges include outbreaks of epidemic infectious diseases; lack of gender awareness in the provision and delivery of health services; shortages of qualified health personnel and poor physical infrastructure; inadequate supplies of drugs and medical equipment; unsatisfactory provision of health registers and training in record management and data collection, analysis, and feedback; insufficient sustainable safe water supply and sanitation in communities; and lack of adequate and dependable funding for health providers, infrastructure, and supplies.

RoSS is committed to achieving health policy and strategic objectives that include an integrated Basic Package of Health Services; strengthened health logistics, financial management; health management information; and human resources systems; decentralized health program management and implementation; and accessible, equitable, quality, and affordable health care. Policies meeting international standards have been promulgated in most of the health technical areas.

The Ministry of Health (MOH) in consultation and participation with key donor stakeholders is preparing the Health Sector Development Plan 2011–2015 (HSDP) to guide health sector development in southern Sudan. The plan operationalizes the Health Policy (2007–2011) and the Basic Package of Health Services (BPHS). The overall goal of the health sector in southern Sudan is to improve the health status of the population through the provision of effective, efficient and equitable health care services. The objectives of HSDP are: to increase community health seeking behavior; to increase utilization of health services; and to improve efficiency and effectiveness of the health system.

The Ministry of Health (MoH) and South Sudan AIDS Commission (SSAC) have assumed increasing responsibility for the public health system. Despite inheriting a disjointed and poorly coordinated health sector, the government has fully mapped health infrastructure, developed a national disease profile including the health and HIV status of the population and introduced a Monitoring and Evaluation framework with core indicators. MoH and SSAC are now better able to target resources to areas of need.

Despite these efforts, Southern Sudan has been experiencing recurrent outbreaks of epidemic prone-diseases, resulting in a negative impact on socio-economic and public health indicators for a population that not only suffers from severe poverty (over 90% live on less than a dollar a day) but also from over two decades of civil war and political instability. A high burden of communicable diseases such as Cholera, Malaria, Measles, Viral Hemorrhagic Fever, Rift Valley Fever, Meningitis, Leishmaniasis, Hepatitis E and Avian Influenza among others have posed a major public health challenge and straining on the nascent health system and institutions.

C. Program Description

Integrated Disease Surveillance and Response (IDSR), a strategy developed by the World Health Organization Regional Office for Africa, has been adopted in many countries in Africa. The IDSR strategy links communities, health facilities, district, regional, and national levels in designing and implementing public health interventions for the control and prevention of communicable diseases. Monitoring and evaluating the performance of the surveillance system, using several indicators, is important for the effective implementation of the strategy. Surveillance data are collected, analyzed, and interpreted on a weekly, monthly, or quarterly basis and the data are used for priority setting, policy decisions, planning, implementation, resource mobilization and allocation. A surveillance system can also be used for monitoring, evaluation and improvement of disease prevention and control programs. Disease surveillance is thus a critical component of the health system since it provides essential information for optimal health care delivery and a cost-effective health strategy⁹⁴.

The Ministry of Health in collaboration with donors and health partners is working on integrating various surveillance activities into one system within the broader national health management information system. In the past few years, significant progress has been made on building the core capacity of integrated communicable disease surveillance but still some surveillance activities are supported and managed by different vertical disease control programs. In 2006 Southern Sudan, adopted WHO/AFRO strategy of integrated disease surveillance and response (IDSR), which emphasizes that epidemic prone and other priority diseases are reported using a common approach. The activity is funded by USAID Sudan through the central-level global project, the WHO Consolidated Grant.

Initially, USAID supported the MOH/GoSS to establish the community-based disease surveillance network in Southern Sudan started in 2005 through CDC as a component of the Sudan Health Transformation Project (SHTP-1). The main objective of this project was to strengthen both institutional and human resource capacity of by then Secretariat of Health (now MOH/GoSS) and County Health Departments (CHDs) on planning, support- supervision, and to establish functioning disease surveillance and response system.

This project was to be implemented over a 3 year period, with the specific objective of training 20 County Medical Officers from 20 County Health Departments. The aim was to achieve, at the end of 3 year period, a functional, effective and sustainable disease surveillance system, and the enhanced capacity to effectively detect and respond to outbreaks and epidemic-prone diseases. In 2006, CDC persuaded the MOH/GoSS to change the project goal and objectives to focus on long term graduate training course known as Field Epidemiology Laboratory Training Program (FELTP) in Kenya. Through this project, only eight public health master's degree holders were trained but the community-based surveillance network was not developed. In 2008, USAID changed the implementing partner and funded WHO to implement IDSR in all Southern Sudan counties.

Nonetheless, the progress and expansion of the IDSR system are faced with huge implementation constraints which include; weak health infrastructure and system, shortage of trained personnel, weak surveillance structures for timely detection and reporting, poor documentation, inadequate support

⁹⁴ WHO Mediterranean Zoonosis Control Center, 50, 2000

supervision, weak laboratory capacity, and other support functions. In 2008–2010, USAID supported expansion of the IDSR strategy to 51 counties in all 10 states, this strategy will be extended to additional 29 counties as well as some of the high risk communities in FY 2011 & 2012. Therefore, the MOH (GoSS and State) still requires continuous technical and financial support to complete the expansion of IDSR into remaining counties and local communities through capacity building of health workers, improved communication and transport infrastructure and strengthening laboratory capacity. Brief descriptions of the project’s core activities follow.

1. Capacity Building and Technical Assistance

Considering the severe shortage of trained health workers in all levels of the health system, appropriate trainings of front line health workers on integrated surveillance approach is a critical activity. Strengthening the capacity of County Surveillance Officers is one of the main components of the project. In 2008–2010, USAID supported training of over 1,500 health workers on IDSR. The IDSR trainings incorporate all aspects of disease surveillance, laboratory diagnosis, epidemic preparedness and response (EPR), monitoring and supervision, and data management. Training in laboratory techniques is also included, focusing on an integrated multi-disease approach where the same or similar techniques are used to diagnose various diseases.

Furthermore, short-term training courses of 2–3 months in the field of epidemiology have been planned for mid-level health managers and surveillance officers at central, state and county level in collaboration with Juba University. This activity will be implemented in the second half of 2011.

2. Information Communication Technology (ICT)

Enabling communication of surveillance data from the periphery to the county, state and central level and thereafter to the international level and back to the periphery is a second essential component of the IDSR project. The project focuses on the following minimum communication: (a) from the most peripheral village or primary health unit (PHCU) to the primary health centers (PHCC) through direct delivery of information; (b) from PHCC to county by HF radio, telephone, or direct delivery; (c) from county to state by telephone, radio, e-mail, or direct delivery; (d) from state to central level by telephone, radio, e-mail, or direct delivery; (e) from national level to international agencies by e-mail, telephone, etc. In FY10, Ministry of Health decided to install HF radio for referral hospitals, which enabled the surveillance officers to transmit the data on a daily and weekly basis to the state and central level. In 2009–2010, USAID supported procurement and distribution of VHF radios and Thuraya satellite phones to county surveillance officers and referral hospitals to strengthen effective communication and facilitate prompt reporting.

3. Transportation

The third core IDSR implementation strategy is to provide minimum available transportation to county surveillance officers and Payam focal points to enhance rapid investigation and response of any disease

outbreaks alerts. Therefore, USAID supported procurement and distribution of motorcycles and bicycles at the Payam and county levels and spare parts are provided when requested.

4. Support Supervision and Outbreak Investigation

As part of their training, State and County surveillance officers are given training in how to conduct supportive supervision and are subsequently required to conduct supervisory visits to monitor the surveillance activities at Payam and community levels on quarterly basis.

The IDSR project provides support to rapid response teams by equipping them with adequate resources and logistics for rapid intervention at State and County levels. The project provides funds to secure Central, State and County contingency stocks of medicines, vaccines and lab supplies, and for the prepositioning of emergency stocks, particularly in epidemic prone States. Support for rapid outbreak investigation and public health laboratory services is provided at Central and State levels. The IDSR project has provided training to MOH laboratory staff on laboratory standard operational procedures, outbreak investigation, safe transportation of specimens, and reporting. IDSR also supports the MOH with regular vaccines lab equipment and supplies as well as outbreaks personal protective equipment. WHO has three full time IDSR staff in Juba: An Activity Coordinator, a Field Epidemiologist, and a Data Manager.

D. Linkage to USAID Sudan Strategy and USG Foreign Assistance Framework

The underlying hypothesis of the IDSR program is that by providing the inputs (training, equipment and supervision) to the Ministry of Health to implement a disease surveillance and response program, the Ministry will have expanded capability to control the outbreak of epidemic prone diseases. The IDSR project contributes to the achievement of Development Objective 3—Essential Services Developed and Sustained. Under the Foreign Assistance Framework, IDSR falls under the Investing in People objective.

E. Geographic Orientation

The table below indicates the State/ County coverage from 2008–2010 and planned coverage in 2011.

Coverage of IDSR programs (training and equipment 2008–2010)

State/ County	2008–2010 Coverage	2011 Planned Coverage
CES	Terekeka, Juba, Lainya, Yei, Kajo-Keji	Morobo
EES	All counties. Magwi, Torit, Lopa, Ikotos, Budi, Kapoeta South, Kapoeta North,	
WES	Ezo, Nzara, Yambio, Ibba, Maridi, Mvolo, Mundri West, Mundri East	Tambura, Nagero
Lakes	Wulu	Cueibet, Rumbek North, Rumbek Centre, Rumbek East, Yirol West,

		Yirol East
Jonglei	Fangak, Canal, Ayod, Twic East, Bor South, Pochalla	
NBeG	Aweil North, Aweil West, Aweil East, Aweil South,	Aweil Center
WBeG	All Counties. Raga, Wau, Jur River	
Unity	Pariang, Rubkona, Guit, Mayendit	Abiemnhom, Mayom, Koch, Leer, Panyijar
Upper Nile	Malakal	Oabyikang, Fashoda, Manyo, Baliet, Melut, Renk, Maban, Longochuk, Maiwut, Ulang, Luakpini/Nasir
Warrap	Gogrial West, Twic, Gogrial East, Tonj North, Tonj South	Tonj East

Annex One shows which states and counties the IDSR project provided (and will provide) training to during 2008/2009, 2009/2010, and 2010/2011. Annex Two shows which states and counties were provided with equipment through the project during the same years.

4. Available Information to Support the Evaluation

1. WHO IDSR initial SOW (2008)
2. Annual work-plans from 2008, 2009, 2010 and 2011
3. Quarterly and Annual reports
4. Samples of weekly surveillance reports
5. MOU between MOH and WHO on IDSR
6. WHO Consolidated Grant Agreement, Amenment-1, 2009
7. IDSR Technical Guidelines in the African region, 2010.
8. IDSR case definition guidelines.

*These documents are being consolidated in a USAID Health Office folder and will be shared with the evaluation team

5. Evaluation Purpose and Questions

Purpose

The overall purpose of this mid-term evaluation is to determine how effective WHO is in implementing the core aims of the IDSR project and to recommend programmatic shifts, if necessary, to more effectively achieve the project's aims. Specifically, the evaluation team will:

- Assess whether a facility-based integrated disease surveillance and response (IDSR) system at the state and county levels has been established and is working;
- Assess the effectiveness of the IDSR system in relation to regular and timely reporting of outbreaks and epidemic alerts and prompt responses at State and County levels;
- Assess the extent and effectiveness of integration of vertical disease surveillance activities (such as for guinea worm, polio, onchocerciasis, leishmaniasis etc.) at State and County levels;
- Assess to what extent capacity is being built among MoH staff at the various levels of the system, such that the program will continue once the project ends.
- Assess the usefulness of the transport and communication equipments provided to the state and county surveillance offices

The evaluation should provide recommendations for improving impact during the life of the project and any key issues USAID should consider in looking beyond the life of the project.

