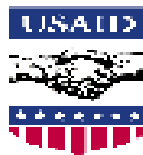
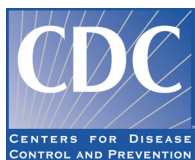




The Implementation of Integrated Disease Surveillance and Response in the African and Eastern Mediterranean Regions

Synthesis Report



WHO, CDC, USAID, SARA, UNFIP

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List of abbreviations acronyms

AFP	Acute Flaccid Paralysis
AFRO	African Region (WHO)
AIDS	Acquired Immune-Deficiency Syndrome
CBS	Community Based Surveillance
CDC	Centres for Disease Control and Prevention (USA)
CFR	Case Fatality Rate
CIDA	Canadian International Development Agency
CPHL	Central Public Health Laboratory
CSF	Cerebrospinal Fluid
CSM	Cerebrospinal Meningitis
DPC	Disease Prevention and Control officer (WHO)
EHF	Ebola Haemorrhagic Fever
EMRO	Eastern Mediterranean Region Office
EPI	Expanded Program of Immunization
ESD	Epidemiology and Surveillance Division
EU	European Union
EWARN	Early Warning and Response Network
HIP	Health Information Professional (WHO-Mali)
HIS	Health Information System
HIV	Human immune deficiency virus
HKI	Helen Keller International
HMIS	Health Management and Information System
HQ	WHO Headquarters in Geneva
IDS	Integrated Disease Surveillance
IDSR	Integrated Disease Surveillance and Response
IMCI	Integrated Management of Childhood Illnesses
KEMRI	Kenya Medical and Research Institute
Lab(s)	Laboratory (ies)
LP	Lumbar Puncture
MMWR	Mortality and Morbidity Weekly Report
MoH	Ministry of Health
MSF	Médecins Sans Frontières
NGOs	Non-governmental organisations
NNT	Neo Natal Tetanus
NPHL	National Public Health Laboratory
NSU	National Surveillance Unit
NTIC	New Technology of Information and Communication
PASEi	Projet d'Appui à la Surveillance Epidémiologique intégrée
PHR ^{plus}	Partners for Health Reform plus
PoA	Plan of action
RBM	Roll Back Malaria
RRT	Rapid Response Teams
SOPs	Standard Operating Procedures (lab)
STD	Sexually transmitted diseases
STI	Sexually Transmitted Infections
TI	Trans Isolate
UNF	United Nations Foundation
UNFIP	United Nations Foundation for International Partnership
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VHF	Viral Haemorrhagic Fever
WHO	World Health Organisation

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Summary

World Health Organization (WHO) in collaboration with partners conducted a process of documentation of the implementation of the Integrated Disease Surveillance and Response Strategy (IDSR) in five selected AFRO countries (Burkina Faso, Ethiopia, Ghana, Mali and Uganda), and its corollary EWAR in Southern Sudan (EMRO), from November 17 to 07 December 2002.

The main purpose of the documentation exercise was to document the lessons learned, successes, challenges and opportunities in the implementation of IDSR/EWAR in the countries with the aim of developing a framework to scale up IDSR implementation in the African Region and other WHO Regions. The documentation also allows the development and field-testing of methodologies for countries to adapt and use in documenting the implementation of IDSR in their respective countries. This synthesis report summaries the methodologies employed, the main findings in the six AFRO and EMRO countries, describing the IDSR implementation approaches, the implementation of the planned activities in terms of inputs, results and outcomes. In addition, the application of the IDSR principles, conclusion and recommendations are presented.

1. Introduction

Communicable diseases are the most common causes of death, disability and illness in the African Region (AFR) and Eastern Mediterranean Region (EMR). Developing effective and efficient national surveillance and response/control systems is important for national, regional and global health security. During the 48th session of the World Health Organization Regional Committee for Africa, held in Harare in September 1998, Member States adopted the Integrated Disease Surveillance (IDS) as a regional strategy for early detection for timely and efficacious response to priority communicable diseases. The vision of IDS is to establish an effective national surveillance system that will generate information for timely action. The Eastern Mediterranean Region (EMR) likewise recommended the use of an integrated approach to communicable disease surveillance and control during the Regional Committee Meeting in 2000.

In line with the emphasis on «information for action», and recognizing the critical link between surveillance and response, WHO and partners are providing support to African, Eastern Mediterranean (EMR) and South East Asian (SEAR) countries for the implementation of what is now called Integrated Disease Surveillance and Response (IDSR) activities. Through this strategy, integration and synergy of existing surveillance systems is envisaged as applicable at all levels of the health system, particularly at the district. As of 31 December 2002, 35 countries in the African Region have assessed national surveillance; epidemic preparedness and response systems of which 32 have used the findings to prepare a multi-year strategic IDSR plan. In addition, 23 countries have prepared national IDSR technical guidelines based on the WHO-generic technical guidelines. In addition, eight countries have launched training of district health personnel on IDSR.

Partners such as USAID and UNFIP consortium (UNF, Rockefeller and the Gates Foundations) are financially supporting implementation of IDSR in the African and Eastern Mediterranean Regions. The long standing collaboration between WHO and the Centers for Disease Control and Prevention has been extended to the IDSR, resulting in the development of instruments, tools and guidelines.

In order to document lessons learnt, successes, challenges, constraints and opportunities in the implementation of IDSR a documentation exercise was undertaken in selected countries. The purpose of this documentation is to describe the various models applied and share experiences with other countries and regions. An additional goal is the development of strategies for scaling up IDSR implementation in Member States.

Six countries were selected for this documentation exercise among which, five (Burkina Faso, Ethiopia, Ghana, Mali and Uganda) are from the African Region and one, Southern Sudan from Eastern Mediterranean Region. «UNFIP supported countries» include Burkina Faso, Ghana, Mali and Southern Sudan. The «Early Implementers» of IDSR, supported by USAID include Ethiopia and Uganda. Each country has adapted IDSR implementation to its own situation; For example, southern Sudan has employed EWARN (Early Warning and Response Network) as a mechanism for implementing IDSR. Criteria for selecting the countries included:

- Availability of funding for IDSR implementation;
- Prior major outbreaks;

- Existence of field epidemiology training;
- Context (complex emergency situation);
- Perceived achievements in IDSR implementation;
- Laboratory strengthening activities;
- French speaking and English speaking countries.

