

## TRAINED DISTRICT HEALTH PERSONNEL AND THE PERFORMANCE OF INTEGRATED DISEASE SURVEILLANCE IN THE WHO AFRICAN REGION

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### Abstract

**Background:** African countries have intensified in-service training on Integrated Disease Surveillance and Response (IDSR) for district and facility health personnel to strengthen their disease surveillance systems. Eight countries evaluated their experiences and lessons in the implementation of IDSR.

**Methodology:** We conducted a secondary analysis of the evaluation reports to assess the impact of training of district health personnel on the performance of disease surveillance systems. We developed indicators to assess the potential impact of their training on the timeliness and completeness of reporting, the data analysis of priority diseases at the district and health facility levels and supervision and feedback at the district level

**Findings:** Training approaches implemented included cascade, on-job, pre-service and fast track training on detection, reporting and data analysis. The overall proportion of health facilities with one or two personnel trained varied from 52% to 89% and the knowledge of the health personnel for epidemic-prone diseases ranged from 52% to 78%. All the countries met the threshold of 60% of health personnel in their districts trained in IDSR. The evidence from data analysis at the district level was more than 60% and the timely reporting and completeness of health facilities 70% and 92%, respectively. Supervision of health facilities ranged from 75% to 100%, however feedback was not provided on a regular basis

**Conclusions:** Trained district personnel are key in the performance of the national IDSR. This review shows that training of district health personnel coupled with sustainable supervision and feedback, reliable communication and availability of simplified reporting tools can contribute to improved performance of national diseases surveillance systems.

### Background

Ministers of Health participating in the 48<sup>th</sup> World Health Organization Regional Committee for Africa adopted a regional strategy on Integrated Disease Surveillance in 1998. The committee requested that the WHO regional office, in close collaboration with technical partners and donors, assist all 46 countries in establishing an operational integrated disease surveillance and response (IDSR) system within ten years. This should enable the countries to control diseases, and predict and contain epidemics to reduce the high rates of disability, illness and death caused by communicable diseases. Nineteen priority diseases and conditions were proposed for integrated surveillance.

Within the framework for implementation of this resolution, Ministries of Health conducted an evaluation of their surveillance systems supported by WHO and other partners. The key findings included: (i) poor data collection and analysis and (ii) low utilization of generated information particularly at the district level. The reasons given for inefficient surveillance include lack of standard case definitions, multiple reporting forms, insufficient laboratory support and health personnel poorly trained in disease surveillance issues. As a result, the opportunity to take action with a timely and appropriate public health response was often missed. Therefore, a need to strengthen disease surveillance through an integrated approach was identified as a priority. Generic technical guidelines and training materials on IDSR for district health personnel were developed by the WHO Regional Office for Africa in close collaboration with CDC-Atlanta. These tools were made available to countries for adaptation to their own needs.

Technical support was provided to countries for the development of a plan to intensify in- and pre-service training of health personnel on the IDSR approach. The adapted material was used to train health personnel. Through the established Regional IDSR Task Force, donor partners were sensitized to the need for providing financial support for the implementation of the integrated diseases surveillance strategy.

District health personnel knowledge about both the national priority diseases and the threshold for an epidemic is essential for timely detection of priority diseases thus improving timeliness and completeness in reporting. From 2000 until the present time, 43 out of the 46 countries in the WHO African region are implementing the IDSR strategy and 33 have trained health workers on IDSR in at least 60% of their districts. In these countries, district health teams and health facility workers have been provided with skills to conduct surveillance and to detect diseases using standard case definitions and to report national priority diseases with reporting forms recommended in the national guidelines.

Between 2004 and 2007 eight countries, with the support of WHO and other partners, have re-evaluated their surveillance systems at the end of their first five-year strategic plan to assess progress in the implementation of IDSR and to guide planning for the future. Few studies have addressed the impact of training on surveillance system performance. The purpose of this paper is to review and analyze the findings of these evaluations with a focus on the training of health personnel in IDSR approaches and how that can contribute to strengthening national disease surveillance systems.