Evaluation Questions

Effectiveness of Overall Project

1. Are the project's core activities being implemented as planned?
 - o Have State and County Surveillance Officers been recruited and deployed as planned?
 - o Have IDSR materials (guidelines, data collection tools, case definitions etc.) been developed and disseminated to health centres and units effectively?
 - o Has training of primary health care workers on epidemic preparedness and response been effective? Are trainees using the IDSR materials?
2. What, if any, are major overall shortcomings that should be addressed for effective project implementation?
3. What are MoH, other donor, and stakeholder impressions of the program?

Timely Reporting and Response

4. Are IDSR data accurately recorded and reported on a timely basis to higher levels within the system?
 - o Of those whose staff have been trained, which, and how many, health facilities and counties are submitting IDSR reports?
 - o How many submit regularly on a weekly and monthly basis?

- Have the communication and transportation equipment provided at the State and County level improved accurate and timely reporting? Is equipment being used effectively and appropriately?
5. When outbreaks and epidemic alerts are reported, are they responded to promptly and effectively?
- To what extent are States and Counties prepared to respond to outbreaks vis-à-vis prepositioning of drugs, reagents, vaccines, personal protective equipment & materials?
6. Are IDSR data used for decision-making? If so, how?

Integration

7. How have/are other disease surveillance programs being integrated into IDSR?
- Are there regular coordination meetings at different levels of the system?
 - Do IDSR trainings include strategies and approaches (including tools) for integrating various disease surveillance activities?

Capacity Building

8. What key strategies is WHO using to build the necessary institutional capacity within the Ministry of Health to manage and run the disease surveillance and response program once the project ends?
- Is there apparent and effective leadership from the MoH at the National, State and County levels on the IDSR program? What evidence is there that the MoH 'owns' the program?
 - To what extent is WHO investing in recurrent costs (e.g. salaries/stipends) that will be difficult for the Ministry of Health to assume once the project ends?

Future Directions

9. What are critical lessons learned from the program experience to date?
10. Is the current approach a sound approach to continue with?
- If not, what adjustments to the current program may be necessary?
 - What key issues should USAID consider for the final year of the project?
 - What key issues should USAID consider looking beyond the life of the project?

6. Evaluation Methods and Procedures

The External Evaluators will be provided the information provided in Section 3, above, before arriving in Sudan. They will be expected to be familiar with this information prior to arriving in Juba.

A Team Planning Meeting (TPM) will be held upon arrival in Juba to agree on how team members will work together, how they will interact with the client (USAID) and other stakeholders, and to develop a work plan and finalize a Travel Schedule. The team will conduct meetings in Juba with USAID/Sudan, key GOSS institutions and implementing agencies. The team will need to visit project site(s) so some travel arrangements will be arranged prior to the team's arrival. During the TPM the team will finalize the methodology to be used and produce the evaluative instruments to be employed. The team will use the Answering Questions with Secondary Data approach detailed in the MSI Evaluation and Special Study Guide to develop detailed qualitative and quantitative methodological approaches to meeting the terms of this Scope of Work.

We expect that in addition to basing the evaluation's findings on interviews and review of project documents, the team will also utilize the following simple approaches:

- a) Desk review of key data sources from IDSR implementer, WHO, as well as from vertical programs supported by other agencies (e.g. Carter Center) and the Ministry of Health (National and State levels).
- b) Semi-structured interviews using vetted tools to collect qualitative and quantitative (e.g. # of counties covered, # of counties with equipment etc.) at national, state and county levels; piloting of questionnaires is highly encouraged; USAID to review questionnaires prior to finalization.
- c) Field trips to IDSR implementation sites.
 - a. Field trips to include two counties in each of the following regions (specific states/counties can be determined at the TPM): Upper Nile, Bahar el Ghazal, Equatoria. One county will be rural and one will be urban. Three to four health facilities should be visited in each county and activities should include meeting with the State Ministry of Health and County Health Departments. A suggested plan is: Wau/Twic, Malakal/Bor, Yei/Kapoeta⁹⁵

It is expected that the evaluation team will have a clear analytical framework

Once the methodology has been finalized at the TPM it will be shared with USAID as part of the work plan approval process.

7. Team Composition and Participation

Team Composition

USAID/Sudan is conducting the Mid-Term Review in a collaborative manner to maximize USAID, GOSS and Implementing Partners' learning opportunities. Accordingly, the team will consist of the following individuals:

⁹⁵ Accessibility to rural counties is a major problem due to rain and insecurity

- Two External Evaluators contracted by MSI
- One representative from GOSS (Juba-based)
- One representative from USAID Washington
- One non-Sudan-based representatives from WHO, possibly from the Eastern Mediterranean Regional Office

All team members are expected to participate on a full-time basis throughout the evaluation period. Additional inputs may come from other staff from these agencies when and where possible.

MSI will facilitate the participation of any GOSS and State Officials. The Implementing Partner will make recommendations and preliminary contact with these team members.

Team Member Roles and Responsibilities

USAID, GOSS and WHO will provide historical, contextual and programmatic background information that will inform the assessment. MTE Team members are expected to participate in the Team Planning Meeting (TPM), field visits, interviews, the Findings, Conclusions, and Recommendations Workshop and frequent reflection sessions on evaluation learning (that often occur at the end of a day in the field). USAID, GOSS and WHO team members participate as representatives of their respective organizations and are expected to share their learning with their home organizations so that all three key organizations are kept abreast of progress.

The Team Leader will be the formal representative of the team and will arrange for updates regarding progress against the evaluation work plan to the USAID Sudan Activity Manager (or his/her delegate) and MSI's Chief of Party (COP) or Assessment, Monitoring and Evaluation Specialist (AME), as determined at the TPM. The Evaluation Team Leader will take full responsibility for managing the team, organizing its work, and ensuring quality control and delivery of a final report acceptable to USAID.

The Evaluators will take the lead in conducting the evaluation, leading interviews, framing the analysis, facilitating group discussion and consensus, preparing for the debriefing, and producing a draft and a final evaluation report. Precise division of labor between the Evaluators will be determined at the TPM. The Evaluators may ask USAID, GOSS or WHO representatives to be absent from some interviews in order to ensure candid responses from those individuals being interviewed and to avoid any conflicts of interest.

The following capacities must be present among the Evaluators:

1. Strong skills in evaluation, assessment, and analysis of USAID health projects (preferably 7 years or more)
2. Experience in the design, management, or implementation of surveillance or health information system projects in conflict-affected contexts (preferably 3 years or more)

3. Strong research and writing skills
4. Extensive experience working in East Africa and in Sudan and/or similar post conflict environments
5. Facilitation experience, experience leading participatory evaluations, or at least evaluations where evaluation teams include critical stakeholders as active participants
6. Experience arranging meetings, setting up travel schedules for field visits, reporting on meeting outcomes, and generally managing the logistics of the evaluation (although significant logistical assistance will be provided by the SUPPORT team in Juba)
7. Experience in implementing or evaluating the following:
 - a. Local or national disease surveillance programs
 - b. Systems to enable effective and prompt recording, reporting and analysis of health information
 - c. Programs aimed at preventing outbreaks of epidemic prone diseases

8. Activities, Logistics and Timing

Prior to arriving in Juba, the External Evaluators will have familiarized themselves with the background material provided to them, as referenced above.

All team members should be present for the TPM and for initial briefings and discussions with USAID's Health Office and other Mission officers (as determined during initial planning discussion), as well as WHO and GOSS officials. A Work Plan and travel program for the in-country visit as well as the subsequent report writing period will be submitted to USAID for approval during the first few days of work in Juba. The Work Plan will also include a schedule for periodic MSI and USAID progress reports and possible submissions of specific work products, as determined by the parties.

Approximately four days prior to departure the Evaluation Team will present to USAID, Implementing Partners, other development partners and the GoSS an out-briefing, with succinct supporting documents. The Draft Evaluation Report will be submitted prior to the External Evaluators' departure from Juba. There may be more than one exit briefing. The implementing partner will provide a list of GoSS and development partner representatives with whom they have been working to be invited. In addition members of the capacity enhancement working group should be issued an invitation.

The Mission and the WHO will each submit its comments on the draft report within ten work days of receipt of the draft report. The Draft Final Report will be submitted to USAID ten work days after the Team Leader's receipt of USAID's and the WHO's final written comments on the draft.

It is envisioned that all External Evaluators will be in Sudan the entire duration of the evaluation's in-country component (six-day work weeks are authorized), including the TPM, a debriefing, and submission of a draft report to MSI's COP or AME prior to departure from Sudan. In addition to travel days, additional days are

provided for the External Evaluators to complete reading and processing all background information prior to departure for Sudan. Additional days are provided to finalize the report. (See graphic presentation in Section 9, below.)

MSI's field office in Juba will be responsible for travel arrangements (travel, housing in the field, etc.) for the USAID and GOSS team members. MSI will fund travel-related costs for GOSS team member(s), but not for IP or USAID team member(s).⁹⁶ MSI and the Implementing Partners will jointly arrange all meetings for the team, in coordination with GOSS. The team will be provided office and meeting space, as needed, at SUPPORT's Juba Office Compound.

9. Projected Level of Effort (LOE)

Total Duration: Six—eight weeks, including submission of final report

Tasks (Each External Evaluator, unless otherwise noted)	Work Days (6-day weeks in Sudan; 5 outside Sudan)
Initial Preparation Review documents, complete desk review, draft interview guide and proposed methodology, finalize travel schedule and travel days to Juba	5 days prep + 2 days travel
Team Planning Meeting Methodology, work plan development/finalization	2 days
In-Country Evaluation Initial briefings, meetings, field visits	5 days prep (Juba) 18 days in field
Draft Report and Debriefings	8 days
Return Travel	2 days
Final Report Preparation in home country Incorporate collective Sudan feedback, complete final report, and submit to MSI.	3 days (2 days for Team member)
Total for Evaluation Team Leader ⁹⁷	45 days

⁹⁶ If the USAID representative is an Institutionally-Contracted Staff member provided by MSI, his/her travel costs will be provided by MSI separately.

⁹⁷ The Team leader will have an additional 1 day of LOE for final editing of the report.

10. Report Production and Format

The team will present for approval by USAID a draft outline of the report during its first week in country. The report must:

- Distinguish clearly between findings, conclusions (based strictly on findings) and recommendations (based clearly on the report's findings and conclusions);
- Comply with all instructions of the SUPPORT Project's "Evaluation/Special Study Quality Management Guide" and meet the specific requirements of the "Evaluation Report Review—Score Sheet," contained therein;
- Include a Table of Contents; a list of acronyms, an Executive Summary of no more than three to five pages; a section describing the project to be evaluated and purpose of the evaluation; a section on the methodology employed, including relevant skill sets of the evaluators;
- Include any annexes the team considers useful to the reader; and
- A copy of this SOW as an Annex.

A formal debriefing will be provided to USAID, WHO, the GOSS, and other key stakeholders, as scheduled during the TPM and recorded in the evaluation work plan. The team will present key Findings, Conclusions and Recommendations for comment from the stakeholders. The team will record all relevant feedback from the meeting and will respond to all comments in completing its draft reports. The External Evaluators need not include all suggestions in the report, but must consider such suggestions in finalizing the Draft Report.

An electronic (in MS Word) version of the Draft Report will be presented to MSI in Juba prior to the departure of the Team Leader. The document will not exceed 40 pages, excluding annexes and Executive Summary. MSI will review draft and finding no significant quality issues will pass the draft to USAID. USAID has the option to share the draft with WHO for their comments as this stage as well.