Table 1: Selected countries and selection criteria

Countries	Language	Selection Criteria
Burkina Faso	French	Major outbreak of meningitis Donor interest
Ethiopia	English	Donor interest Implementation difficulties
Ghana	English	Donor interest Field epidemiology training
Mali	French	Good perceived achievement
Southern Sudan	English	Complex emergency situation Only EMRO country Running early warning and response system (EWARN)
Uganda	English	Perceived achievements Field epidemiology training Major outbreak (Ebola)

1.1 Objectives

General Objective

To obtain information on inputs, processes, outputs and outcomes for strategic improvement of IDSR implementation in the African Region, and EWARN process in Southern Sudan.

Specific Objectives

To describe and document:

- The process of IDSR implementation;
- The application of IDSR principles;
- Successes related to IDSR implementation;
- Constraints and challenges faced in the process of implementation and;
- Draw recommendations for further improvement.

1.2 Expected outcomes

Short-term:

- Report describing and reviewing approaches to IDSR implementation;
- Country briefs with summaries of selected findings and recommendations.

Long term:

- Framework for enhancing and scaling up IDSR implementation;
- Policy briefs for regional and global consumption;
- Generic multimedia presentations (e.g. Power Point presentations) on the results of the documentation exercise;

- Presentation of initial results to the global consultation on IDSR;
- Presentation of the results to the IDSR Task Force.

2. Methods

The documentation process employed principally qualitative approach, but also drawing from quantitative information from documents made available to the documentation teams. The methods of data collection included:

- 1) Thematic interviews with “Key Informants”;
- 2) Focus group discussions;
- 3) Document Reviews;
- 4) Observation.

In each country these methods were followed to collect the information at central, regional, district, and health facility levels. The targets for these activities included persons in a variety of roles, including policymakers, technical implementers and laboratory workers, as well as epidemiologists. Key informant interviews and focus group discussions were used at the central level, at least in one intermediate level, and at least in two peripheral levels. A number of documents and reports on various aspects of health, disease surveillance and response were also reviewed in each country.

3. Findings from the documentation teams

3.1. IDSR Sensitisation process

Political leaders as well as stakeholders and the development partners (multilateral and bilateral cooperation, NGOs...) assisting the Ministry of Health were sensitised and has favourably welcomed the IDSR strategy. Some of them also took part in the various activities of the sensitisation process.

It is important to notice that the IDSR strategy is not considered as a new health programme, but rather as a way to reinforce the health system efforts in the control of priority communicable diseases.

IDSR sensitization activities have occurred at the national, regional and district levels. National and regional level officials were aware of IDSR and had played active roles in its implementation. Formal meetings of surveillance focal person, other training sessions, and visits are used to relay messages. Participants of these sessions included clinicians, health managers, and community-level health workers and volunteers. Emphasis is on orientation of health workers on surveillance and response, case definitions and reporting of epidemic-prone diseases.

Most participants met by the documentation teams mentioned that they are aware of integrated disease surveillance and response activities and some have participated in sensitization and assessment activities. According to one participant, the assessment itself has contributed to

sensitization on integrated disease surveillance and response. Participants are aware of the basic facts on surveillance and response. They also believe that the sensitization and orientation activities have improved awareness of clinicians on reporting of suspected outbreaks. According to a comment made by a key informant: “The sensitization is the biggest improvement. Clinicians are more aware that they need to report certain conditions”.

As a result of the sensitisation, and the engagement of countries in the IDSR process, a number of IDSR organisational bodies were set up in the countries:

- A National IDSR Coordination Committee with the mission of carrying out activities aimed at developing the strategy and ensuring the monitoring of its implementation. Varying from country to country, the coordination committee include but is not limited to: the National Director of Health, the National Health Information System, the National Surveillance Unit, the National Reference/Laboratory Network, the National coordinators of health programmes (EPI, MAL, IMCI, HIV/AIDS...), the training institutions and in some cases the Armed Forces Health Services. In some cases, major health partners are also members of the coordination committee (WHO, UNICEF, USAID, EU, Global 2000, HKI...);
- A Technical Working Group on integrated disease surveillance, under the responsibility of the coordination committee comprising the Director of national surveillance unit, the Director of the Health Information System, the health Programme coordinators, the Director of the National Reference Laboratory, and the training institutions...

Although efforts to sensitize at various levels are encouraging, participants identified gaps in the understanding of surveillance case definitions by workers at the facility level. For example, surveillance case definitions designed to be sensitive and simple to apply have been met with some resistance on the part of clinicians. Some participants are concerned that sensitive case definitions would lead to over reporting levels that would overwhelm the district’s ability to investigate.

3.2. Assessment of national surveillance systems

Following the sensitisation process, the Ministries of Health with technical and financial support from WHO, United Nations Funds for International Partnership (UNFIP), CDC or USAID, conducted in each country a qualitative and quantitative initial assessment of the existing surveillance system. The assessment involved the active participation of central, regional, peripheral health officers, laboratory officers, various health programme officers and the partners of the Ministry of Health. The assessment concerned the surveillance system as well as the laboratory component and the communication network for data transmission.

Findings of this initial assessment showed the existence of various vertical surveillance systems (leading to the existence of multiple reporting forms), without coordination or few collaboration with the national surveillance unit. It also showed a weak laboratory network to support the surveillance system in the confirmation of aetiological agents. Data collected are not always

adequately analysed and utilised at the peripheral levels to guide the response to epidemics. Moreover information collected is not timely transmitted and is often not complete.

Based on the findings of this assessment countries have developed a five-years strategic plan and one to three years plans of action for IDSR implementation.

Each country has also identified a list of 17 to 23 selected priority diseases to be monitored by the surveillance system. These priority diseases include:

- Diseases to be eradicated: poliomyelitis and dracunculosis;
- Diseases to be eliminated: leprosy, neonatal tetanus, and trachoma;
- Epidemic prone diseases: meningitis, measles, cholera, yellow fever, shigellosis;
- Diseases of major public health importance: malaria, HIV/AIDS/STIs, tuberculosis, onchocerciasis, schistosomiasis, hepatitis B and trypanosomiasis.

