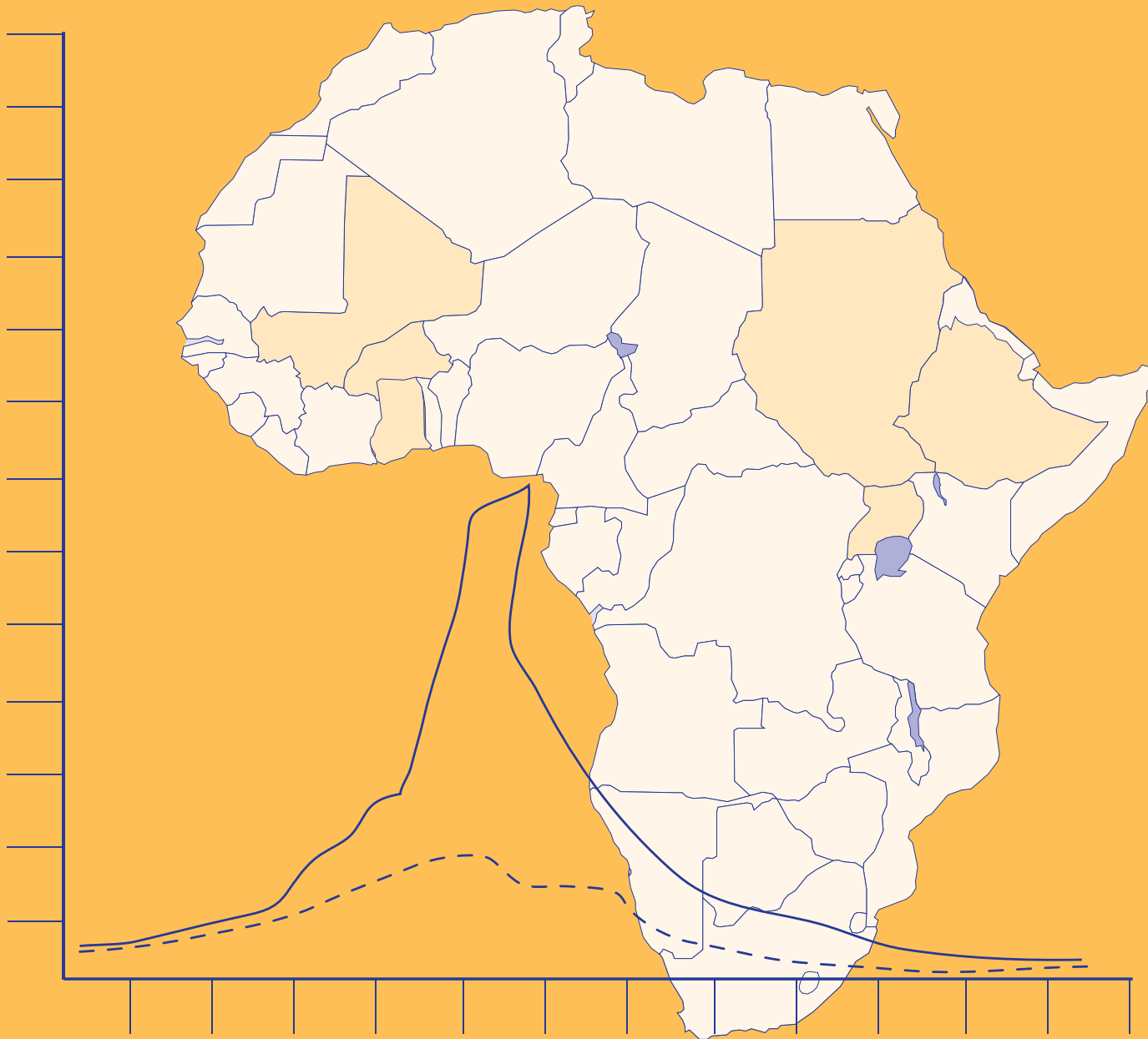


# Integrated Disease Surveillance and Response

## La Surveillance Intégrée et Riposte contre les Epidémies



Policy Briefs



# Integrated Disease Surveillance and Response



## Burkina Faso

### Background

**B**urkina Faso has been plagued with disease outbreaks in the past decade. Most recently, a new strain of meningitis emerged in 2002, resulting in over 1400 deaths. Prior to 1994 Burkina's surveillance systems addressed the specific needs of various vertical programs such as meningitis, polio, HIV/AIDS, malaria, and tuberculosis. These programs were disease specific and operated concurrently within the national surveillance system. This situation resulted in an overproduction of tools for data collection and reporting, lack of a coordinated national effort, and an overworked and undercompensated sector of health workers.