The Mission and WHO will each submit its respective comments on the draft report electronically to MSI's AME—using the "track changes" and "comments" functions in MS WORD as much as possible—within ten work days. Each organization will combine internal comments, resulting in a unified set of comments from USAID and WHO (ideally comments from WHO would come in the form of a separate word document). USAID will need to review comments from WHO before submitting to MSI. The external evaluators will then incorporate the final feedback into a final report, which will be branded.

10. Deliverables

- A draft work plan, ensuring that all aspects Answering Questions with Secondary Data (from the TPM) are addressed
- A schedule of travel and key activities

- Initial and interim progress briefings to MSI and the Mission, as determined during the TPM
- Preliminary report outline
- Detailed report outline, annotated with specific findings, conclusion and recommendations submitted to MSI prior to completion of the draft report
- Out-briefing with Mission, WHO, the GoSS and other key stakeholders, with supporting documents
- Draft report prior to departing from Sudan
- Final report within 3 weeks following receipt of comments from USAID on initial draft (including editing and branding in accordance with USAID policies).

Annex 2: Funding for IDSR

Summary of funding for surveillance activities from various donors				
Donors	2008–2009	2009–2010	2010–2011	Description
USAID	\$ 800,000	\$ 1,100,000	\$ 1,356,000	<p>IDSR activities including</p> <ul style="list-style-type: none"> • Training of health personnel on IDSR • Procurement and distribution of transport and communications equipment • HMIS (printing and distribution of reporting tools) • Laboratory reagents
ECHO	\$ 845,000	\$ 1,230,000	\$ 1,430,000	<p>Epidemic preparedness and response in general including:</p> <ul style="list-style-type: none"> • Surveillance (refresher trainings, supervision visits, etc.) • Case management of common epidemic-prone diseases (refresher trainings) • Strengthening coordination on emergency preparedness and response • Supporting outbreak investigation and response (measles, kala azar, malaria, meningitis, anthrax, cholera, etc.) • Prepositioning emergency supplies (diarrhea kits, emergency kits, trauma kits, vaccines, etc.) • Logistics support (warehousing and transportation of supplies) • Human resources (65 percent of ECHO funds is used to recruit field epidemiologists, logistics officers, national public health officers, and support staff) • HMIS (printing and distribution of reporting tools) • Laboratory supplies (equipment, testing kits, and reagents)

Summary of funding for surveillance activities from various donors				
Donors	2008–2009	2009–2010	2010–2011	Description
Common Humanitarian Fund (CHF)	\$ 760,000	\$ 500,000	\$ 560,000	Emergency preparedness and response including: <ul style="list-style-type: none"> • Limited support to surveillance activities • Outbreak responses (measles, kala azar, malaria, meningitis, anthrax, cholera, etc.) • Prepositioning emergency medical supplies • Human resources • HMIS (printing and distribution of reporting tools)

Annex 3: Assessment Tools⁹⁸

Questionnaire for Health Facilities

Interviewer: _____ Date: _____

State: _____ County: _____

Facility: _____ **PHCU** **PHCC** **Hospital**

Note: Ask these questions of someone who works in the health facility, treats patients with communicable diseases, and has been trained in IDSR.

Name of informant: _____

Before we start, can you please show us any IDSR wall chart.

Can you please bring the following documents for us to review (**circle the ones that you observed**)

- a. IDSR case definition booklet
- b. IDSR training materials
- c. Standard treatment guidelines
- d. The form that you use for weekly reporting of diseases
- e. The file that contains all of the weekly reports that you have submitted
- f. The form that you use for monthly reporting of diseases
- g. The monthly tally sheet
- h. The file that contains all of the monthly reports of diseases that you have submitted.
- i. The forms that you use for case investigation (case-based reporting)
- j. The forms that you use for line listing of cases
- k. ALL of the copies of completed case investigation forms and completed line listing forms that you now have at the health facility
- l. Any written record of rumors that have been reported
- m. Guidelines for specimen collection and transportation

⁹⁸ This tool is a sample of the questionnaires developed for this evaluation; similar questionnaires were developed for each level (central, state, county, facility).

n. Supervision checklists that have been filled (at least one of each type)

400. Do you treat patients with communicable diseases? **YES** **NO**
401. Have you been trained in IDSR? **YES** **NO**
402. How many days of training in IDSR have you had? _____
403. When were you trained in IDSR? **2009** **2010** **2011**
404. What is your highest qualification?
- CHW** **Nurse/Midwife** **CO/MA** **Doctor** **Other (specify): _____**
405. What is your title at this health facility? _____

Introduction and Background

406. What is the total number of outpatients treated at this facility each month? ____

407. What is the case definition of malaria?:

Correct **Mostly correct** **Not correct** **Does not know**

408. If you saw a case of malaria, when would you report the case to the county or a higher level? **[Do not prompt]**

Immediately **Not immediately**

409. What is the case definition of measles?:

Correct **Mostly correct** **Not correct** **Does not know**

410. If you saw a case of measles, when would you report the case to the county or a higher level? **[Do not prompt]**

Immediately **Not immediately**

411. What is the case definition of meningitis?:

Correct **Mostly correct** **Not correct** **Does not know**

412. If you saw a case of meningitis, when would you report the case to the county or a higher level? **[Do not prompt]**

Immediately **Not immediately**

413. What is the case definition of cholera?:

Correct **Mostly correct** **Not correct** **Does not know**

414. If you saw a case of cholera, when would you report the case to the county or a higher level? **[Do not prompt]**

Immediately Not immediately

415. What is the case definition of yellow fever?:

Correct Mostly correct Not correct Does not know

416. If you saw a case of yellow fever, when would you report the case to the county or a higher level? **[Do not prompt]**

Immediately Not immediately

417. What is the case definition of viral hemorrhagic fever?:

Correct Mostly correct Not correct Does not know

418. If you saw a case of viral hemorrhagic fever, when would you report the case to the county or a higher level? **[Do not prompt]**

Immediately Not immediately

Human resources at this health facility

419. What is the total number of staff at this facility? _____

420. How many of these staff diagnose and treat communicable diseases? _____

421. How many of these staff have been trained in IDSR? _____

422. Is there laboratory staff at this health facility? **YES NO**

Basic documentation

423. At this health facility, is there a copy of the following documents?

a. IDSR training materials **YES NO**

b. Case definition wall chart **YES NO**

- | | | |
|--|------------|-----------|
| c. Case definition booklet | YES | NO |
| d. Standard treatment guidelines | YES | NO |
| e. Guidelines for specimen collection and transportation | YES | NO |

Reporting forms

424. Do you have copies of the following forms?

a. Form for **case investigation** **Yes, standard** **Yes, non-standard** **No**

b. Forms for **line listing** **Yes, standard** **Yes, non-standard** **No**

 If yes, for how many different diseases are there line listing forms? **(up to 8)** _____

c. Form for **weekly reporting** **Yes, standard** **Yes, non-standard** **No**

d. Monthly tally sheet **Yes, standard** **Yes, non-standard** **No**

e. Form for **monthly reporting** **Yes, standard** **Yes, non-standard** **No**

425. In the last year, which forms have been out of stock or in short supply?

Weekly **Weekly tally** **Monthly** **Monthly tally** **Case** **Line listing**

Supervision and feedback related to surveillance

During the last six months, has anyone visited from the CHD or the SMoH to supervise disease surveillance work at this health facility? **YES** **NO**

[If no, skip the following 2 questions]

426. Is there any written documentation of this supervision of surveillance work? **YES** **NO**

427. What transport did the supervisor use?

Bicycle **Motorcycle** **Motor vehicle**

Community-based surveillance

428. What have staff of this health facility done to mobilize the community to report diseases and to respond to disease outbreaks? **[Do not prompt. Circle any responses given.]**

- a. Trained volunteers
- b. Talked with community leaders
- c. Health education
- d. Other (specify)

429. In the area of this health facility, have any of the following types of community-based volunteers been trained to report disease outbreaks?:

- a. AFP volunteers **Yes** **No**
- b. Guinea worm volunteers **Yes** **No**
- c. Other (describe):

430. Do members of the community sometimes report rumors of disease outbreaks to this health facility?

Yes **No**

431. If yes, are rumors sometimes reported by the following types of volunteers?

- a. AFP volunteers **Yes** **No**
- b. Guinea worm volunteers **Yes** **No**
- c. Village health committees **Yes** **No**
- d. Other (specify)

432. What do you do when you receive such a rumor?

Please show us any written record you have of rumors of outbreaks that were reported to this health facility in the last 12 months. **Observed [photograph]** **Not observed**

Strengthening laboratory capacity

433. Does this health facility have transport media to transport specimens to a higher-level lab?

YES **NO**

434. Does this health facility have a laboratory?

YES **NO**

435. If no, skip the following questions.

436. Can your laboratory do the following tests?: **[prompt]**

- | | | | |
|----|--------------------------|------------|-----------|
| a. | Microscopic exam for MPs | YES | NO |
| b. | Widal | YES | NO |
| c. | Other (specify) | | |

437. In the last two years, what support has your lab received? **[prompt]**

- | | | | |
|----|--------------------------|------------|-----------|
| a. | Training | YES | NO |
| b. | New equipment | YES | NO |
| c. | Provision of supplies | YES | NO |
| d. | Anything else? (specify) | | |

Data management and transmission

438. At this facility, how many people have been trained to complete the weekly surveillance report?
439. How are surveillance reports sent to the CHD? **[Do not prompt. Circle any responses given.]**
- a. Codan radio
 - b. Mobile telephone
 - c. Someone comes to the health facility to collect the paper form
 - d. The health facility delivers the paper form to payam or CHD
 - e. Other (specify) _____
440. Why does the health facility sometimes find it difficult to report on time each week? **[Do not prompt. Circle any responses given.]**
- a. Some weeks, no one trained in IDSR reporting is on duty
 - b. Inadequate transportation
 - c. Impassable roads
 - d. Inadequate communication equipment
 - e. Other (specify) _____
441. Can you show me any example of a graph you have produced showing a trend in disease incidence?
Observed [photograph] Not observed
442. Can you show me any example of an analysis you have performed of surveillance data by age or sex?
Observed [photograph] Not observed
443. Can you show me any map or any analysis showing how disease incidence varied by location in this county?
Observed [photograph] Not observed
444. What is the population of the catchment area of this health facility?
Known Not known

Communication and transportation equipment distributed to the health facility

445. During the last three years, has this health facility received any communication equipment (Codan HF radios, Thuraya satellite phones, VSat, solar panels, computers) or transportation equipment (motorcycles, bicycles) to

support disease surveillance activities?
following questions.]

Yes

No

[If no, skip the

446. What equipment have you received, and when did you receive it? **[Record]**

_____	_____	_____
_____	_____	_____
_____	_____	_____

447. How do you use each of the following types of equipment? [Ask about each type of equipment and skip equipment that is not available at this facility. Do NOT prompt for uses.]