The recommendations made at the end of the evaluation served as a platform for the continuation of the process. They concern epidemiological surveillance, laboratory, case management, epidemic preparation and response, training and supervision.

In Southern Sudan, due to the civil war, combating epidemics has been a great challenge. From May to July 1999, two consultants were commissioned by WHO to review the existing disease surveillance, to assist in the establishment of an early warning and response network and, to assess the availability and adequacy of materials and supplies for effective response.

The assessment revealed that the poor physical infrastructure, the weak administration framework and the occurrence of natural disasters such as famine and floods was major constraints to disease control activities and early response to epidemics. This was further compounded by chronically neglected and ruined health infrastructures.

The lab capacity in the four areas (Loki, Tambura, Wau/Mapel and Rumbek) was also assessed in collaboration with AMREF. Training of health (including lab) workers has been severely disrupted. Labs were poorly equipped and supplied and, inefficient methods were employed. No internal or external quality control was in place, leading to unreliable test results. The assessment showed an urgent need to improve basic diagnostic systems in primary health care, and to set up an effective lab network to address common disease outbreaks.

After the completion of the assessment and the recommendations for the establishment of EWARN in Southern Sudan, WHO and UNICEF/OLS undertook sensitisation activities. EWARN discussed and agreed upon with all NGOs in the health sector, counterparts and local communities. WHO also developed orientation guidelines with input from a working committee comprising NGOs operating in Southern Sudan. There are also regular monthly meetings of all stakeholders for information sharing. In addition, WHO Southern Sudan is also involved in continuous sensitisation of all partners to ensure their continuing support to EWARN.

3.3 Development of plans of action

The results from the assessment were used by each country to develop a five-year national plan of action (PoA) for integrated disease surveillance (IDS). The plans were based on a consensus on issues of conflicting nature involving various stakeholders. The MoH, WHO, other partners and the various health programs as well as district level health workers and political leaders were part of the development of this PoA. The development of the PoA was an important event because it helped bring all partners together and brought opportunities for increased funding of IDS. Through collaboration with WHO, support for IDSR implementation was obtained from UNFIP (Burkina, Ghana, Guinea, Mali), CDC (Ghana, Uganda), USAID (Ethiopia, Uganda).

Regional and district levels were aware of this national PoA and had incorporated its objectives into their own annual plans for surveillance and response.

In Southern Sudan, following funding of EWARN by the UNFIP in March 2000, a Steering Committee was set up at WHO Head Quarters (HQ) in Geneva, involving all the key clusters, departments and teams involved in the operationalisation of activities. The first step in the process have been the development of a joint implementation plan, with all stakeholders in the region (including government and non-government controlled areas), to agree on activities, indicators, resource allocation, as well as division of responsibilities, mechanisms of reporting and transfer of funds. The implementation plan (2001-2002) was agreed upon and developed jointly by all key players in a meeting in Khartoum in March 2000.

3.4 Adaptation of IDSR technical guidelines

The generic technical guidelines proposed by WHO was adapted to the countries' specificities. The adaptation was done through workshops that brought together MoH officials, surveillance officers, data managers, health programme officers, clinicians, laboratory technicians, peripheral level care providers and partners from the Ministry of Health. Adapted guidelines were then printed and disseminated to all health facilities for IDSR implementation. The IDSR technical guideline comprises 8 sections listed below:

Section 1.0	Identify cases of priority diseases and conditions;
Section 2.0	Report priority diseases and conditions;
Section 3.0	Analyze data;
Section 4.0	Investigate suspected outbreaks and other public health problems;
Section 5.0	Respond to outbreaks and other public health problems;
Section 6.0	Provide feedback;
Section 7.0	Evaluate and improve surveillance and response;
Section 8.0	Summary guidelines for specific priority diseases and conditions.

The guide is considered by most stakeholders as the main instrument to support the rationalization of surveillance activities mainly at the peripheral level. In some countries, the technical guidelines have been used to develop a separate smaller booklet focused on surveillance of selected priority epidemic-prone diseases. Before its final adoption, some countries conducted a field-testing of the adapted technical guidelines at district level (Ghana, Mali). The field test was meant to an appropriation of the tools by peripheral level health workers.

Particular to Uganda and during the first years of IDSR implementation (2000-2001), as opposed to adapting the whole of the IDSR generic technical guidelines, Uganda embarked on adapting sub-sections of the IDSR technical guidelines that were urgently required to support IDSR implementation at the lower levels (e.g. the case definitions and action thresholds, supervisory checklist, reporting forms etc..). These formed the job aids for immediate use. Other job aids like data analysis tools and laboratory guidelines have also been extracted from the generic guidelines. The case definition and action threshold, the supervisory checklist, and reporting forms were distributed to all health facilities country wide within the first year of implementation of IDSR. In addition, other job aids, not necessarily in the IDSR generic guidelines, but which were deemed to be necessary to support IDSR implementation at the district level were also produced. These include a planning guide for surveillance at district level, guideline for rapid response to epidemics, checklist for rapid response kits etc... It was only during the second year of implementation (June 2002) that Uganda finally adapted the IDSR generic technical guidelines.

Funds for printing and dissemination of the national guidelines were made available to countries by WHO and its partners including UNFIP, USAID, CDC, *PHRplus* and UNICEF.

In Southern Sudan, based on the results of the assessments, which showed the need for rapid reporting of possible outbreaks (but not for a large network of reporting cases on a weekly basis, which was deemed not feasible); a technical guideline (including reporting forms) was developed in 1999. The EWARN technical guideline described a system of surveillance and response based on a network of teams in as many counties as possible. The network utilise a radio based surveillance of epidemic episodes for early investigation and prompt response to contain any identified outbreak.

3.5 Adaptation of IDSR training modules

Training modules are to be adapted to country specificities in conformity with the technical guidelines from which they emanate. The content should be in line of the national guidelines and or any other reference document used at the national level. The IDSR training modules include a set of 8 training modules listed below:

- Module 1.0: Introduction;
- Module 2.0: Detect priority diseases;
- Module 3.0: Analyze and interpret data on priority diseases;
- Module 4.0: Investigate and respond to suspected outbreaks;
- Module 5.0: Epidemic preparedness;
- Module 6.0: Investigate and respond to other priority diseases;
- Module 7.0: Supervise and give feedback;
- Module 8.0: Monitor and evaluate.