To address these weaknesses, the government of Burkina Faso restructured its national surveillance system in 1994 into central, regional, and district levels. All are coordinated by epidemiological units that respond to various disease outbreaks, analyze data, report to immediate supervisors, and subsequently implement epidemic responses. In 1998, Burkina Faso adopted an Integrated Disease

Surveillance and Response (IDSR) program to strengthen the existing national program. In November 2002, the World Health Organization's Regional Office for Africa (WHO/AFRO) sent a team to document the IDSR program's experiences and lessons learned.

### Findings and Major Results

The team found a marked improvement in the coordination of all surveillance activities, including better coordination of epidemiological information centers at both the regional and district levels. The team noted that several critical changes within the national system have strengthened Burkina's ability to respond to disease outbreaks. These included:

- ◆ Creating a new national public health laboratory and a national epidemic response committee;
- ◆ Strengthening the national laboratory through extensive training programs and the use of better tools for data collection and reporting;
- ◆ Posting highly educated and motivated epidemiologists in direct surveillance units at the regional and district levels, many of whom have taken training courses in intervention epidemiology; and
- ◆ Improving rapid epidemic response at the community level by equipping regional and district surveillance teams with radios.



Photo: WHO/TDR/Crump

## Lessons Learned

Despite these advances, Burkina Faso's national epidemic response system needs a more effective mechanism for coordinating between vertical programs and multiple partners. Several independently supported programs continue to carry out surveillance activities. Although a national committee exists, its authority to influence field activities in IDSR is limited. National-level program directors will need to share decision-making authority and budgets in order to scale up IDSR activities. IDSR activities have been effectively integrated at the regional and district levels, but greater effort is needed to make the national system more effective.



Photo: WHO/TDR/Crump

## Recommendations

- ◆ Empower the national committee and the national public health laboratory to respond to Burkina's epidemics in a more coordinated fashion;
- ◆ Accelerate the implementation of the IDSR plan of action, which would strengthen the surveillance and response capacities at central, intermediate, peripheral, and community levels;
- ◆ Expand the responsibilities of the IDSR department to include all infectious diseases (presently this department heavily emphasizes meningitis, polio, and measles);
- ◆ Ensure that the MOH has the technical and financial support necessary to implement the national plan of action; and
- ◆ Promote more effective integration and consensus of programs supported by different partners.

# Integrated Disease Surveillance and Response



## Ethiopia

### Background

Ethiopia has suffered severe social, political, and humanitarian crises that have deteriorated the health infrastructure, putting the health of the country's most vulnerable populations at risk. Communicable diseases, nutritional deficiency, and HIV/AIDS dominate Ethiopia's burden of disease. Largely preventable diseases, such as malaria, infectious diarrhea, and respiratory infections are common, and epidemic-prone diseases, such as meningococcal meningitis, cholera, measles, and bacillary dysentery, are chronic public health problems.

To meet this challenge, the public health system and other government sectors are becoming decentralized. In 1996, as part of the response to the growing public health problem with communicable diseases, Ethiopia introduced an Integrated Disease Surveillance and Response (IDSR) strategy focusing on 17 priority diseases. Ethiopia adopted the World Health Organization's IDSR strategy in 1998, and in October 1999, the Ministry of Health (MOH) of Ethiopia and its development

partners assessed the country's surveillance system and used the results to adapt a five-year national plan. It has been five years since the adoption of the national plan, and in November-December 2002, a team from WHO and the U.S. Centers for Disease Control and Prevention (CDC) visited Ethiopia to document successes, challenges, and lessons learned from Ethiopia's experience.