Equipment	Weekly or monthly reporting	Communicate rumors or alerts	Support outbreak investigations	Support outbreak response
Codan HF radio				
Thuraya phone				
Motorcycle				
Bicycle				
Mobile phone				

Other uses of the equipment: _____

Funding of surveillance activities

448. Who pays your salary?

Government **WHO** **NGO** **Other (specify)** _____

449. In the last six months, how many times has the government paid you your monthly salary? _____

450. This year, has the government paid you your salary more regularly than last year?

Yes **No**

Completeness and timeliness of weekly reports from health facilities

451. Is there a file (or book) to store copies of weekly surveillance reports from your health facility?
Yes **No**

452. How many weekly reports did this health facility submit for the four-week period of August 1–28?
 [according to the informant] _____ **Unknown**

453. How many weekly reports are in the file for August 1–28? _____]

454. What is the deadline for weekly reports to be sent to the CHD?

Monday Tuesday Wednesday Thursday Friday Saturday Sunday Unknown

455. Is there any written documentation of the date that weekly reports were submitted? If yes, please show us.

Observed Not observed

456. How many weekly reports for the four weeks of August 1–28 were submitted on time?

[according to the informant] _____ Unknown

457. **[Is there any written documentation to verify this answer?]**

Yes, fully verified Yes, but not fully verified No documentation exists

Completeness and timeliness of monthly reports from health facilities

458. Is there a file to store monthly reports? **Yes [photograph]** **No**
459. How many monthly reports did this health facility submit for June, July, or August?
 [according to the informant] _____ **Unknown**
460. **[How many monthly reports are in the file for June, July, or August? _____]**
461. What is the deadline for monthly reports to be sent to the CHD?
 Unknown **____ the day of the following month**
462. Is there any written documentation of the date that monthly reports were submitted?
 Yes **No**
463. How many monthly reports were submitted on time for June, July, and August?
 [according to the informant] _____ **Unknown**
464. **[Is there any written documentation to verify this answer?]**
 Yes, fully verified **Yes, but not fully verified** **No documentation exists**

Completeness of case investigation reports and line listings

465. For which diseases do you fill a case investigation form? **[Do not prompt. Circle all mentioned]**
 Dracunculiasis Bloody diarrhea AFP Cholera
 Neonatal tetanus Meningitis Plague Measles
 Viral hemorrhagic fever Yellow fever
 Other (specify) _____
466. Has this health facility ever reported any cases of measles, AFP, or AJS? **Yes** **No**

Has this health facility ever completed a case investigation form or a line listing? **[If no, skip the following questions]** **Yes** **No**

467. Is there a file where you store copies of case investigation forms that you have completed?
Yes No

468. If yes, is this ALL of the completed case investigation forms now at the health facility?
Yes No

[Photograph a completed report. Count and record the number of forms ____]

469. Is there a file where you store copies of line listings that you have completed?
Yes No

If yes, is this ALL of the line listings now at the health facility? [If yes, photograph a line listing. Count and record the number of line listings ____] Yes No

470. In the last four months, has this health facility reported any case of measles, AFP, or acute jaundice syndrome (AJS)? Yes No

[To confirm the response, review all weekly reports since June 1, 2011. If no cases of measles, AFP, or AJS were reported, skip the following questions.]

471. What is the total number of cases of measles, AFP, and AJS reported since June 1, 2011? [Indicate whether the evaluator was able to confirm this by reviewing the weekly records.]

a. Measles	___	Confirmed
b. AFP	___	Confirmed
c. Acute jaundice syndrome	___	Confirmed

472. For how many of these cases was a case investigation form or a line listing completed? [according to the informant]

a. Measles	___
b. AFP	___
c. Acute jaundice syndrome	___

473. [Review the files. For how many of these reported cases is a copy of a case investigation form or a line listing available at the health facility?]

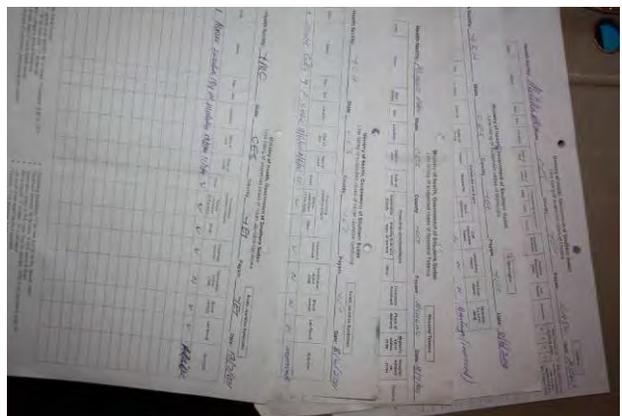
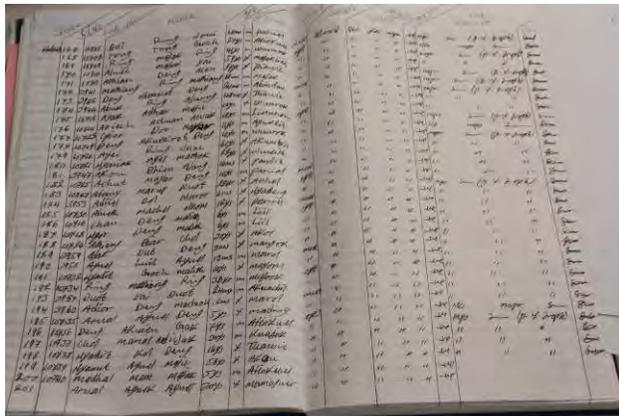
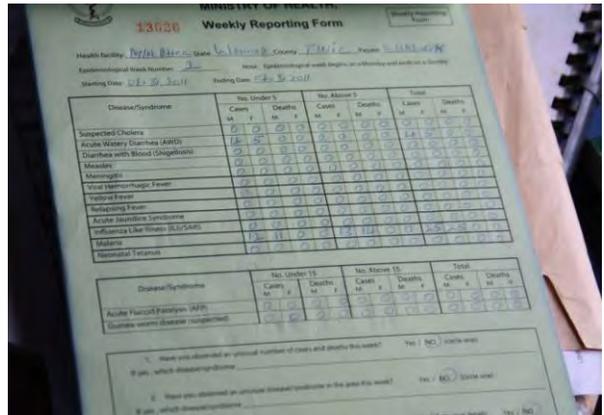
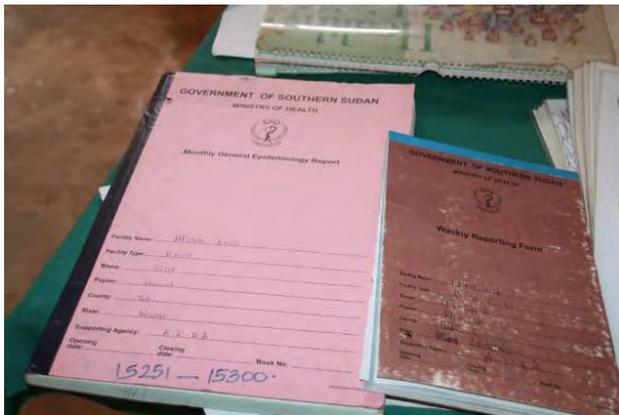
a. Measles	___
b. AFP	___

c. Acute jaundice syndrome _____

Any additional comments

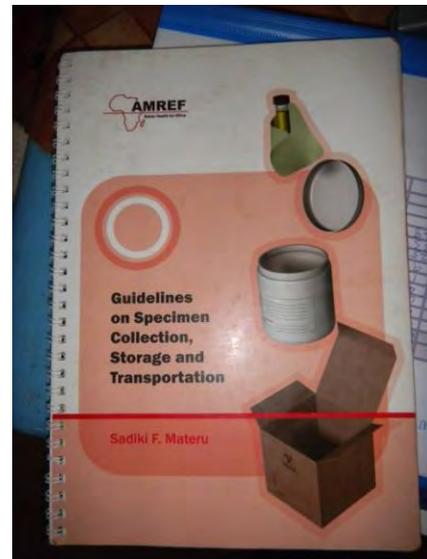
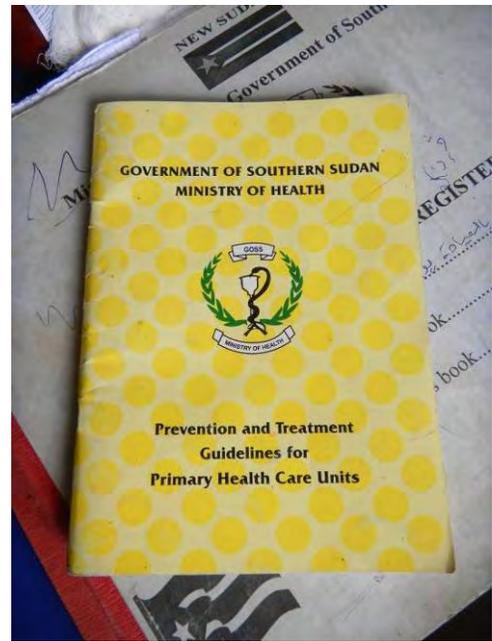
Annex 4: Photos

1. IDSR Tools



2001 **MINISTRY OF HEALTH**
Monthly Epidemiological Report

Diseases/ Condition	Morbidity								Total	Mortality
	< 1yr		1 to 4		5 to 14		>15 (adult)			
	Male	Female	Male	Female	Male	Female	Male	Female		
Uncomplicated Malaria-probable-unconfirmed										
Uncomplicated Malaria-confirmed										
Complicated malaria - referred	0	0	0	0	0	0	0	0	0	
Complicated Malaria-probable	0	0	0	0	0	0	0	0	0	
Complicated Malaria-confirmed	0	0	0	0	0	0	0	0	0	
Acute Watery Diarrhoea/Cholera	0	0	0	0	0	0	0	0	0	
Diarrhoea with Blood	0	0	0	0	0	0	0	0	0	
Neumonia	0	0	0	0	0	0	0	0	0	
Other Respiratory Infection	0	0	0	0	0	0	0	0	0	
Other Diseases	0	0	0	0	0	0	0	0	0	
In Diseases	0	0	0	0	0	0	0	0	0	
Urinary Infections	0	0	0	0	0	0	0	0	0	
Malnutrition	0	0	0	0	0	0	0	0	0	
Anaemia	0	0	0	0	0	0	0	0	0	
Intestinal Parasites	0	0	0	0	0	0	0	0	0	



Weekly Report
 Week No 30
 ALEK PHCC

Acute watery diarrhoea < 7 > 4
 Bloody diarrhoea < 0 > 4
 Malaria < 25 > 47

Maliq Bjak PHCC

Malaria < 18 > 25
 Acute watery diarrhoea < 6 > 1
 Bloody diarrhoea < 0 > 0

AKON PHCC

Malaria < 29 > 39
 Acute watery diarrhoea < 5 > 4
 Bloody diarrhoea < 0 > 2

Atintak PHCC

Malaria < 30 > 19

MINISTRY OF HEALTH GOVERNMENT OF RS
 REPUBLIC OF SOUTH SUDAN
 Juba Capital City
 MURIE Family Health Unit, Murie Town
 Juba State
 Weekly Report Form NHC 82
 Starting Date 1/1/2010 Ending Date 31/1/2010

Disease/Condition	No. of Cases		No. Deaths		Total
	Male	Female	Male	Female	
Acute watery diarrhoea	0	0	0	0	0
Bloody diarrhoea	0	0	0	0	0
Acute watery diarrhoea	0	0	0	0	0
Bloody diarrhoea	0	0	0	0	0
Malaria	0	0	0	0	0
Other	0	0	0	0	0
Total	0	0	0	0	0

TOTAL ATTENDANCE

Disease/Condition	No. of Cases		No. Deaths		Total
	Male	Female	Male	Female	
Acute watery diarrhoea	0	0	0	0	0
Bloody diarrhoea	0	0	0	0	0
Malaria	0	0	0	0	0
Other	0	0	0	0	0
Total	0	0	0	0	0

1. no. individuals displaying symptoms present in the community this week
 2. no. cases of other disease in area this week
 3. hospital visits, cov. time, I. Examinations
 Sign: [Signature] Date: 1/2/2011
 Total = 22