As recommended by WHO, in most countries, training institutions have played a crucial role in the adaptation of training modules. It was felt crucial during the adaptation of training modules to include the national health training institutions (medical schools and nursing schools). In order

for the IDSR strategy to be sustainable it is important to institutionalize it as baseline training for the future health personnel in their respective school's curricula. Thus in all countries engaged in the adaptation process, the department of public health or epidemiology/statistics, and the nursing schools are involved as national trainers and/or regional trainers (where these schools are at regional level). Like during the adaptation of technical guidelines, national health programme officers have largely participated and contributed to the adaptation of training modules. For each programme it was important to make sure that the future training modules were conform to their programme objectives and directives.

The adaptation of training modules was followed by the elaboration of a national IDSR training plan which details how the health personnel will be trained from national to district level personnel. Often, a cascade training strategy was used in which core teams initially trained at the central level trained regional and district health teams, which in turn trained peripheral (health facility) level health workers. All categories, from doctor to health assistants were involved in the training.

It is important to mention that apart from the training of health personnel, laboratory technicians have received training on specific modules for aetiological confirmation of priority diseases (specimen collection, storage and transportation of samples, bio-security, basic laboratory techniques for the diagnosis of epidemic prone diseases etc...). The training of lab technicians was conducted through the national laboratory network.

In Southern Sudan, a specific training manual for health workers, including clinicians, lab technicians, county health coordinators and counterparts was developed in 2000. Since then, more than 150 health workers have been given 1-3 weeks trainings. Cumulative experience from these trainings has shown the need for scaling up the ongoing in-service training to access more health workers and more areas; to target middle level and primary health care workers (as these are closer to the communities); to involve county EWARD teams, local health workers and previous trainees (to reinforce skills and motivate participation); and, to simplify the manual for wider use. As a result, the manual was revised in 2002.

3.6 Implementation of IDSR Plans of Action

3.6.1 Inputs

Inputs for IDSR implementation include financial as well as human and material resources. In addition, organizational structure including surveillance and laboratory units, the existence of logistics, EPR and training plans were also considered as inputs. Above all, political commitment at higher level of the Ministry of health officials was also considered as an important input in different countries.

Financial resources declared by countries to the documentation teams were provided by WHO and various partners as can be seen in table 1 below. Although not listed in the table below, financial resources often come from AFP/EPI and other vertical programme (RBM, PASEi/CIDA...).

Table 2: Financial resources at country level to support IDSR implementation in 2001-2002

Country	Source and amount of funds
Burkina Faso	<ul style="list-style-type: none"> - UNF: US\$ 275,000 - National budget: US\$ 30,000 - UNICEF: € 400,000 - WHO:? - PASEi/CIDA:?
Ethiopia	<ul style="list-style-type: none"> - US\$ 4,700,000 - WHO:?
Ghana	<ul style="list-style-type: none"> - UNF: US\$ 275,000 - WHO:?
Mali	<ul style="list-style-type: none"> - UNF: US\$ 275,000 - National budget: US\$ 10,000 - WHO:? - PASEi/CIDA:?
Uganda	<ul style="list-style-type: none"> - National budget: US\$ 280,000 - WHO biennium: US\$ 210,000 - WHO/EPI: US\$ 400,000 - USAID: US\$ 456,000

Material resources included the procurement of computers, printers, fax machines, modems and equipment for internet connection. These materials were provided to the national surveillance units and national reference laboratories as well as some regional and district level surveillance units. Radio communication equipment was also provided to some remote health facilities to improve data transmission and strengthen the national communication network. For countries such as Ethiopia, Ghana and Guinea, WHO country offices have provided vehicles to strengthen the implementation of IDSR activities. Laboratory reagents and equipment were also procured to countries.

Financial resources allocated directly to countries had allowed these to print and disseminate technical guidelines, data collection and reporting forms.

Human resources at the national level include an IDSR team leader, usually the Director of national surveillance unit, who works in close relationship with the DPC or the EPI, the IDSR focal person at WHO country office. In addition, regional and district levels also have an IDSR focal person. To strengthen capacity of human resources, health personnel as well as laboratory technicians were trained or sensitised. For example, as of the end of first quarter 2003, Burkina Faso has trained 110 laboratory technicians and 1233 health personnel in the country. All 13 regions and 53 districts, and at least one person in every single health facility received the

training on IDSR. On the other hand, Mali has trained 235 health personnel in 12 districts of 4 selected regions.

In Southern Sudan, human resources of EWARN consist of an epidemiologist (team leader), three public health regional coordinators, an administrative assistant, a radio-operator, two logistic support personnel and a driver. EWARN can access other human, material and financial resources from other programs functioning in Southern Sudan such as Polio/AFP, UNICEF/OLS and NGOs. They also facilitate the movement of EWARN staff for investigation, collection and transportation of samples, communication in terms of reporting and filling the questionnaire by radio, and verifying suspected outbreaks. They are also involved in the development of EWARN training modules and training activities. Lab equipments, which are required for outbreak investigation and response, are supplied by WHO Southern Sudan in collaboration with AMREF.

3.6.2 Outputs

As a result of the sensitisation, countries have constituted a National IDSR Coordination Committee and a National Working Group, along with the Epidemic Management Committee, the Rapid Response Team and the National Laboratory Network, already existing in some countries.

After adaptation, the technical guidelines including data collection and reporting forms (case-based, weekly, monthly or quarterly forms) have been printed and distributed to health facilities. Aside from the IDSR technical guidelines, some countries, Ethiopia, Ghana, Uganda and Southern Sudan have developed a pocket-sized booklet on standard case definitions for priority diseases. Weekly, monthly or quarterly IDSR feedback bulletins were developed in some countries, the most regular one being the weekly IDS bulletin on epidemic-prone diseases. Example Burkina, Ghana, Mali, Uganda and Southern Sudan publish a weekly newsletter distributed as a feedback bulletin to districts, and disseminated electronically to partners including WHO/AFRO and HQ. Outstanding is the publication by Uganda every Monday in *The New Vision*, a national daily newspaper, of the weekly number of cases and deaths on 10 selected priority diseases (malaria, cholera, dysentery, meningitis, measles, typhoid fever, AFP, NNT, Animal bites, guinea worm and others). Monthly and quarterly bulletins usually include also detailed description of epidemic investigation and management, and EPI and other programme activities.