### Methodology

We reviewed IDSR evaluation reports retrospectively from eight countries: Cape Verde, Eritrea, Ethiopia, The Gambia, Guinea Bissau, Lesotho, Malawi and Uganda. These evaluations were conducted

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between October 2004 and September 2007 by staff of national ministries of health and WHO consultants. The IDSR evaluation guidelines were used to identify districts and health facilities for inclusion in the evaluation. Data from the surveyed districts and health facilities were obtained either using a staged sampling technique or random sampling, except for Lesotho where convenient sampling was used. Table 1 summarizes the percentage of districts evaluated in each country.

Table 1: Year of evaluation and districts selected for the evaluation of IDSR by Country

Country	Year of evaluation	Number of districts in the country	Number of districts selected	Percentage of districts selected
Eritrea	2004	56	10	18
Ethiopia	2005	586	59	10
Malawi	2006	27	8	30
Gambia	2004	37	6	16
Guinea-Bissau	2007	10	3	30
Uganda	2004	56	20	36
Cape Verde	2007	17	7	41
Lesotho	2004	18	3	17

### Data analysis

We developed a list of indicators based on the training received by the health personnel to assess the potential impact of their training on the timeliness and completeness of reporting, data analysis of priority diseases at district and health facility levels, supervision and feedback at district level. The key indicators assessed included the quality of data contained in the health facility registers, the knowledge of case definitions of priority diseases, the initial analysis of the data collected, the frequency of supervision by the district health team and the timeliness and completeness of reporting from health facilities. EPIINFO 3.4.1 was used for data management and analysis.

### Findings

The approaches used to train health personnel on IDSR included cascade training, on-the-job training and pre-service training. Health personnel were also trained in data management and epidemiological surveillance techniques. In Malawi, 87% of district health personnel were trained in both data management and the IDSR approach, 50% had a separate training session on data analysis and 62% on epidemic management(2). In Guinea Bissau, all of the health personnel interviewed received additional training on supervision techniques of epidemiological surveillance(6). Additionally, they received training on data management and epidemiological surveillance. In all countries, fast track training on detection, reporting and data analysis in expanded programme of immunization target diseases was conducted for district and health facility personnel.

Although information on funding of training activities in the eight countries was not systematically collected, the regional office provided technical

assistance and funding for inter-country training of trainers only. All training activities in these countries were funded through the use of existing national resources from programmes (e.g. EPI, malaria), direct donors grant and/or WHO country programme support.

### Districts

The training of district health teams aims to provide skill on priority disease detection, analysis of data (organizing, summarizing/presenting data using tables, charts, graphs and maps, analyzing and interpreting disease surveillance data and drawing conclusions and recommendations for public health action), investigation of epidemics and other priority diseases, preparation for outbreaks, supervision and providing feedback.

Seven out of eight countries met the threshold of having trained health personnel in IDSR in 60% of the districts (Figure 1). This threshold is set to monitor implementation of the training of IDSR at the country level. No data were available for Guinea Bissau. In two countries (The Gambia and Cape Verde), all of the selected districts had trained health personnel. In these two countries the evidence of data analysis at the district level was 68% (ranging from 50% to 86%). In The Gambia the data analysis is done essentially by time (trend) to detect potential epidemics rather than by person (age and sex) and by place (geographical distribution)(1). In Cape Verde, 71% of the districts were performing analysis by place and person(3).

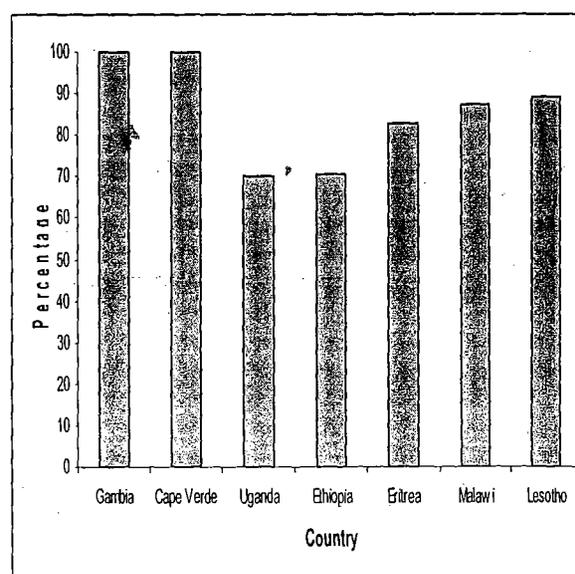


Figure 1: Distribution of districts with trained health personnel in the countries evaluated