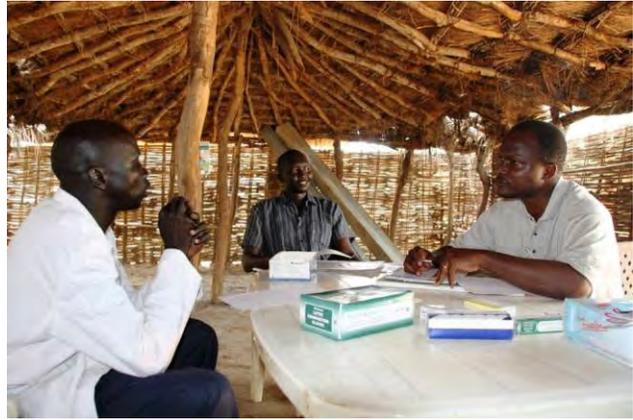
2. Data Analysis



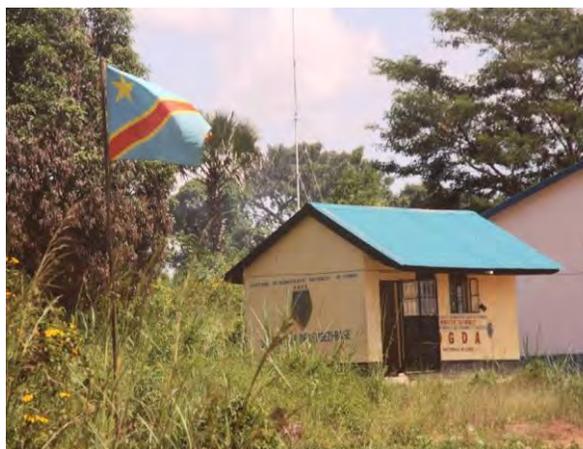
LINE LISTING OF A-F-P CASE 2010 GREATER YEI

EPID #	Name	Age	Sex	Location	County	PHC	Date of onset	PHC visited	PHC advised	PHC referred	PHC followed up	60 Days Follow up?
SUB-EPID 1001	MURIE	18 M	M	KORRA	MURIE	PHC	1/1/2010	Y	Y	Y	Y	NO 22/7/2010
SUB-EPID 1002	MURIE	29 M	M	GUWA	YEI	PHC	4/1/2010	Y	Y	Y	Y	NO 4/11/2010
SUB-EPID 1003	MURIE	90 M	F	YEI	YEI	PHC	3/1/2010	Y	Y	Y	Y	NO 3/11/2010
SUB-EPID 1004	MURIE	36 M	M	YEI	YEI	PHC	1/1/2010	Y	Y	Y	Y	NO DIED
SUB-EPID 1005	MURIE	72 M	F	YEI	YEI	PHC	1/1/2010	Y	Y	Y	Y	NO 5/5-2011
SUB-EPID 1006	MURIE	60 M	M	YEI	YEI	PHC	1/1/2010	Y	Y	Y	Y	NO 6-3-2011

3. Interviews



4. Challenges



Annex 5: The IDSR M&E Plan from the proposed five-year Plan of Action

a. The IDSR Monitoring and Evaluation Plan

The Integrated Disease Surveillance and Response seeks to ensure that coordinated effective and functional systems are available at each level of the health system. This system will generate information for timely action thereby contributing to the reduction of morbidity, disability, morbidity, and determinants of disease. In order to measure progress toward achieving these objectives, appropriate indicators for monitoring progress with implementation of IDSR in the country are needed.

b. Objectives of the IDSR Monitoring & Evaluation Plan

1. To collect, process, analyse, and manage data on IDSR indicators
2. To assess status of implementation of planned activities to ensure accountability and address problems that have emerged in a timely manner
3. To provide feedback to data providers and relevant authorities to inform future planning
4. To document periodically whether planned strategies have achieved expected outcomes and impact

c. Monitoring and Evaluation Framework

The IDSR indicators will be derived from the inputs, processes, outputs, outcome and impact of the IDSR interventions. The IDSR committee will periodically monitor and evaluate the performance of the strategy. External organisations will be involved in the final evaluation just before the end of the plan.

d. IDSR Indicators

In order to monitor IDSR performance in the country, the IDSR core indicators adopted by the WHO in 2003 and other selected input and process indicators will be used.

5.3.1 List of core indicators

Indicator Description

Indicator Description

Impact

- 1 Case Fatality Rates (CFR) for outbreaks of priority diseases
 - Cholera
 - Meningococcal meningitis
 - Hepatitis E
- 2 Attack rates for outbreaks of epidemic prone diseases
 - Cholera
 - Meningococcal meningitis
 - Hepatitis E

Outcome

Case Detection Indicators

- 3 The number of epidemics detected at the national/state level and that were missed by the county level

Reporting Indicators

- 4 Proportion of counties submitting weekly or monthly surveillance reports on time to the National level
- 5 Proportion of health facilities submitting weekly or monthly surveillance reports on time to the county
- 6 Proportion of cases of diseases targeted for elimination, eradication and any other diseases selected for case-based surveillance reported with case-based or line-listing forms.
- 7 Proportion of suspected outbreaks of epidemic prone disease notified to the national level within 2 days of surpassing the epidemic threshold

Outbreak Investigation Indicators

- 8 Proportion of reports of investigated outbreaks that includes analyzed case-based data
- 9 Proportion of investigated outbreaks with laboratory results

Epidemic Preparedness & Response Indicators

- 10 Proportion of confirmed outbreaks with a nationally recommended public health response

Data Analysis Indicators

- 11 Proportion of counties in which a current line graph is available for selected priority diseases
-

5.3.2. Other selected IDSR indicators

INDICATOR DESCRIPTION

Impact

- 1 Incidence and magnitude of priority diseases
- 2 Priority diseases Treatment success rate

Outcome

Case Detection Indicators

- 3 Proportion of health facilities with Standard Case Definitions
- 4 Proportion of counties with log of rumours for outbreaks
- 5 Proportion of laboratories with capacity to confirm selected epidemic prone diseases
- 6 Proportion of Laboratories with Standard Operating Procedures

Outbreak Investigation Indicators

- 7 Proportion of States/counties with functional Rapid Response Teams

Epidemic Preparedness & Response Indicators

- 8 Proportion of states/counties with functional EPR committees

Data Analysis Indicators

- 9 Proportion of health facilities with rates derived from demographic data

Feedback Indicators

- 10 Proportion of states/counties with feedback from the national level, (MOH)
- 11 Proportion of health facilities with monthly written feedback from the states/counties

IDSR Support Function Indicators

- 12 Proportion of health facilities with health workers trained using IDSR training materials

Outputs

Case Detection Indicators

- 13 Number of Standard Case Definitions distributed
- 14 Number of copies of the revised IDSR technical guidelines distributed
- 15 Number of copies of log of rumours for outbreaks distributed
- 16 Number of HF that received lab reagents & equipment for confirming selected diseases
- 17 Number of Standard Operating Procedures distributed

Reporting Indicators

- 18 Number of integrated reporting forms distributed to the counties/health facilities

Outbreak Investigation Indicators

- 19 National Rapid Response Team established and trained
- 20 Number of states/counties Rapid Response Teams trained
- 21 Number of Outbreak investigation kits distributed
- 22 Number of Outbreak investigation guidelines distributed

Epidemic Preparedness & Response Indicators

- 23 EPR Plan developed at the National level
- 24 Number of county EPR committees trained
- 25 Security stocks of vaccines & medicines for EPR established at National/state levels

Data Analysis Indicators

- 26 Number of records officers trained in data management
- 27 Number of data analysis guides distributed

Feedback Indicators

- 28 Number of weekly reports sent to lower levels

IDSR Support Function Indicators

- 29 Number of counties trained using the IDSR modular training materials

Inputs

Funds

- 30 Proportion of budgeted funds that were realised for implementation of IDSR activities

Human Resources

- 31 Number of surveillance officers recruited

Transport

- 32 Number of vehicles procured for the national/state/county/health facility levels

Data Management

- 33 Number of computers procured to facilitate data management at the National/state/county levels

e. Data Sources

The health facility, county, state, and national level are mandated to have the relevant tools which include Monitoring charts for tracking IDSR core indicators, Outpatient register, Inpatient register, Weekly reporting forms for health facilities, state/county summary for weekly reports, Case-based and/or line listing report forms, Outbreak investigation reports, Log of suspected outbreaks and rumours, supervisory visit reports from the state/county, and laboratory reports

f. Monitoring performance

In order to monitor the IDSR performance, information from the above sources will be compiled, analyzed and utilized by the health facilities, counties, state and National levels on annual basis. This will be coordinated by the Epidemiology and Surveillance Division and presented to the IDSR committee to recommend appropriate actions.

g. Evaluation of the IDSR Strategic Plan

This will be a joint process involving IDSR stakeholders and external partners and will be undertaken evaluate the IDSR Plan of Action at the end of 2014 and findings will be used to inform the compilation of the new IDSR Plan of Action.