As a result of the EPR plan, emergency drugs and laboratory reagents have been purchased and pre positioned at district level. This has allowed in Burkina Faso for example, an early detection and laboratory confirmation of meningococcal meningitis epidemic due to serogroup W135 in 2002. It was noted some progress in laboratory-based surveillance and implication of the laboratory in epidemic investigation on the field. But the system is still weak at peripheral levels (district and regional labs), because of the lack of supplies, reagents, equipment and trained laboratory technicians in addition to a weak infrastructure. There was everywhere at country level, an effort to revitalize laboratory sector through the creation of national laboratory networks and training of lab technicians.

Timeliness and completeness of reporting have increased following the sensitisation and dissemination of data collection forms. These indicators are used to monitor submission of weekly and monthly surveillance data. Before IDSR, health personnel used to submit data figures without looking at them. Now they know the importance of figures and use them to guide the decision in responding to suspected outbreaks and/or confirmed epidemics. Action thresholds are regularly calculated at district level in order to rapidly detect any epidemic situation.

In villages where there is a lack of health facility, a community-based surveillance (CBS) network is being implemented with the support of WHO and partners such as UNICEF, in order to detect and report any suspected case of priority diseases. The CBS system uses the community-based case definitions included in the IDSR technical guidelines. In Uganda for example this system is coupled with the registration of new births and deaths in the villages (vital statistics records).

The development of the national communication system through procurement and installation of radio communication equipment in remote health facilities, had also contributed to improve the completeness and timeliness of reporting at country level. Through the procurement and installation of computers with email connections at the national surveillance units, the national reference laboratories and some regional and district surveillance units, countries are now part of the global network of the New Technology of Information and Communication (NTIC), sharing and receiving surveillance information worldwide.

3.6.3 Outcomes

A major impact of IDSR implementation at national level can be measured through the capacity of the system to quickly detect the epidemics and to organise an immediate and effective response at regional and district levels. During the visit of the documentation teams in November and December 2002, most countries were at the stage of adaptation of training modules. Only Mali, Uganda and Southern Sudan have effectively trained some districts' health personnel. Thus, the stage of implementation of the IDSR plan of action does not really allow for measuring its impact. However, in the case of Burkina Faso for example, and due to prior IDSR sensitization efforts, and procurement of laboratory reagents and specimen transport media, it has been possible to detect and laboratory confirm an epidemic of meningococcal meningitis due principally to *Neisseria meningitidis* W135 serogroup at an earlier stage (during the first 2-3 weeks of the 2002 epidemic), avoiding a costly and needless mass immunisation with an A/C meningococcal vaccine and orienting the response strategies toward case management with effective antibiotics.

The identification of an AFP case due to a wild poliovirus in July 2002, at the end of the meningitis epidemic in Burkina Faso, showed again the capacity of the system to operate even in emergency situations.

During the most recent suspected outbreak of viral haemorrhagic fever (VHF) in Southern Sudan, the response has been launched within the 48 hours. Serious outbreaks such as VHF and meningitis now pose less threat because of the presence of EWARN.

EWARN data are also used for local planning in assessment of population at risk, prevalence and incidence measures and for use in pre positioning of drugs and supplies before the epidemic. County level analyses are used for planning purposes. The use of indicators helped in planning for other disease outbreaks and control at all levels.

Coordination of verification and response has also been strengthened. Thus, in 2001 alone, more than 30 organisations have participated in the detection and response efforts. Furthermore, UNICEF/OLS provides vaccines, drugs and other supplies during outbreaks based exclusively on information and request received from EWARN.

The coordination and integration resulting from IDSR implementation have minimized the gaps and differences between persons from different organizations (MoH, WHO and other stakeholders) and between programs in MoH.

The laboratory has been more and more involved in outbreak investigation, resulting in early confirmation and consequently early response to outbreaks. In Uganda for example, 80% of outbreaks in 2001 and 2002 so far have been lab confirmed.

There has been a marked improvement in the timeliness and completeness of reporting. For example in Uganda, only 2% of districts were reporting to the central level in 1998, 11% in 2000, 18% in 2001 and over 65% in 2002.

The district level analysis of surveillance data has improved as it can be seen by the presence of graphs on disease trends in some districts. IDSR has helped district level officers (the district management team) to understand the concept of surveillance and response, and be more proactive in willingness to carry out district level activities in a team spirit. There is now a system to collect, and analyse data, to send lab specimens at national level for aetiological confirmation, and submit report. The district management team is more motivated to work together with the community and its leaders.

3.6.4 Monitoring and evaluation

At this stage of the implementation process, although planned, a monitoring and evaluation mechanism does not yet exist. Where it is conducted, national teams join regional and district teams to conduct supervisory visits of lower levels. Depending on countries, the national level conducts this integrated supervision activity two to four times a year. Regional and district levels conduct supervision activities more often.

But at regional levels, two Mid-term Review Meetings of UNFIP supported countries, were held in Accra, Ghana, from 29 January to 01 February 2002, and in Nairobi, Kenya, from 10 to 12 December 2002. The objectives of the Meetings were to review the implementation of the UNFIP projects and plan for the next phase of implementation of the project. Accordingly, the progresses of IDSR/EWARN were presented and the PoA were reviewed for the remaining months of the project.

In Southern Sudan, in September 2001, a team from WHO/HQ and WHO SS Office has conducted field assessment and review of EWARN. The mission observed encouraging progress and suggested ways of further strengthening local EWARN. Considering the difficult access in Southern Sudan, strengthening of county-level EWARN teams was noted as appropriate for timely reporting and responding to outbreaks of diseases.