### Findings and Major Results

Ethiopia has made notable advances in communicable disease surveillance since adopting the IDSR strategy in 1996. Informants credited consistent and reliable political support as a significant contribution to IDSR implementation, especially at the national level. This support included the endorsement of national and regional plans of action and the establishment of a national IDSR unit in the MOH's Disease Prevention and Control Program. Dissemination of standard case definitions has taken place, and a quarterly bulletin is published with support from the polio eradication program and the Expanded Program on Immunization (EPI). The establishment of a national IDSR task force, the adaptation of technical guidelines, training materials, and modules, and the implementation of training activities at the national and regional levels have contributed to an overall improvement in data collection, analysis, and interpretation for public health action. Additional evidence of progress includes:

- ◆ **Increased awareness and use of IDSR indicators.** At the regional and national levels, officials are aware of indicators for case fatality ratio, timeliness and completeness of reporting, and thresholds for selected epidemic-prone

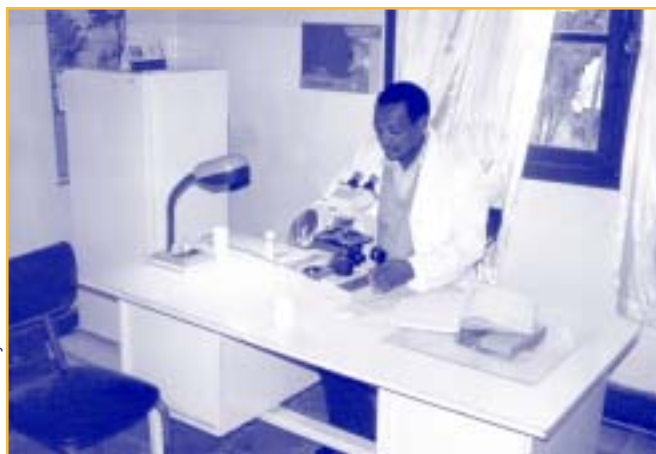


Photo: Harvey Nelson

diseases. Informants report being able to use the indicator results to cite specific areas of improvement, such as timely detection of outbreaks.

◆ **Improved integration efforts and coordination between IDSR and vertical programs.**

At the national and regional levels, disease control programs for EPI, polio, malaria, and tuberculosis share data, resources, transportation, and communication facilities. In an effort to integrate programs, the AFP/EPI bulletin has been renamed the AFP/EPI/IDSR Bulletin and is supported by WHO. The national IDSR team has established a national Emergency Response Task Force to coordinate response activities in famine-affected areas in Ethiopia.

- ◆ **Strengthened role of laboratories in surveillance and response.** Laboratories participate in coordination meetings and investigation activities with the surveillance teams at the national, regional, and district levels. In October 2002, an assessment of national public health laboratory capacity was carried out, and strengthening a laboratory network with emphasis on data and information sharing between the laboratories and surveillance units is a priority.

## Lessons Learned

Most of the IDSR activities have taken place at the national and regional levels. Awareness of IDSR at peripheral levels is low, and it is at these levels that technical guidelines, training manuals, and revised surveillance formats should be distributed. Resources and training support from the national level are necessary to ensure that activities can be implemented.

Further integration and coordination with vertical programs that includes promoting communication, building consensus, and evaluating progress would help to accelerate IDSR throughout the regions. A need also exists to consolidate data collection formats with those of the Health Management Information System. In addition, IDSR progress is hindered by the shortage of personnel at all levels, and difficult terrain and poor communication services have contributed to delays in transmission

of information and implementation of training and regional IDSR activities. Finally, activities are impacted by delays in receiving allocated resources from the national level and donor agencies.

## Recommendations

Recommendations for the national level focus on promoting approaches to maximize synergies between vertical programs and IDSR. Specific recommendations are to:

- ◆ Provide administrative support to the MOH and WHO and its partners to ensure a more timely release of government and donor funds to the different levels;
- ◆ Strengthen technical and supervisory support to the regional and district levels;
- ◆ Develop and promote strategies to address high attrition rate of personnel (e.g., for the short and intermediate terms, retrain personnel; for the long term, offer career opportunities, incentives, and transfers);
- ◆ Advocate to professional associations, non-governmental organizations (NGOs), and training institutions for assistance with IDSR implementation at the national and regional levels. The MOH should provide support for orientation, training, and funding;
- ◆ At the regional level, accelerate sensitization and orientation sessions for community-based organizations, NGOs, and local authorities and involve research institutions in IDSR assessments, planning, implementation, and monitoring and review of activities; and
- ◆ Provide supervisory and technical support to district offices and health facilities, including on-the-job orientation and skills development on the basics of IDSR.