Annex 6: WHO's documentation of IDSR basic training

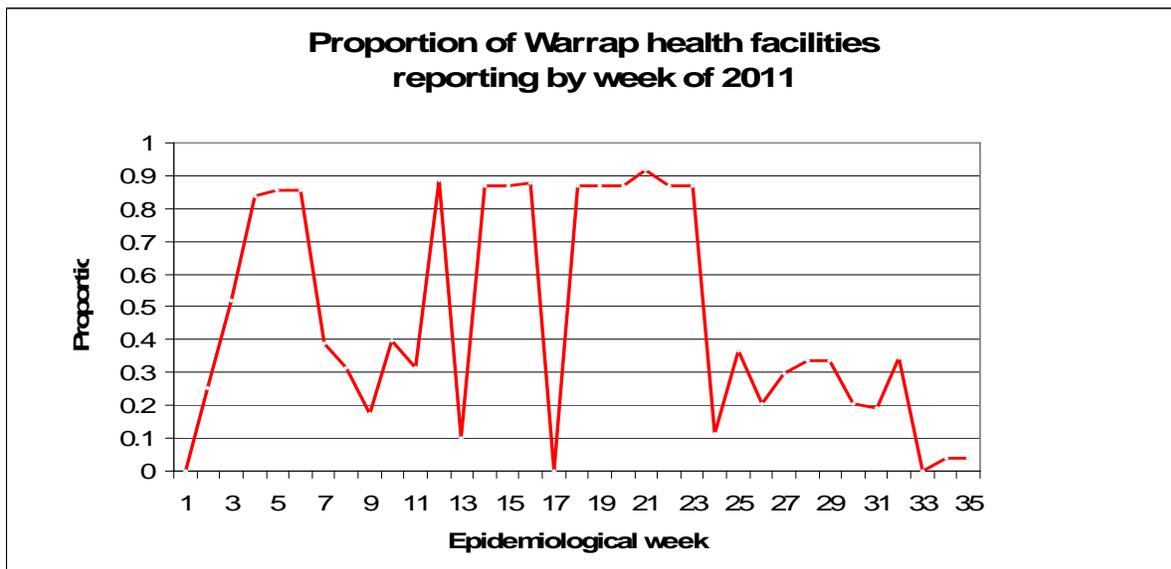
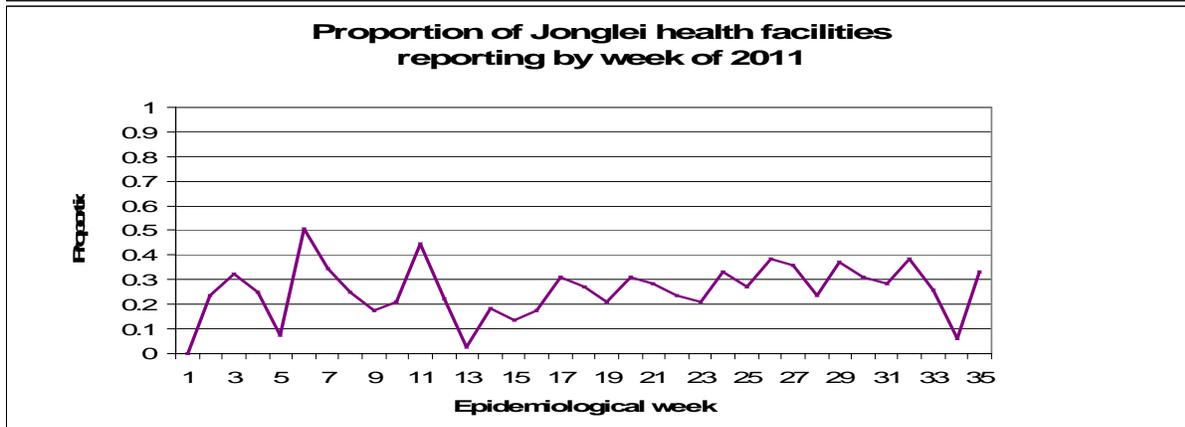
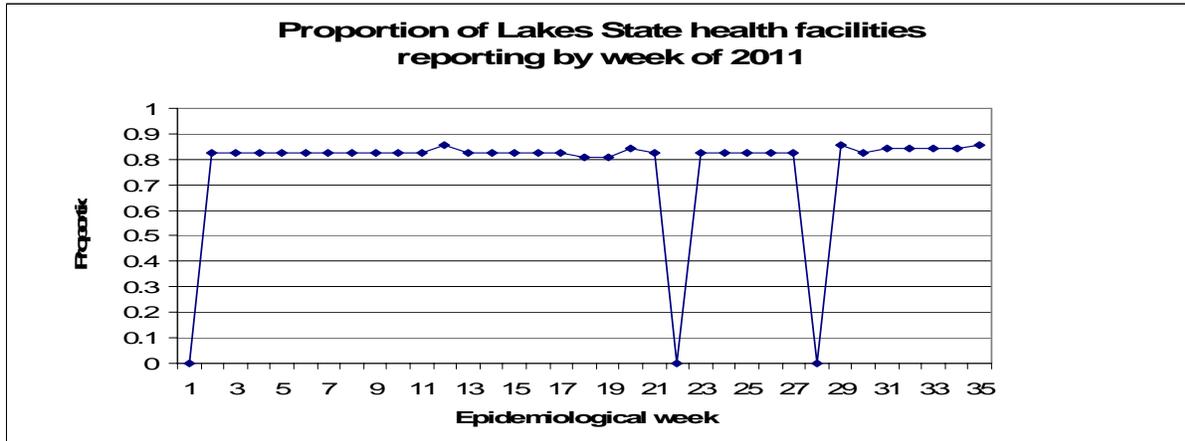
IDSR basic training for staff of health facilities				
County or town	State	Start	Duration (days)	Number of participants
Juba	CES	21/05/2009	3	30
Aweil E & S	NBEG	17/06/2009	3	44
Kuajok	Warrap	16/08/2009	3	30
Lainya	CES	19/08/2009	3	19
Kajo Keji	CES	24/08/2009	3	21
Tonj North	Warrap	28/08/2009	3	40
Tonj	Warrap	1/9/2009	3	32
Twic	Warrap	7/9/2009	3	33
Gogrial East	Warrap	23/09/2009	3	41
Bentiu	Unity	23/09/2009	3	26
Bentiu	Unity	26/09/2009	3	34
Magwi	EES	12/10/2009	3	20
Torit	EES	12/10/2009	3	20
Bor	Jonglei	24/10/2009	3	41
Ibba	WES	9/11/2009	2	19
Ezo	WES	11/11/2009	2	11
?	?	23/11/2009	2?	58
Subtotal 2009				519
	Warrap	21/12/2010	2	45
Raja	WBEG	26/12/2010	3	20
Wau	WBEG	29/12/2010	3	30
Subtotal 2010				95
Malakal	Upper Nile	24/02/2011	3	46
Kwajok	Warrap	3/3/2011	3	40

Fashoda	Upper Nile	3/3/2011	3	33
Aweil	NBEG	8/3/2011	3	41
Renk	Upper Nile	10/3/2011	3	36
Yambio	WES	11/3/2011	3	42
Wau	WBEG	16/3/2011	3	22
Nasir	Upper Nile	17/03/2011	3	25
Juba	CES	22/03/2011	3	28
Longchuok	Upper Nile	24/03/2011	3	34
Tambura	WES	5/4/2011	3	58
Kwajok	Warrap?	8/4/2011	4	35
Torit	EES	12/4/2011	3	42
Aweil	NBEG	31/05/2011	3	25
Pieri	Jonglei	2/6/2011	3	31
Rumbek East	Lakes	23/06/2011	3	30
Yirol West	Lakes	27/6/2011	3	42
Rumbek Centre	Lakes	?	3	25
Kajo Keji	CES	4/7/2011	3	21
Abyei	Warrap	22/07/2011	3	29
Tong East	Warrap	?	3	25
Subtotal 2011				710
Total 2009–2011				1324

IDSR laboratory technician training				
County or town	State	Start	Duration (days)	Number of participants
	Upper Nile	21/02/2011	5	39
	CES	7/3/2011	4	43
	Warrap	21/03/2011	5	22
Juba	CES	27/04/2011	2	27
Total				131

Annex 7: Trends in the completeness of weekly reporting from three states

(based upon data in the national dataset of weekly reports)



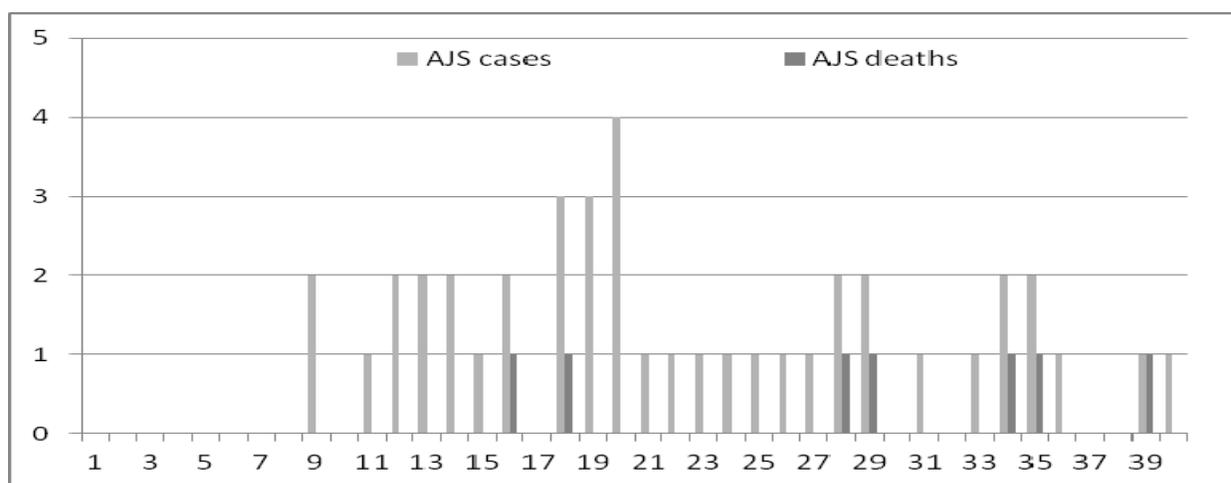
Annex 8: Examples of data demanding action

From a quick review of the dataset of weekly reports submitted for June, July, and August 2011 from the states that it visited, the evaluation team identified four examples of data that should have resulted in an alert or an attempt to verify whether the data were correct. The evaluation team confirmed, however, that the data were merely transmitted to a higher level without any investigation or comment.

1. For week 27 of 2011, the SSO of Jonglei State recorded in the Excel file for the state that Kolnyang PHCC of Bor County (the state capital) had reported 36 cases of viral hemorrhagic fever. This data was passed along to Juba without comment and now appears in the national dataset. When asked about this data, the SSO said that he was not aware of it.

Ministry of Health - Government of Southern Sudan																	
Summary of Epidemiological Weekly Report format by Health Facility																	
No. of Health Facility: 33			State: Jonglei			No. of Counties: 7			No. of Payams: 19								
Epi Week No. 27			Starting Date: 27/7/20			Ending Date: 3/7/2011											
Priority Diseases																	
County	Payam	Health Facility	Supporting Organization	Suspected Cholera				AWD				ABD				VF	
				< 5 yrs		> 5 yrs		< 5 yrs		> 5 yrs		< 5 yrs		> 5 yrs		< 5 yrs	
				C	D	C	D	C	D	C	D	C	D	C	D	C	D
Akobo	Bilkey	Akobo Hospital	IMC	0	0	0	0	27	0	35	0	20	0	31	0	0	0
Twic East	Lith	Khiir PHCU	CARE	0	0	0	0	5	0	3	0	0	0	2	0	0	0
Pibor	Boma	Hospital	Merlin	0	0	0	0	3	0	1	0	0	0	7	0	0	0
Bor	Baidit	Mathiang PHCU	CHD	0	0	0	0	6	0	2	0	0	0	1	0	0	0
	Baidit	Baidit PHCC	CHD	0	0	0	0	4	0	1	0	0	0	3	0	0	0
	Kolnyang	Kolnyang PHCC	SMC	0	0	0	0	13	0	9	0	0	0	0	0	36	0

2. Beginning in week 9 of 2011, Torit hospital began to regularly report cases of acute jaundice syndrome. A total of 44 cases, including eight deaths from AJS, were reported from the hospital over the following 34 weeks. Yet, when the evaluation team visited the hospital, the CHD, and the state surveillance office, they found no case investigation forms completed on any of these cases.



3. During week 23 of 2011, Akop PHCC of Tonj North County of Warrap State reported 12 cases of measles. However, at the state level there were no case forms and no line listings available for any diseases other than AFP.

Ministry of health, Go																					
Summary of Epidemiologic																					
Week EPIDE N0,6				Start 30/5/2011.																	
Key		C= Cases				D=Deaths															
#	County	Payam	Health Facility	Category	Responsible partner	Suspected Cholera				Acute Watery Diarrhoea				Diarrhoea with Blood (Shigellosis)				Measles			
						< 5yrs		> 5Yrs		< 5yrs		> 5Yrs		<5yrs		>5yrs		<5yrs		>5yrs	
						C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Sub total						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Tonj North	Akop	Akop	PHCC	CCM/MO	0	0	0	0	0	0	0	0	1	0	10	0	12	0	0	0
		Alabek	Langkap	PHCU	CCM/MO	0	0	0	0	7	0	6	0	0	0	0	0	0	0	0	0
		Aliek	Aliek	PHCU	MOH	0	0	0	0	11	0	6	0	6	0	4	0	0	0	0	0
		Warrap	Warrap	PHCC	MOH/W	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4. Hai Bafra PHCU of Wau County of WBeG State reported eight cases of measles during week 27 (July 3-9). No case investigation took place at that time. Hai Dinka PHCU of the same county reported four more cases of measles during week 32 (August 5-13). On August 25, the WHO International Focal Point for WBeG completed several case investigation forms, collected blood specimens, and compiled a line listing for these and other linked cases that had a date of onset of August 5-8. These blood samples were sent to Juba on August 31. The samples were sent from Juba to Nairobi on September 9. The lab results were returned to Juba on September 15. As of early October when the evaluation team visited, however, staff in WBeG state were unaware of these lab results.