In February 2001, an additional review of EWARN was also conducted through a joint review and planning meeting held in Khartoum. At the meeting, areas of emphasis were identified both in government controlled and non-controlled areas. Accordingly, plans were developed for both areas, which were focusing on building local capacity, epidemic preparedness, expanding networking, and enhancing monitoring and supervision. To ensure timely implementation, general annual plan (for both areas), and detailed quarterly plans and annual monitoring tools/benchmarks were developed.

3.7 Coordination and Integration

Efforts have been made with the creation at national level of coordination committees bringing together national directors, programme managers, lab technicians and partners, yet these committees do not have a real decisional influence. But, there are shared perceptions and understandings of concepts, a cross-cutting support for implementation of IDSR, and interest to further promote and strengthen integration at various levels and among different programs.

Although the potential of integrated approaches was appreciated at all levels, IDSR was generally perceived as an approach to strengthening surveillance and response, not as a separate program *per se*.

Coordination among some vertical programs has contributed to strengthen IDSR implementation in countries such as Ghana. In particular, there are close ties between EPI and IDSR. Resources for AFP surveillance help support the quarterly meetings of the regional surveillance teams. And beyond that, standards for AFP surveillance generally provide motivation for improvement of surveillance, particularly with respect to timeliness and completeness. EPI also supports publication of quarterly bulletins, which focus on AFP but also include information about other diseases. Further, EPI received approximately 22 vehicles for polio eradication, which may also be used to assist with surveillance for priority diseases.

In addition, there are other examples of contributions from vertical programs to an integrated approach:

- Malaria laboratory training conducted at the regional laboratories is not only enhancing laboratory capacity to diagnose malaria but is helping to bring up the overall level of laboratory competence.
- Resources for yellow fever were also used to create fact sheets on other diseases besides yellow fever.
- The implementation of so-called second generation HIV/AIDS surveillance may present opportunities for surveillance integration.

The various programs, work in harmony to resolve problem that arise because of genuine need of specific programs for additional data. In Ghana and Uganda for example, funds allocated for

surveillance in various programs are channelled to the national surveillance unit, which also serves as a secretariat to the coordination committee.

The role of WHO-Country Office has been instrumental in strengthening IDSR implementation. WHO has technically supported the whole process of IDSR from the initial assessment to the implementation. It also had a catalysing role in the coordination and integration of IDSR activities by the MoH and partners.

4. Success stories

4.1 Burkina Faso – early laboratory confirmation of serogroup W135 meningococcal meningitis epidemic in 2002 of such a large scale for the first time

The last 2002 meningitis epidemic in Burkina Faso, allowed for developing a very close coordination between the laboratory and the surveillance. The importance of this coordination is well known today and consolidated at all levels as one participant said: *“it is through a national laboratory that, contrary to all expectations, the confirmation of the implication of the W 135 strain in the epidemic has been established, changing forever the profile of the epidemic meningitis in Burkina Faso and the meningitis belt”*.

4.2 Ghana - use of IDSR thresholds to detect and respond to an outbreak of meningitis in the district of Bolgatanga in November 2002

Early detection and laboratory confirmation of a meningococcal meningitis outbreak using IDSR indicators prompted the rapid implementation of a meningococcal vaccination campaign in the Bolgatanga district of northeast Ghana in November, 2002.

On November 16, 2002, a meningitis outbreak was reported in one sub district (population, 30,000) of the Bolgatanga district, Upper East Region. Bolgatanga district public health officials recognized that the meningitis alert threshold of 5 cases 100 000 per week had been crossed in that sub district. Latex agglutination of CSF for meningococcal serogroups was consistent with serogroup A at the Upper East Regional Laboratory. Two trans-isolate (TI) bottles with CSF have been sent to the regional and national laboratories for culture. On the basis of preliminary laboratory testing and CSM cases exceeding threshold levels, a serogroup A meningococcal vaccination campaign was initiated in this sub district on November 18. This vaccination effort began only 2 days after the meningitis cases passed the outbreak threshold.

4.3 Ghana - improvement in the timeliness of laboratory sample submission following quarterly IDSR meetings

Between 2000 and 2002, the timeliness of stool specimens collected as part of acute flaccid paralysis (AFP) surveillance in the Upper West Region of Ghana has improved from 68% to 100%. This improvement represents progress towards the IDSR goal of effective coordination among laboratorians and surveillance teams.

AFP surveillance in Ghana is done as part of the polio eradication campaign. The investigation of any case of AFP must include collection of 2 stool specimens for polio virus testing within 14 days of case reporting. Certification of polio eradication requires timely collection of 100% of stool samples from all AFP cases. During 2000 and 2001, in Ghana's Upper West Region, the proportion of stool samples from AFP cases collected within 14 days was 69% and 78%, respectively. The failure of this region to meet the target identified for polio eradication was one of the subjects of a quarterly surveillance meeting in March, 2001. These quarterly meetings are new since the implementation of IDSR in Ghana, and have involved surveillance officers from the national and regional levels and national public health laboratorians in an effort to improve coordination between the laboratory and the surveillance unit. Participants at this quarterly meeting discussed potential solutions to the lack of timeliness of submission of AFP stool specimens from the Upper West region, including clinician and community sensitization, coordination of transport, and improved communication with the national laboratory. In 2002, 100% of AFP cases in the Upper West Region have had adequate stool specimen collection within 14 days as can be seen in table 2 below.

Table 3: AFP Surveillance indicators in Upper West Region, Ghana, 2000-2002

AFP Surveillance Indicators	2000	2001	2002
Number of AFP Cases	34	25	21
Number of AFP cases with 2 stool specimens in <14 days	23	19	21 (100 %)
Number of AFP cases with 60 day follow-up	33	25	14*

* 7 cases were not yet due for 60 day follow-up at the time of this story

4.4 Uganda - The epidemic of Ebola Haemorrhagic Fever (EHF): August 2000-January 2001

On October 8, 2000, an outbreak of an unusual febrile illness with occasional haemorrhage and significant mortality was reported to the MoH by the superintendent of Lacor Hospital, and the District Director of Health Services in the Gulu District. A preliminary assessment conducted by the MoH found additional cases in the community and in Gulu Hospital, the regional referral hospital. On October 15, suspicion of EHF was confirmed when the Ebola virus was identified among specimen from patients including health workers at the hospital. This story briefly describes the successful epidemic response mounted by the MoH, health workers at various levels, and the community.