The mean proportion of districts performing data analysis in the rest of the countries was 63%. In Uganda, 70% of the districts were performing data analysis, 40% were analyzing data by time and place and 30% by person only(5). In Ethiopia, 70% of the districts had at least one person trained in IDSR and in 53% of those there was evidence of data analysis on priority diseases(8). The proportion of districts in Guinea Bissau with evidence of data analysis by time was 75%(6) and

the evidence of data analysis by time was found in all districts in Eritrea(4).

Timeliness and completeness of reporting (Figure 2): Data on timeliness and completeness were not available for Ethiopia, Malawi or Lesotho. For the other countries, the mean proportion of districts with evidence of timeliness in reporting was 85%, slightly higher than the IDSR recommended 80% threshold for timeliness of reporting. The proportion of districts that reported on time in the Gambia increased by 47% between 2003 and 2004(1). In Cape Verde there was an increase of 100% compared with the baseline survey conducted in 2002(3). In Uganda, the proportion of districts with timely reporting had increased by 75% since 2001(5). In Eritrea, where 83% of districts had trained health personnel, both the evidence of data analysis by time and the actual timeliness of reporting at district level were 100%(4).

The mean proportion of districts with evidence of completeness in data reporting was 92%. This was higher than the IDSR recommended threshold of 80% for completeness of reporting. In Cape Verde the proportion of districts with evidence of completeness in weekly reporting was found to be high at 95%, an increase of 24% compared with the baseline survey conducted in 2002(3). In Guinea Bissau and Uganda, the proportion of districts with completeness in reporting was 84% and 95%, respectively(6, 5). This proportion increased by 98% in Uganda between 2001 and 2004(5).

In Lesotho, more than two health staff were trained per district using only the IDSR module on detecting and reporting priority diseases and they were also trained on EPI target diseases. Despite Lesotho having a high proportion (89%) of districts with trained health personnel, the IDSR performance was found to be poor. The reporting was neither complete nor done regularly according to the recommended national reporting schedule in any of the districts. There was no analysis of data of priority diseases at district and health facilities(7).

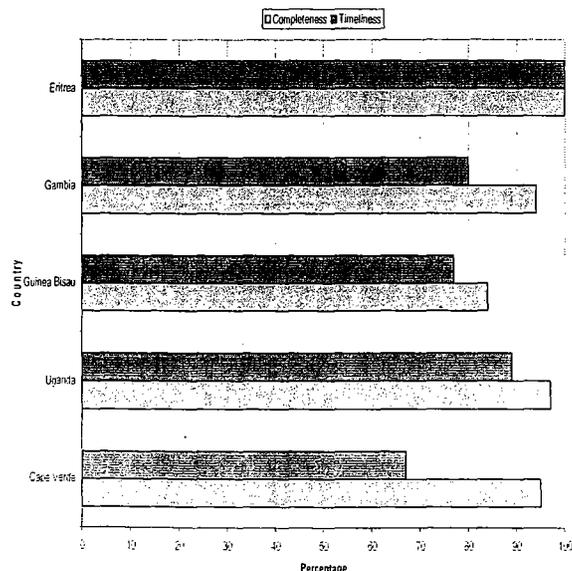


Figure 2: Timeliness and completeness in reporting by district in the countries evaluated

### Health facility

All countries met the threshold of at least two health personnel trained in the IDSR approach at the health facility level. This threshold was set for the purpose of monitoring the process of implementation of the in-service training in IDSR. In the health facilities where clinical registers were available (more than 95% of those surveyed), there was evidence that these registers were correctly completed in all health facilities in Cape Verde(3). This proportion is 83% and 74% of health facilities in Malawi and The Gambia, respectively(2, 1). In The Gambia, where 89% of health facilities had one or two personnel trained and 11% had more than five personnel trained, 52% of the personnel in health facilities had knowledge of the threshold for diseases with epidemic potential. Data analysis was done in 33% of health facilities(1).