# Integrated Disease Surveillance and Response



## Ghana

### Background

Communicable diseases, such as malaria, cholera, tuberculosis, and HIV, continue to be leading causes of death in Ghana. Yellow fever is endemic in Ghana, and reported cases of measles and neonatal tetanus are critical public health problems. In the past, disease elimination and eradication programs for Guinea worm, leprosy, and poliomyelitis provided resources for individual surveillance activities. However, these activities placed a burden on health workers who were asked to respond to separate vertical systems, especially at the peripheral and district levels.

In 1996-1997, Ghana experienced devastating outbreaks of meningococcal meningitis, cholera, and yellow fever. In response, health leaders in Ghana joined ministers of health from other African countries to call for improved surveillance capacity for early detection and rapid response to communicable disease threats.

In 1998, Ghana created a National Surveillance Unit (NSU) to coordinate the collection, collation, analysis, and dissemination of surveillance data for communicable diseases. In 2000, Ghana's Ministry of Health (MOH) assessed the surveillance system and developed a five-year national plan for strengthening the national system consistent with the Integrated Disease Surveillance and Response (IDSR) strategy adopted by the World Health Organization, Regional Office for Africa (WHO/AFRO) member states in September 1998. In November 2002, WHO and the U.S. Centers for Disease Control and Prevention (CDC) sent an international team to Ghana to document experiences and lessons learned during the implementation of Ghana's IDSR program.

### Findings and Major Results

The documentation team found that sensitization activities and the assessment of national surveillance, preparedness, and response systems have had a significant impact on the increased awareness of IDSR at the national, regional, and district levels. Informants cited an increase in the proportion of health facilities submitting their monthly reports on time from 30 percent before the surveillance assessment took place to 80 percent by the end of the assessment period. Similarly, an increase in the number of suspected yellow fever reports and timely investigations of suspected acute flaccid paralysis (AFP) cases was observed following surveillance orientation and sensitization. Additional efforts undertaken by national disease control programs to share common resources and structures have resulted in maximized resources for strengthening surveillance. For example:

- ◆ Disease control program managers and laboratory workers were involved in modifying the integrated surveillance monthly reporting form;



Photo: WHO/TDR/Clump



- ◆ Weekly and quarterly feedback bulletins are prepared by the NSU and the Expanded Program on Immunization (EPI);
- ◆ Standard case definitions have been adopted and disseminated for 23 priority diseases under surveillance;
- ◆ National laboratory workers participated in monthly surveillance meetings in Accra and in quarterly meetings with regional surveillance directors; and
- ◆ A principal biologist has been appointed as an IDSR activities coordinator at the national laboratory.

## Lessons Learned

Surveillance activities have progressed significantly through the implementation of IDSR, but much of the important work has taken place at the national level. A critical goal and major challenge is to bring technical skills and tools to the local level, where a need exists for concerted sensitization, orientation, and onsite training in basic surveillance principles and the use of adapted surveillance tools. This is especially important given high turnover rates at all levels. The formal coordination between programs, such as EPI and malaria, can support the integration of surveillance capacities and enhance production of common sensitization materials and feedback bulletins. Further, informants interviewed during the documentation activity recommended that

donors and high-level public health leaders adopt an integrated approach when new program activities are designed. Indeed, this is not an easy process, but it would facilitate and strengthen integration at the mid and peripheral levels.

## Recommendations

- ◆ Accelerate implementation of IDSR at the regional, district, and community levels;
- ◆ Regularly measure and evaluate the IDSR indicators to monitor progress towards an improved surveillance and response system;
- ◆ Accelerate training of surveillance personnel at the regional and district levels using onsite training whenever possible;
- ◆ Promote enhanced links between central, regional, and district laboratories through onsite technical supervision and the development of a standard internal quality control system;
- ◆ Encourage development of financial and non-financial incentives for retaining skilled health personnel and recruiting well-trained staff into IDSR activities;
- ◆ Develop an annual budget for outbreak investigation and response; and
- ◆ Promote a functional central supply office to ensure a consistent supply of good quality laboratory media and reagents to regional laboratories.