At the time when the superintendent and the staffs of the Lacor Hospital decided to inform the MoH (Oct 8), they were suspecting VHF. A team was dispatched from the national level to travel to the area and investigate the outbreak. The multidisciplinary team which included a clinician, epidemiologist and a lab technologist confirmed the presence of the epidemic and investigated other cases in the area and nearby communities. A blood specimen was collected and transported, using appropriate techniques, and was submitted to a WHO collaborating lab in South Africa for confirmation of the epidemic. This confirmation was obtained in Oct 14.

The Government took immediate action in making press statements and in alerting all districts. It also sought assistance from the international community in its fight against the epidemic. At the district level the whole community was mobilised, with every sector being involved in the search of potential cases and following up contacts of cases for at least three weeks to ensure that they do not transmit the infection to others.

During the third week of October, active surveillance was established and included a case definition with four categories: alert, suspect, probable and confirmed. The alert category comprised persons with sudden onset of high fever, sudden death, or haemorrhage, and was used by community members to alert health workers. The suspect category comprised persons with fever and contact with a potential case-patient; persons with unexplained bleeding; persons with fever and three or more specified symptoms (i.e., headache, vomiting, anorexia, diarrhoea, weakness or severe fatigue, abdominal pain, body aches or joint pains, difficulty swallowing, difficulty breathing, and hiccups), and all unexplained deaths. Mobile surveillance teams used the suspect category to determine whether a patient required transport to an isolation ward. The probable category included persons who met these criteria and were assessed and reported by a physician. Lab-confirmed cases were defined as patients who met the surveillance case definition and were positive for the antigen or antibody test in the lab.

By Jan 23, 2001, 425 presumptive cases with 224 deaths attributed to EHF were recorded from three districts in Uganda (Gulu, Masindi, and Mbarara). Epidemiological investigations identified the three most important means of transmission as attending funerals of presumptive EHF cases where ritual contact with deceased occurred, and intrafamilial or nosocomial transmission.

Successful elimination of community transmission of EHF was possible by the recognition of the outbreak, initiation of case finding, case isolation and other infection-control practices, and hospitalisation of identified case-patients in medical facilities where barrier nursing (e.g., wearing personal protective clothing) and other infection-control procedures were implemented. Concerted health education of the community about the dangers of contact with cases and deceased patients, establishment of specialized burial teams, and increased awareness of the disease among health workers were also instrumental in controlling the epidemic.

The successful control of the Ebola epidemic has shown the importance of surveillance and early warning systems in prevention, early detection and containment of the epidemic. Specifically, it showed:

- The need for community alertness in order to detect any emerging or re-emerging health problem in time
- The importance of immediate response and early notification of epidemic-prone or unusual health conditions
- The effectiveness of coordinated, multidisciplinary and inter-sectoral response to an epidemic
- The requirement for regular and coordinated dissemination of information to the public and health workers

(Source: MMWR 2001; 50 (5); IDS Bulletin March 2001)

4.5 Uganda - Weekly epidemiological reporting system in a national daily Newspaper

Uganda is probably one of the first in Africa and the less developed world to produce and publish a weekly epidemiological newsletter and the publication of a summary of the report every Monday on a national daily newspaper (*The New Vision*) to raise public awareness on epidemic preparedness, inform and give feedback to health workers who are instrumental in collecting the surveillance data.

The MoH established a system of reporting on epidemic-prone diseases on a weekly basis in Uganda in late 1998. This arrangement allowed tracking and forecasting epidemics in the country, and respond timely when they occur. Districts report to the centre on the number of cases and deaths of suspected epidemic-prone diseases on a weekly basis. This reporting system covers the entire 56 districts of the country. The list of reported diseases was expanded from the original five to 12 notifiable diseases (AFP, cholera, neonatal tetanus, meningitis, dysentery, measles, malaria, guinea worm, rabies, plague, typhoid fever and yellow fever).

An EPI-INFO database set up in the ESD allows the description of the occurrence and monitoring of trends on key notifiable diseases. This database is updated on a weekly basis as the reports from the district are received. It contains the number of cases and deaths reported per week. From the database, it is possible to detect outbreaks and abnormal trends, and monitor trends of CFR for the diseases. It is also possible to project the likely epidemiological situation of the country in the near future based on the available data.

The database is regularly analysed by the ESD statistician and as the results are published in a form of a Weekly Epidemiological Newsletter and disseminated to all concerned. Through the commendable initiative of the ESD the data on the newsletter is also published weekly on a newspaper with countrywide circulation. This has resulted in the sensitisation of all sectors of the population to surveillance, epidemic preparedness and response. Some countries of the African Region are planning to start a similar weekly feedback and dissemination system soon, having learnt from the successful experience of Uganda.

4.6 Uganda - Lab networking: Analysis of drug sensitivity

Following the implementation of IDSR lab networking has been functional since June 2001. Since then a number of districts have sent samples to the CPHL. The samples have been processed and antibiotic sensitivity tests performed.

The following table shows the enteric bacterial pathogens reported by the CPHL from the samples.

Table 4: Antimicrobial sensitivity of enteric bacterial pathogens with epidemic potential in Uganda, 2001-2

Pathogen	No of samples	COT	AMP	TET	CHL	NAL	CIP	ERY
<i>Shigella dysenteriae</i> type 1	9	0	0	0	2	3	3	-
<i>Shigella flexner</i>	21	0	1	0	1	21	21	-
<i>Vibrio cholerae</i> Inaba	9	0	0	7	0	1	7	7
<i>Vibrio cholerae</i> Ogawa	24	0	0	24	0	0	24	24
<i>Salmonella enteritidis</i>	26	0	0	0	0	26	26	-

<i>Salmonella typhi</i>	3	0	0	1	3	0	3	-
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COT: Cotrimoxazole; AMP: Ampicillin; TET: Tetracycline; CHL: Chloramphenicol; NAL: Nalidixic acid; CIP: Ciprofloxacin; ERY: Erythromycin. Source: CPHL-MoH;

Cotrimoxazole and ampicillin are no more effective probably because of their easy availability to the public. Other than cholera, tetracycline is also ineffective. Although chloramphenicol showed activity against *S. typhi*, its poor inhibition of *S. enteritidis* is of concern. Thus, it is necessary to differentiate between *S. typhi* and other salmonellae whenever salmonellosis is considered as a diagnosis.