In Eritrea, the proportion of health facilities with one or two staff trained in IDSR was 52%, and 23% had more than three personnel trained. The health facility personnel knowledge about epidemic threshold was more than 60% and the knowledge of national priority disease case definition was 95%. Nearly 70% of health facilities had a "trend line" displayed for at least one of the priority diseases(4).

In Ethiopia, 78% of personnel in the health care facilities surveyed had knowledge of the acute flaccid paralysis (AFP) threshold and 33% knew the threshold for meningococcal meningitis. Data analysis was done in 53% of health facilities surveyed(8). In Malawi, data analysis was done in 70% of health facilities; however, analysis by place was only done in 40% of the health facilities(2). In Uganda, 47% of the health facilities were performing data analysis; this proportion was only 10% in 2001(5). In Cape Verde, only 20% of health facilities performed analysis by time, place and person(3).

Supervision and feedback to health facility personnel is essential to increase the performance of IDSR in the surveyed countries. District focal surveillance persons received training on supervision and feedback, including the development of a feedback bulletin. Other training sessions were conducted to strengthen supervisory skills. As a result, in Cape Verde and The Gambia, 80% and 100% of health facilities received supervision from the district level, respectively(3, 1). In Eritrea, nearly 77% of health facilities were visited at least once in 2003 and 55% received the four quarterly feedback bulletins(4). In Malawi, 75% of the districts performed supervisory visits to health facilities at least once every three months(2). In Uganda, 55% of districts sent feedback to sub-districts and health facilities(5). In Ethiopia, health facilities received at least two supervision visits in the three months prior to the survey(8).

### Discussion

This retrospective review, although descriptive, suggests that training of health personnel contributed to the improvement of timeliness and completeness in reporting priority diseases in the evaluated countries. Correctly completed registers suggest improved detection of priority diseases and the quality of the data collected. All these countries overcame the challenge of

reaching the health facility level in just three to four years following the implementation of training in IDSR. The increase of the timeliness in reporting at the district level varied from one country to another (ranging from 47% to 100%) and suggests that well trained health personnel is key for the performance of IDSR. This achievement is likely due to the sustained commitment of the health facility personnel who are also in charge of providing patient care. In a case study on disease surveillance of poliomyelitis in Niger, lack of trained and committed staff was documented as a critical factor hampering disease surveillance(10).

All the training approaches used in the evaluated countries aimed to provide skills to personnel in the detection, data analysis and reporting of priority diseases at districts and health facilities. It is likely that well established district supportive supervision that addresses the knowledge of facility health personnel on priority diseases detection (including epidemic threshold) and data analysis and reporting may sustain the surveillance performance in these countries.

For optimal performance of diseases surveillance, training should be combined with the implementation of other strategic components of IDSR, including strong coordination, efficient communication and building laboratory capacity for case confirmation. The availability of sustained and integrated funding of training activities is also critical.

Partial implementation of a comprehensive IDSR process could lead to poor disease surveillance performance. The evaluation in Lesotho has shown that single day-long training sessions are inadequate exposure to integrated disease surveillance and the lack of simplified IDSR surveillance forms negatively impacts the performance of the surveillance(7). Other experiences documented in Tanzania after three years of implementation of a pilot project on IDSR in 12 districts revealed poor results in the performance of IDSR. The target of 80% completeness and timeliness of reporting and data analysis of priority diseases was not met at health facility and district levels(9). Partial implementation of recommended IDSR process and a limited commitment of health personnel to the changes are possible reasons for poor performance.

## Conclusions

Training district and health facility personnel was associated with improved performance of the national IDSR, especially in timeliness, completeness in reporting and analysis of data at the district and health facility level. This retrospective review suggests that training of district personnel coupled with a sustained supervision and feedback, reliable communication and availability of simplified reporting tools can contribute to improved performance of national disease surveillance and response systems.

## Competing Interests

The authors declare that they have no competing interests.

## Authors' contributions

I.S. conceived, carried out the review, data analysis and drafted the manuscript. P.G. carried out the review and participated in the data analysis. W.A., M.N., S.D. and H.P. each participated in the review and the preparation of the manuscript. All reviewed and approved the final manuscript.

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