# *Integrated Disease Surveillance and Response*



## **Mali**

### **Background**

**T**he nation of Mali is situated within the meningitis belt of Africa and has consistently experienced outbreaks of meningitis and other epidemic-prone diseases. In 1995, a lethal meningitis epidemic resulted in over 11,000 documented cases and over 1,000 fatalities. The 1995 and 1996 cholera outbreaks in Mali resulted in 2,675 documented cases and caused almost 400 deaths, and a measles outbreak in 1998 resulted in over 10,000 cases and caused 35 deaths. Poor data analysis and interpretation of results, unclear guidelines and case definitions, dysfunctional epidemic committees, and a lack of a clear national strategy contributed to Mali's inability to respond effectively to these outbreaks.

To address this problem, the Malian Ministry of Health (MOH) adopted an Integrated Disease Surveillance and Response (IDSR) strategy in 1998 to strengthen the existing national program. Four years later, the World Health Organization's Regional Office for Africa (WHO/AFRO) conducted a documentation activity to describe successes, challenges, and opportunities for future IDSR implementation. A team from WHO, the U.S.

Centers for Disease Control and Prevention (CDC), and national program coordinators reviewed numerous regulatory texts, workplans, and reports and conducted field visits to hold qualitative focal group discussions and informal interviews with numerous national- and district-level health directors.

### **Findings and Major Results**

The team noted a structured framework for IDSR implementation in Mali and reported four major developments since 1998. First, an Epidemiological Disease Surveillance (EDS) unit was created to coordinate IDSR implementation. Second, a national public health reference laboratory was established and is actively engaged with the EDS unit. Third, the National Health Directorate (NHD) currently has a center for data processing and analysis that is operated by technical staff and equipped with more advanced electronic equipment. The NHD now has systems in place to routinely monitor data for quality control. Last, the IDSR communication system employs a radio network that transmits data on epidemic diseases and other communicable priority diseases. Although some areas of the country are still not covered by the radio network, coverage has been greatly improved since 1998.

Although Mali has developed a strategy to integrate the national systems, the team found that central-level health officers lacked a clear understanding of how to formulate an integrated approach. The MOH has not yet established a decentralized laboratory network, and the capacity of district-level laboratories is low and in dire need of technical and financial support. Private health facilities are not yet involved in surveillance activities, and WHO administrative processes have delayed implementation of the plan of action.



Photo: CDC





Photo: WHO/TDR/Grump

## Lessons Learned

With financial support from the MOH, the NHD has bought drugs and conducted a mass vaccination campaign. The NHD was restructured in 2001, putting Mali's disease surveillance programs under the responsibility of the Division for Public Health. This support has trickled down to community health centers and now allows officers-in-charge to manage disease outbreaks and send laboratory specimens to the central laboratory. This has greatly improved the coordination of different health programs. There are two districts—Niono and Kolondiéba—that have done particularly well in community surveillance and could serve as models for replication elsewhere.

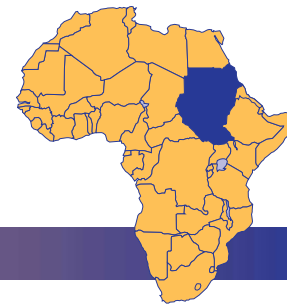
Additionally, collaboration between the public health schools and the IDSR training program has worked well to integrate IDSR training modules into the curricula.

## Recommendations

The team recommends that to coordinate Mali's IDSR activities better, a national laboratory network must be created and supported. The team also recommends scaling up the distribution of technical guidelines and tools for data collection and data analysis at the central and district levels and implementing a system to monitor the use of the guidelines. The team specifically recommended that the NHD:

- ◆ Integrate community surveillance into the national system;
- ◆ Mobilize resources to implement activities; and
- ◆ Organize a workshop to finalize the role of health centers within the IDSR system.