State	County	Name of Patient	Suspected Disease	Type of Specimen	Date of Collection	delay 2 (days)	Date Sent to Lab	delay 3 (days)	Date Result Received	delay 2 + 3 (days)	Lab Result	Remark		
WBeG	Wau	[Redacted]	Measles	Blood	25-Aug-11	15	9-Sep-11	6	15-Sep-11	21	Positive	Rubella IgM		
			Measles	Blood	25-Aug-11	15	9-Sep-11	6	15-Sep-11	21	Positive	Measles IgM		
			Measles	Blood	25-Aug-11	15	9-Sep-11	6	15-Sep-11	21	Positive	Measles IgM		
			Measles	Blood	25-Aug-11	15	9-Sep-11	6	15-Sep-11	21	Positive	Measles IgM		
			Measles	Blood	25-Aug-11	15	9-Sep-11	6	15-Sep-11	21	Positive	Rubella IgM		
	Jur River		Measles	Blood	26-Aug-11	14	9-Sep-11	6	15-Sep-11	20	15-Sep-11	20	Negative	
			Measles	Blood	26-Aug-11	14	9-Sep-11	6	15-Sep-11	20	15-Sep-11	20	Negative	
			Measles	Blood	26-Aug-11	14	9-Sep-11	6	15-Sep-11	20	15-Sep-11	20	Negative	
			Measles	Blood	26-Aug-11	14	9-Sep-11	6	15-Sep-11	20	15-Sep-11	20	Negative	
			Measles	Blood	26-Aug-11	14	9-Sep-11	6	15-Sep-11	20	15-Sep-11	20	Positive	Measles IgM
			Measles	Blood	26-Aug-11	14	9-Sep-11	6	15-Sep-11	20	15-Sep-11	20	Positive	Measles IgM
			Measles	Blood	26-Aug-11	14	9-Sep-11	6	15-Sep-11	20	15-Sep-11	20	Positive	Measles IgM
					Average = 7		Average = 16		Average = 23					

Annex 9: What must be done before the national public health laboratory will be functional?

The evaluation team met with Mr. Michael Lasuba of the Ministry of Health and Ms. Jane Pita of WHO to better understand the outstanding issues that must be addressed before the national public health laboratory in Juba will be able to confirm the IDSR focus diseases.

Mr. Lasuba explained that the building where the laboratory will be located has been completed. Only a few minor tasks (connecting the building to a water supply and to an electrical supply) must be accomplished before the facilities will be operational. The contractor who constructed the building still has not agreed to the final terms of payment by the RSS. This could possibly delay the opening of the building; however, the Ministry of Health has the keys to it.

The laboratory still lacks some essential equipment (e.g., for microbiological culturing, for ELISA testing for measles, etc.), however, WHO and other donors have agreed to pay for these and, according to Ms. Pita, they have already ordered them.

The Ministry of Labor has allotted to the Ministry of Health the positions required to staff the laboratory. Qualified South Sudanese candidates have applied for these positions. However, RSS rules specify that staff be selected by the Recruitment Board of the Ministry of Labor, and this body has been inactive since 2010. The Ministry of Health has appealed to the Ministry of Labor for an exception to allow the MoH to directly recruit the lab staff themselves. WHO has agreed that once the staff have been recruited, WHO will arrange for any additional training required.

WHO has ordered a supply of reagents to get the laboratory started.

Dr. Baba of the Ministry of Health informed the evaluation team that he expects the public health laboratory to become operational in the next 12 months.

Meanwhile, WHO has been informed by the Kenyan laboratory that has been testing for measles that it will not be able to continue this testing for South Sudan. WHO believes that it will have to reach an agreement with some alternative laboratory in the region.

Annex I0: Use of surveillance data for decision-making

The IDSR program powerfully demonstrates its value any time that a disease outbreak is detected and confirmed through IDSR reporting and investigations and the health system can mount a timely and effective response. Some prominent examples of this include the following:

- The FY 2010 Q2 report notes that “. . . sporadic cases of measles cases among children have been reported in many health facilities, and there is a need to support another catch-up vaccination campaign against measles.” The FY 2010 annual report notes that “based on the reporting mechanism in place, WHO has been supporting the accelerated EPI campaign weeks in Southern Sudan.” The FY 2011 Q1 report notes that “as a result of the measles laboratory confirmation, State Ministry of Health in collaboration with WHO, UNICEF and health partners had taken decision to carryout measles immunization campaign targeting children between 6 months to 15 years of age in Kwajok and Mayom so as to ensure that all returnee children have a second opportunity for measles vaccination.”
- The FY 2010 annual report notes that “[t]he number of reported [kala azar] cases in the last nine months is 20 times higher compared to the same period in 2009. . . . 80 percent of cases were seen at one treatment center. Technical and financial support and supplies (drugs, diagnostic kits) were provided to assist with case management.” The FY 2011 Q1 report notes that “. . . the case fatality rate has come down from 5 percent to 3 percent due to increased availability of treatment centers and improve[d] case management.”
- The FY 2010 Q3 report notes that “. . . eight cases of anthrax were confirmed from WBeG. WHO supported health education campaigns to discourage consumption of animal carcasses.”

IDSR saves resources and avoids distraction and panic when it can confirm that the situation is under control and does not require emergency measures:

- The FY 2010 annual report notes that roughly 100 cases of meningitis were reported and that “[t]he isolated pathogens were sensitive to both chloramphenicol and ceftriaxone. None of the above locations [reporting the cases] crossed [the] alert or epidemic threshold, and all confirmed cases were managed properly at facility level.” Hence, IDSR confirmed that the situation was under control and did NOT warrant an expensive and time-consuming vaccination campaign or the introduction of different drugs.
- The FY 2010 annual report notes that acute watery diarrhea (AWD)/cholera surveillance has documented an increase in AWD cases reported (likely due to improved reporting) but a decrease in case fatality and no confirmed cases of cholera (out of 24 lab tests performed). Conclusion: no cholera outbreak.

- The FY 2011 Q1 report notes that yellow fever was ruled out when hepatitis cases were reported in counties bordering a yellow fever outbreak in northern Uganda. Again, no need (yet) to mount an expensive re-vaccination campaign.

IDSR data can call attention to endemic diseases and to advocate for improved resources to combat them:

- The FY 2010 annual report noted that large numbers of malaria deaths were reported from 11 counties. This prompted health authorities to investigate the adequacy of malaria case management in these counties. It notes that “. . . severe shortage of anti-malarial drugs and health personnel were reported.”

Annex I I: Proposed scope of work for a short-term consultant to strengthen implementation of IDSR in South Sudan

USAID should recruit a short-term consultant with expertise and experience in design and implementation of communicable disease surveillance systems in developing countries to work with the Ministry of Health and WHO staff in South Sudan to strengthen implementation of the country's IDSR program by accomplishing the following:

1. The consultant should be stationed for at least three weeks in at least one state outside of CES to work with the SSO, all accessible CSOs, and WHO staff at the state level (International Focal Point, National Focal Point, AFP staff, EPI staff, etc.) to develop and field-test a replicable approach for WHO staff to build the capacity of the SSO and CSOs to fulfill the following responsibilities:
 - i. Monitoring of the timeliness of weekly reporting by health facilities;
 - ii. Correct completion of case investigation forms, line listings, case investigation reports, and the outbreak log according to national IDSR guidelines;
 - iii. Regular review and analysis of the aggregate and case-based IDSR data to identify and investigate suspected outbreaks and summarize the findings in a regular monthly report from each SSO and CSO;
 - iv. Provision of written feedback to CHDs and health facilities;
 - v. Regular (e.g., biannual) visitation of all CHDs (by SSOs) and the majority of functioning health facilities (by CSOs) to supervise IDSR work and document the supervision by completing an IDSR supervisory checklist.
2. During the consultant's stay at the state level, s/he will work with the SSO and CSOs to field-test the IDSR supervisory checklists and modify them as necessary to assure that they provide for a practical and effective supervisory approach (i.e., one that SSOs and CSOs can and will sustain with a minimum of external support and oversight).
3. During the consultant's stay at the state level, s/he will work with the SSO, accessible CSOs/CHDs, and WHO staff to convene weekly meetings at state and county levels of surveillance staff (including those for AFP surveillance, guinea worm surveillance, etc.) to develop joint work plans and develop joint approaches to supporting surveillance.
4. During the consultant's stay at the state level, s/he will develop, field-test, and document an approach for monitoring these efforts of WHO staff to build IDSR capacity and promote integration of surveillance. The aim is to develop a means whereby these efforts by WHO staff can be regularly monitored (such as through quarterly reports or presentations at the IDSR Annual Review Meeting) and held accountable for achieving progress with capacity building and integration of surveillance.

5. At the national level, the consultant will assist the MoH and WHO to achieve the following:
 - i. Further simplify the case definitions;
 - ii. Assure that Arabic-language versions of the case definitions and other key job aides are printed and widely distributed;
 - iii. Assure that the weekly reporting booklets are printed and distributed in sufficient quantities and kept in stock at all functional health facilities;
 - iv. Design and implement in all states and all focus counties a system for monitoring the completeness and timeliness of weekly IDSR reporting;
 - v. Design and implement a system for assigning a unique identifier to each case investigation form and lab specimen and assuring that this unique identifier is transmitted and preserved whenever information on a case or the lab specimen or a lab result is transmitted;
 - vi. Design and disseminate to all SSOs and CSOs an improved standard outbreak log and written guidance on its use. This should include a system for synchronizing the information contained in the outbreak logs of different sites (i.e., information should be shared between a log at state level and a log at national level based upon the unique identifier assigned to each index case);
 - vii. Devise mechanisms to expedite the return of lab results from Nairobi and the feedback of these results to state and facility levels;
 - viii. Design and implement an IDSR training database and a system for compiling from each IDSR training workshop the names of participants, their qualifications, and the name and location of the health facility at which they work;
 - ix. Take an inventory of the location and disposition (i.e. is the equipment functional and being actively used?) of all IDSR communication equipment that has been distributed;
 - x. Develop detailed plans to redistribute surplus IDSR equipment from sites where it is not being used to sites where it is needed;
 - xi. Strengthen the current Excel-based data management system pending the deployment of DHIS software in all 10 states.

Annex I2: A balanced set of indicators for monitoring and evaluation of IDSR in South Sudan

Indicator	Definition of the indicator	Frequency of measurement and reporting
1. Timeliness of weekly reporting by health facilities	Percentage of functional health facilities submitting weekly surveillance reports by Tuesday of the following week.	This indicator should be measured weekly at county, state, and national levels and summarized in their respective monthly or quarterly reports.
2. Completeness of case-based reporting	Percentage of cases of suspected cholera, meningitis, VHF, guinea worm, measles, neonatal tetanus, rabies, plague, yellow fever, and AJS reported on a weekly form for which a completed copy of a case investigation form is available at the county, state, and national surveillance offices.	This indicator should be reported monthly or quarterly (i.e., each three months) and externally assessed during each supervisory visit.
3. Completeness of outbreak logs	Percentage of suspected outbreaks of cholera, meningitis, VHF, guinea worm, measles, neonatal tetanus, rabies, plague, yellow fever, and AJS reported on a weekly form that are recorded on outbreak logs at county, state, and national surveillance offices.	This indicator should be reported monthly or quarterly and externally assessed during each supervisory visit.
4. Timeliness of investigation	Percentage of suspected outbreaks appearing on an outbreak log for which a laboratory specimen is collected within two days of the date of notification of the suspected outbreak.	This indicator should be reported monthly or quarterly and externally assessed during each supervisory visit.
5. Timeliness of laboratory confirmation	Percentage of suspected outbreaks appearing on an outbreak log for which a laboratory result is returned within seven days of the date that a laboratory specimen was collected.	This indicator should be reported monthly or quarterly and externally assessed during each supervisory visit.