These results had contributed to the formulation an effective policy for the MoH.
(Source: *IDS/Health Information Bulletin, WHO-Uganda, September 2002*)

4.7. Southern Sudan - Response to suspected VHF in Yambio, Western Equatoria in January 2001

On January 30, 2001 WHO Southern Sudan office in Loki and Nairobi received a report from the public health coordinator for Equatoria in Yambio of a 28 year old male Sudanese merchant admitted to Yambio Hospital with complaints of severe headache, neck ache, generalised bleeding, cough, fever and sweating. The above symptoms were reported to have started three days before admission. On direct questioning the patient was also found to have loss of appetite and yellowish urine. Relatives also reported a history of travel to Uganda.

Given the symptoms and the travel history, the patient was immediately managed in isolation and contacts put under surveillance. Immediate arrangements were made with Kenya Medical and Research Institute (KEMRI) for virologists to leave for Yambio. The team left for Yambio on 31st January with protective clothing for the hospital and diagnostic equipment. The team was joined in Loki with the EWARN WHO epidemiologists.

The following were done in Yambio: training of staff on barrier nursing and case management, epidemiological investigation, public information, and, collection of specimen from the patient and contacts. The samples collected from the patient were immediately shipped to KEMRI Nairobi and flown to the National Institute of Virology (NIV) South Africa. The specimens were all negative for Ebola, Marburg, Crimean Congo Haemorrhagic Fevers, Rift Valley Fever, Lassa and Hantaviruses, which ruled out VHF.

The EWARN system has shown that its link to the global response network has proved to be very useful and supportive. The international response team in this case was fielded within 24 hours after receiving the information. It showed the prompt reactivity of EWARN in Southern Sudan.
(*WHO SS Health Update Technical Jan 2001*)

5. Discussion

There is a need for countries to make a large investment of time and effort in implementing the IDSR strategy. Sensitization efforts, adaptation of guidelines and tools, training sessions,

meetings of surveillance and lab personnel have raised awareness and led to improvements in timeliness and completeness of reporting.

While there has been significant progress in surveillance activities through the implementation of IDSR, much of the important work has taken place at the national level. A critical goal and major remaining challenge is bringing these guidelines to the peripheral levels. There is a need for continuous and concerted sensitization and orientation on basic principles of surveillance and on the use of adapted tools at all levels.

Where IDSR/EWARN training was conducted, there is a need to regularly supervise the trained personnel, and to evaluate the performance of the surveillance system by using IDSR core indicators. Informal opportunities for on-site training should be taken wherever possible. Some of the more useful sensitization activities involved direct communication with clinicians and other health workers with information that was relevant to their setting.

Limited access to remote communities is a major challenge due to the poor transportation network and absence of telephone communication. However, the availability of radio network remains an effective tool to bridge the gap in communication.

The flexibility of other programs to accommodate and provide time for IDSR sensitization (like EPI, IMCI and Malaria) is an example that can be maximized to promote the concept of integration through various venues. This could be extended to formal coordination in areas like production of joint sensitization materials and feedback bulletins.

The challenges for public health laboratory system mirror those of the surveillance network: strengthening lab capacity and bringing lab training to the peripheral levels. Implementation of IDSR has resulted in a close connection between surveillance and lab at the national level. Laboratory strengthening programs initiated by vertical programs, such as recent district-level malaria lab training programs, are another potential opportunity for improving lab capacity to confirm other priority diseases.

The directive at the national level to use resources of programs for moving forward surveillance efforts, while at the same time ensuring that their needs are addressed, is a positive development. However, there are some areas of concern highlighted by participants of the various discussions. According to participants, the integration should be more at higher levels starting from donors, national programs and even at WHO country and regional offices. The participants recommend that different programs need to consider an integrated approach right from the design of program activities. This would facilitate and strengthen integration at the mid and peripheral levels.

There are ongoing efforts by political leaders to strengthen coordination and integration, seen at regional and district levels, and a move to produce integrated feedback bulletins and utilize common resources at the national level. However, more work is needed to improve technical level coordination and integration at MoH level through regular consultation and technical reviews of plans and performance status, among programs, like IDSR, EPI, HMIS, Malaria, IMCI etc. More attention is needed to ensure minimal duplication of information-gathering at

facility level (which burdens health workers, and negatively impacts data quality and timeliness). At the same time, it is important not to lose the positive momentum of vertical programs.

6. Conclusion

The documentation exercise shown that IDSR/EWARN implementation has improved the detection, reporting, investigation, lab confirmation, and response to outbreaks. It has enabled to measure the various stakeholders' interest in the continuation of the process. But there is a need to speed up the process, moving from national to peripheral level implementation by building capacity at these levels through a proven mechanism of training, supervision and feedback. Partners are supporting the process; it's up to the MoH to do everything possible to speed the implementation of their operational plans of action.

7. Recommendations

To health authorities

- Ensure that the technical guidelines and reporting forms are printed and distributed widely, including to private and military health sectors.
- Shift focus of IDSR implementation from national to regional and district levels, and on evaluation of IDSR core indicators.
- Strengthen capacity by increasing formal and on-site training of surveillance personnel at regional and district level.
- Promote community based surveillance to increase detection of outbreaks in the villages with no access to health facilities.
- Strengthen links between central, regional, and district laboratories, especially in terms of regular, on-site formative supervision and instructions in shipping and transport of specimens.

To health partners

- Provide the Ministries of Health with technical and financial supports to speed up the implementation of IDSR.
- Promote a fair integration policy for a better coordination among national disease control programmes financed by various partners, and collaboration between partners interested in IDSR strategy.
- Support and establish partnerships with training schools as this an important step to reach more health workers working in remote areas. Thus, this partnership needs to be fully

supported through technical and material inputs to training schools, and work towards integrating surveillance and response training into curricula.

- More efforts should be done to train/orient the staff of NGOs in epidemic preparedness and response in order for them to participate fully in EWARN.