# *Integrated Disease Surveillance and Response*



## **Southern Sudan**

### **Background**

**S**udan is a country that has endured more than three decades of internal conflict, massive population displacement, repeated drought, and frequent disease outbreaks. The conflict has been mainly in Southern Sudan, which consists of the Bahr Ghazal, Equatoria, and Upper Nile regions. The health infrastructure has been largely destroyed; training of health workers has been disrupted; and most of those trained have either migrated or been displaced. The 1989 humanitarian crisis was one of the worst emergency situations in Sudan—an estimated two million people are believed to have died as a result of conflict, famine, and epidemic diseases. The situation was worse in Southern Sudan, where no central authority existed to coordinate response efforts. This crisis prompted the Government of Sudan, the Sudan's People

Liberation Movement (SPLM), and the United Nations to sign an agreement to deliver humanitarian aid under the Operation Lifeline Sudan (OLS) initiative. In 1998, the World Health Organization (WHO), building upon this agreement, established a Southern Sudan liaison office in Nairobi and a field office in Loki (Kenya).

Communicable diseases are the leading causes of health problems in Southern Sudan, accounting for significantly high rates of morbidity and mortality within the population. Epidemic diseases are frequent and, too often, the response is slow and the disease poorly diagnosed. On many occasions, thousands of lives were claimed and six months passed before any response was initiated. Prior to 1999, surveillance and response activities were conducted on an ad hoc basis and were poorly coordinated.

In 1998-1999, WHO, UNICEF/OLS, and the U.S. Centers for Disease Control and Prevention (CDC) sponsored field assessments on the health information system's (HIS) investigation and management practices and outbreak preparedness. The assessment revealed a need to create a more effective surveillance and response system. Accordingly, an early warning and response network (EWARN) was initiated in July 1999. In May 2000, the United Nations Foundation funded a three-year project to strengthen surveillance and response to epidemic-prone and vaccine-preventable diseases. In December 2002, a team of international experts, sponsored by WHO and CDC, documented the experiences and lessons learned from this project.



Photo: WHO/TDR/Crump

## Results

In general, EWARN has succeeded in bringing together various local and international partners to improve surveillance and response to epidemics by establishing a viable system. Thus, EWARN has succeeded in improving outbreak surveillance and response. These findings were consistent with earlier monitoring and field reviews and in agreement with the observations and beliefs of partners. The team observed that practical approaches were effective in initiating and establishing the system. These approaches included:

- ◆ Conducting needs assessment, advocacy, and sensitization that were incorporated into a project plan;
- ◆ Involving WHO/Southern Sudan directly in training, outbreak investigations, and confirmation and response and facilitating human and material resources, information analysis and dissemination, intervention planning, and feedback to partners;
- ◆ Engaging stakeholders (UNICEF/OLS, WHO, NGOs, and community-based organizations) and creating synergies in surveillance and response activities (training, alert, and response);
- ◆ Building local capacity in clinical and lab skills and establishing a laboratory referral network system supported by locally adapted courses and technical inputs from collaborating institutions, such as the African Medical and Research Foundation (AMREF), the Kenya Medical Research Institute (KEMRI), and the International Committee of the Red Cross (ICRC);
- ◆ Establishing practical communication channels and an alert system using high-frequency radio networks with simplified reporting tools and technical guidelines;
- ◆ Maintaining regular feedback and disseminating timely information for action using updates, field visits, and radio communication; and
- ◆ Ensuring a skilled and committed EWARN core staff.

Before the implementation of EWARN it took several months to detect, alert, verify, and respond to suspected outbreaks—at huge costs and many lives. Today it usually takes days and rarely more than two weeks. Overall, the project to strengthen surveillance and response using EWARN has succeeded despite the enormous challenges posed by Southern Sudan's physical, social, economic, and political landscape.

## Challenges

Despite these encouraging achievements, a number of major challenges remain. Sudan is still within a conflict zone and experiences chronic emergencies. Lack of strong central authority in the south and continued conflict threaten the consolidation and sustainability of gains. The limited number and precarious situation of health facilities, poor infrastructure, and inadequate funding make it difficult to access more areas for further expanding the system. Moreover, dependency of health services on humanitarian organizations and the rapid turnover of NGO and UN agency staff pose challenges that need to be addressed.

## Recommendations

- ◆ Consolidate and sustain gains and expand the system to more areas.
- ◆ Encourage international partners, particularly NGOs working in Southern Sudan, to recruit more South Sudanese health workers to decrease the rapid turnover of staff.
- ◆ Increase investments to improve basic health care delivery by supporting preservice and in-service training of health workers, making supplies available, and strengthening lab services.
- ◆ Support training school partnerships with technical and material inputs and integrate surveillance and response training into curricula.