6. Completeness of reporting by counties and states	Percentage of counties and states submitting monthly reports which summarize the reports from health facilities and any suspected outbreaks detected and investigated.	This indicator should be assessed and reported on quarterly from review of the available county and state reports.
7. Completeness of supervision of counties and health facilities	Percentage of counties and health facilities supervised in the last six months and documented with an IDSR supervisory checklist.	This indicator should be assessed quarterly during the supervisory visit from the next higher level.
8. Analysis of surveillance data by state and county surveillance offices	Percentage of state and county surveillance offices displaying graphs and tables they have produced showing disease trends and analysis by location, age, or sex.	This indicator should be assessed quarterly during the supervisory visit from the next higher level.
9. Completeness of reporting by WHO state-level offices	Percentage of WHO's state-level offices submitting a quarterly report summarizing progress with capacity building and integration and summarizing trends in the above indicators.	WHO/South Sudan should report on this quarterly and summarize the key findings from all 10 states.

Annex 13: Persons interviewed and sites visited

1. Juba (national level)
 - a. Ministry of Health
 - i. Dr. Samson Paul Baba—Director General of Planning and Coordination
 - ii. Dr. Margaret Ito—DG for Training and acting DG for Community and Public Health
 - iii. Dr. John Lago—Director of Epidemic Preparedness and Response
 - iv. Dr. Richard Lako—Director of Monitoring and Evaluation
 - v. Mr. Robert Gama Hassan—Inspector for Disease Surveillance
 - vi. Mr. Micahel Lasuba—with the laboratory services unit of the Diagnostic Services Directorate
 - b. WHO/South Sudan
 - i. Dr. Abdi Aden Mohamed—Head of Office, WHO/SS
 - ii. Dr. Abdinasir Abubakar—Medical Officer/Epidemiologist, WHO/SS
 - iii. Dr. Yehia Mostafa, Medical Officer and EPI/PEI Team Leader, WHO/SS
 - iv. Mr. Julu Louis K.J.—National Public Health Officer
 - v. Ms. Jane Pita—with the EWARNS/IDSR unit of WHO/SS
 - vi. Mr. Michael—coordinator for transport of lab specimens
 - c. Other UN and multilateral partners
 - i. Dr. Romanus Mkerenga—Chief of Health and Nutrition, UNICEF/SS
 - ii. Mr. Safari Djumapili—Head of the Emergency Preparedness and Response Unit of the UN Office for the Coordination of Humanitarian Affairs (OCHA)
 - iii. Dr. Dia Timmermans—Senior Health Advisor for the Joint Donor Team
 - d. USAID
 - i. Dr. Martin Swaka—Senior Program Management Specialist/Health
 - e. Non-governmental organizations and contractors
 - i. Dr. John Rumunu—Technical Director of MSH/SHTP II Project
 - ii. M&E officer with the Juba office of IMA
 - iii. Dr. Morris—Technical Director of the SHTP II/ JSI sub-project in WBeG state
2. CES: Mr. Jona Kenyi Manoah, State Surveillance Officer
 - a. Yei County: Mr. Michael Lugalla Nicholas, County Surveillance Officer
 - i. Yei hospital
 - ii. EPC PHCC

- iii. Lasu PHCC
 - iv. Kagelu PHCU
 - v. Undokari PHCU
- b. Morobo County: Mr. Anthony Ayuku Kwami, County Surveillance Officer
- i. Kimba PHCU
 - ii. Lujulo PHCU
 - iii. Aboroto PHCC
 - iv. Kaya PHCC
3. WBEG State—Dr. Archanglo Bambo Nela, Director General of the SMoH; Mr. John Baptist Abakar, State Surveillance Officer and Dr. Martin Mayen, National Public Health Focal Point
- a. Wau County: Mr. John Festo Abel Bunda, County Surveillance Officer
- i. Wau Teaching Hospital
 - ii. St. Daniel Comboni Catholic Hospital
 - iii. Eren PHCC
 - iv. Baggai PHCC
 - v. Khorogana PHCU
 - vi. Hai Bafra PHCU
- b. Jur River County: James Waal Baak, County Surveillance Officer
- i. Thercueng PHCC
 - ii. Mariah Ajieth PHCU
4. Warrap State—Director General of the SMoH; Mr. Deec Akot Deec, State Surveillance Officer; and the International Public Health Focal Point
- a. Twic County: Mr. Peter Mayiik, County Surveillance Officer
- i. Mother Theresa Hospital
 - ii. Wunrok PHCC
 - iii. Mayen Abun PHCC
 - iv. Titcock PHCU
 - v. Ajong PHCU
- b. Gogrial West County: Mr. Joseph Deng Deng, County Surveillance Officer
- i. Block 14 PHCU
 - ii. Gogrial PHCC
 - iii. Mayom PHCU

- iv. Kuajok PHCC
- 5. Jonglei State—Mr. John Deng Mayom, State Surveillance Officer; and Dr. Damene, WHO International Public Health Focal Point
 - a. Bor South County: Mr. Paul Riak, County Surveillance Officer
 - i. Bor State Hospital
 - ii. Lualdit PHCU
 - iii. Baidit PHCC
- 6. EES—Director General of the SMoH; Mr. Dominic Franco, State Public Health Officer; and the WHO International Public Health Focal Point
 - a. Torit County: Mr. Mathew Ohitai Ohide, County Surveillance Officer
 - i. Torit State Hospital
 - ii. Olere PHCU
 - iii. Nyong PHCC
 - iv. Kudo PHCC
 - v. Muttaram PHCU
 - b. Upper Nile State—Mr. Kur Amum Ajak, State Surveillance Officer; and Dr. Fazal Ather, International Public Health Focal Point
 - i. Malakal County: Mr Samuel Rita, County Surveillance Officer
 - ii. Malakal Teaching Hospital
 - iii. Malikia PHCC
 - iv. Bam PHCC
 - v. ECS PHCU

Annex I4: Documents reviewed

1. Background on South Sudan and its health system
 - a. Robert O. Collins, 2008. *A History of Modern Sudan*, Cambridge University Press
 - b. MoH, 2009. Basic Package of Health and Nutrition Services for Southern Sudan
 - c. MoH, 2010. Health Strategic Plan (2011–2015), Government of Southern Sudan, Ministry of Health, Draft of 1, September 2010
 - d. Sudan Centre for Census, Statistics and Evaluation (SCCSE), 2010. Statistical Yearbook for Southern Sudan, 2010
 - e. SCCSE, 2011. Key Indicators for Southern Sudan, 2011
2. IDSR technical guidelines and job aides
 - a. WHO/AFRO and CDC, 2005. Guide for the Use of Core Integrated Disease Surveillance and Response Indicators in the African Region
 - b. MoH and South Sudan office of WHO (WHO/SS), 2009. IDSR case definition banner (i.e. wall chart)
 - c. WHO/SS, 2011. IDSR support supervision checklist: state and county levels
 - d. WHO/SS, 2011. IDSR support supervision checklist for health facility level
 - e. WHO/SS, 2011. Epidemic Preparedness and Response Task Force: Terms of Reference
 - f. WHO/SS, 2011. Outbreak Investigation and Response Guidelines for South Sudan
3. Reporting forms
 - a. MoH, 2009. OPD daily patient register
 - b. MoH, 2009. Weekly reporting form
 - c. MoH, 2009. Monthly epidemiological report
 - d. MoH, 2009. Case-based investigation form
 - e. MoH, 2009. Line listing forms for AFP, VHF, measles, cholera, meningitis, AJS, avian influenza, neonatal tetanus,
4. IDSR training materials
 - a. MoH and WHO/SS, 2009. Modules 1 to 8
 - b. MoH and WHO/SS, 2009. Rapid Response Team training materials
5. IDSR strategy, work plans, and budgets
 - a. MoH and WHO/SS, 2007. IDSR Plan of Action for South Sudan, 2007–2008
 - b. USAID and WHO/SS, 2008. Scope of Work For Integrated Disease Surveillance and Response (project SOW for 2008–2009)
 - c. WHO/SS, 2008. Work plan for IDSR project—2008–2009 (project work plan and budget for 2008–2009)

- d. MoH, 2009. Memorandum from the Undersecretary of MoH-GoSS to the DGs of all SMOHs regarding “Building Disease Surveillance Structure in the States”
 - e. MoH and WHO/SS, 2009. Proposed Integrated Disease Surveillance and Response Action Plan (strategic plan for 2009–2013)
 - f. MoH, WHO/SS and USAID, 2009. Memorandum of Understanding (for the IDSR project)
 - g. USAID, 2009. WHO Consolidated Grant for FY 2010 (including the SOW and budget for the IDSR project for 2009–2010)
 - h. USAID and WHO/SS, 2010. Scope Of Work for Expansion of Integrated Disease Surveillance and Response in Southern Sudan (project SOW for 2010–2011)
 - i. WHO/SS, 2011. Summary of funding for surveillance activities from USAID and other donors, 2009–2011
6. IDSR project reports and monitoring documents
- a. USAID, 2008. Project Report (annual report on CDC-managed support to IDSR during October 2007–September 2008)
 - b. WHO/SS, 2009. Progress Report: Year 1; 4th Quarter 2008 and 1st, 2nd Quarter 2009 (report on the first three quarters of WHO-managed support for the IDSR project)
 - c. WHO/SS, IDSR-FY 2009 Final Report-Dec, 2010.pdf
 - d. WHO/SS, 2010. IDSR project second quarter report (January–March, 2010)
 - e. WHO/SS, 2010. IDSR project third quarter report (April–June 2010)
 - f. WHO/SS, 2010. IDSR annual report (October 2009–September 2010)
 - g. USAID, 2010. PIRS (performance report for the IDSR project for 2009–2010)
 - h. WHO/SS, 2011. IDSR project first quarter report (October–December 2010)
 - i. WHO/SS, 2011. IDSR project second quarter report (January–March 2011)
 - j. WHO/SS, 2011. IDSR project third quarter report (April–June 2011)
 - k. WHO/SS, 2011. IDSR Coverage and Support Staff (summarizing the deployment of Surveillance Officers as of May)
 - l. WHO/SS, 2011. IDSR Supply and Training Status (summarizing the deployment of Surveillance Officers as of September)
 - m. WHO/SS and MoH, 2011. Communicable Disease Surveillance and Response in South Sudan: Backgrounds, Achievements and Challenges (a PowerPoint presentation from the annual National IDSR Review Meeting of June 2011)
7. Data sets and logs
- a. Excel spreadsheets of weekly IDSR data submitted by the ten states for weeks 1 to 36 of 2011
 - b. Excel spreadsheet summarizing the completeness of weekly reports from all functional health facilities, weeks 1 to 36
 - c. The outbreak log of Warrap State, 2011

- d. The outbreak log of CES, 2011
 - e. The national outbreak log, 2011
 - f. The log of laboratory specimens sent to Kenya, 2011
 - g. The log of lab results returned from Kenya, 2011
8. Weekly epidemiologic bulletins
- a. MoH, 2010. Weeks 27, 41, 42, 43, 44, and 51
 - b. MoH, 2010. Weeks 13 and 14
9. Reports from previous evaluations of EWARN and IDSR
- a. WHO/SS, CDC, USAID, SARA, and UNFIP, 2003. The Implementation of Integrated Disease Surveillance and Response in the African and Eastern Mediterranean Regions: Synthesis Report
 - b. Senait Kebede on behalf of the MoH, 2007. Southern Sudan Integrated Disease Surveillance and Response Assessment Report (from the assessment of November 2006)
 - c. MoH and WHO/SS 2009. Evaluation for Integrated Disease Surveillance and Response in Southern Sudan, May 2009.
 - d. Martin Opoka (WHO/EMRO), Peter Mala (WHO/HQ) and Nadine Ezard (Independent consultant), 2011. Strengthening early detection of communicable disease outbreaks in the Integrated Disease Surveillance and Response system in South Sudan (report of a June 2011 assessment trip)