# *Integrated Disease Surveillance and Response*



## **Uganda**

### **Background**

**L**ike many countries in sub-Saharan Africa, the Republic of Uganda experiences severe disease outbreaks that heavily impact the population and the health systems. The Ebola virus alone killed 224 people in 2001, and meningitis, yellow fever, typhoid, and malaria continue to afflict the Ugandan people.

In 1996, Uganda initiated an integrated approach to surveillance and response. Until this time, the national surveillance and response system used varying surveillance tools and lacked standard case definitions at the peripheral level and a functioning method for reporting. Moreover, the quality of data analysis at the district and health facility levels was questionable. Although epidemic management committees were in place in some districts, supervisory activities were irregular and not structured at any level. Two years later, in an effort to improve the situation, the Ugandan Ministry of Health (MOH) adopted the World Health Organization's Integrated Disease Surveillance and Response (IDSR) strategy and performed a nationwide assessment of its surveillance systems.

In late-2002, a team of three consultants (two epidemiologists and one laboratory expert) carried out an IDSR documentation activity in collaboration with a national counterpart. This activity aimed to document successes, challenges, and opportunities for IDSR implementation. The activity was primarily qualitative and consisted of discussions with focal groups, interviews, field visits, and document reviews.

### **Findings and Major Results**

Within the system, the team found great improvements in coordination and training and noted the use of new and updated materials. Selected sections of IDSR generic technical guidelines were initially adapted to provide the peripheral level with basic surveillance tools, such as standard case definitions, action thresholds, supervisory checklists, and reporting forms. The generic technical guidelines were then fully adapted, and other materials, such as job aids, laboratory guidelines, district-level planning guides for surveillance, and guidelines for rapid response to epidemics were produced.

Some training on integrated surveillance started before the adaptation of IDSR generic training modules in August 2002, first at the central level and then at the peripheral level. Following the adoption of the IDSR strategy, a series of regional workshops were held to sensitize district personnel, including laboratory workers. The Institute of Public Health has assisted the implementation of IDSR by



Photo: CDC



supporting training activities, data analysis, and epidemic investigations and helping to develop plans of actions. Laboratory personnel from all levels have been trained in outbreak investigation and diagnosis of cholera, meningitis, shigellosis, and typhoid. Moreover, all districts have established rapid response teams with members from various sectors.

A national Health Management Information System (HMIS)–IDSR joint committee meets monthly to coordinate surveillance activities between programs. A weekly newsletter and a quarterly feedback bulletin are published by the MOH and widely distributed. A national daily newspaper publishes data on cases and death from epidemic-prone diseases on a weekly basis. Meetings of district surveillance representatives are held every six months at the central level, with an award granted to the best performing district in terms of surveillance activities.

## Lessons Learned

The introduction of IDSR in Uganda has clearly strengthened district and MOH surveillance capacity, particularly for diarrhea disease outbreaks and other febrile diseases, such as Ebola. Because the vertical health programs have been hesitant in embracing IDSR implementation in Uganda, the IDSR committee has been instrumental in clarifying issues and building consensus.

The health subdistricts in Uganda are somewhat young, and as a result, the implementation of IDSR at the district level has been a considerable challenge. In addition, the private sector is not adequately participating in the reporting of surveillance data. Means of communications between levels are often not adequate, which can impede the smooth flow of information. Data management at the periphery level is weak, despite the availability of computer technology. Often, data management software is not standardized, so coordination between districts can be problematic.



Photo: CDC

## Recommendations

The IDSR committee should mobilize all stakeholders to:

- ◆ Support districts and subdistricts in building capacity in data analysis and outbreak investigation by recruiting and training personnel (e.g., clinicians, lab personnel, health educators, health inspectors, etc.) in surveillance strategies in order to ensure sustainability;
- ◆ Strengthen communication links between levels;
- ◆ Increase efforts on ensuring multisectoral outbreak responses;
- ◆ Sustain the weekly and quarterly feedback publications for advocacy and resource-mobilization purposes;
- ◆ Review and update the indicators through quarterly and annual monitoring and evaluation activities; and
- ◆ Consider the inclusion of HIV/AIDS in IDSR implementation.

# **SURVEILLANCE & RESPONSE CASE STUDIES**

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