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## **PRIORITY INTERVENTIONS FOR STRENGTHENING NATIONAL HEALTH INFORMATION SYSTEMS**

### **Report of the Regional Director**

#### **EXECUTIVE SUMMARY**

1. The strengthening of national health information systems (NHISs) constitutes a challenge for all countries and stakeholders to provide evidence in policy development and decision-making at all levels of national health systems and to track progress towards achieving the millennium development goals.
2. Health information systems have faced many serious constraints, including lack of written health information policy, scanty and unevenly distributed resources, fragmentation and lack of standards. Furthermore, data are passed on to the national level without being analysed or used, and most information systems tend to be “data-driven” instead of “action-driven”.
3. Some priority interventions to strengthen NHISs include elaboration of clear policy; setting up and strengthening management structures at all levels; strengthening staff capability and performance; integration; strengthening the use of information technology; self-assessment; using information for action; and operationalizing NHISs.
4. Governments should play strong stewardship roles in adopting health information system policies and strategies that guarantee generation and use of data for operations and strategic decision-making as well as allocate more resources for information systems.
5. The Regional Committee is invited to review and adopt these orientations for strengthening national health information systems.



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## INTRODUCTION

1. A health information system (HIS) is defined as a set of interrelated components and procedures organized with the objective of generating health information and intelligence to monitor the health status and health services of a nation to improve public health care leadership and management decisions at all levels.<sup>1</sup> Information systems are essential components of national health systems. Their primary purpose is to support informed strategic decision-making, support programme planning and management, monitor day-to-day performance and provide periodic evaluation towards agreed targets.<sup>2</sup> Thus, data have no value in themselves; value and relevance come when they are analysed, transformed into meaningful information and used.<sup>3</sup>

2. A national health information system (NHIS) is made up of several subsystems. These subsystems routinely report diseases and other medical conditions; support management; and register births, deaths and migratory movements. Where routine reporting is weak, it is supplemented by a special reporting subsystem for disease surveillance, programmes and surveys. The management subsystems deal with human resources, finances, essential medicines, public health supplies, transport and logistics, infrastructure and documentation.

3. The forty-third session of the Regional Committee (1993) reviewed the situation of national health information systems and adopted a strategy (AFR/RC43/17) for strengthening them. A plan of action to support the strengthening of NHISs<sup>4</sup> in Africa was subsequently developed. However, despite efforts in countries to make NHISs operational, they are still weak and unable to provide reliable, up-to-date and adequate information for action and decision-making.<sup>5</sup> This is partly due to the lack of consistency in the way policies and strategies are developed and implemented by countries, regional institutions and development partners.

4. This document proposes priority interventions that countries need in order to accelerate the strengthening of their NHISs. Full implementation of these interventions will enable countries to collect, analyse and quickly use data in daily and strategic management of their national health systems.

## SITUATION ANALYSIS

5. Implementation of health information systems in countries involves data collection, transmission, processing, analysis and reporting as well as decision-making (Figure 1). During the last decade, NHIS assessments revealed that despite limited resources, countries such as Eritrea, the Gambia, Niger and Tanzania have developed NHIS policies, national health indicators and integrated data collection forms.<sup>6</sup> Some countries have also developed

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<sup>1</sup> Lippeveld T, Sauerborn R, Bodart C (eds), Design and implementation of health information systems, Geneva, World Health Organization, 2000.

<sup>2</sup> Christopher J, Murray L, Evans DB (eds), Health systems performance assessment: Debates, methods and empiricism, Geneva, World Health Organization, 2003.

<sup>3</sup> Health Metrics Network, Geneva, World Health Organization, Evidence and Information for Policy, 2003.

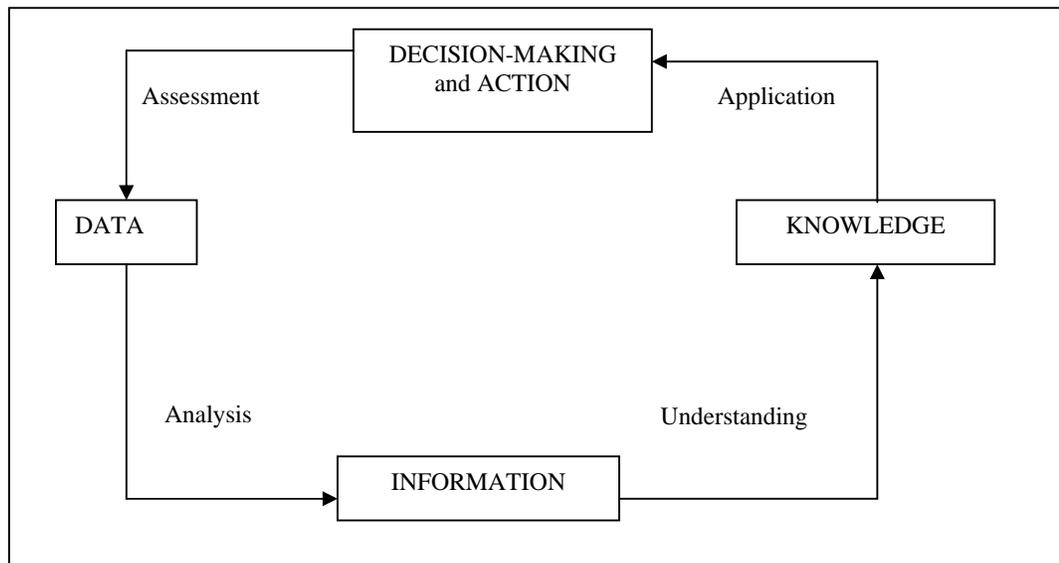
<sup>4</sup> WHO, Strengthening health information systems in Africa: A strategy and plan of action for the WHO African Region, Brazzaville, World Health Organization, Regional Office for Africa, 1995.

<sup>5</sup> WHO, Development of a management health information system in the WHO African Region, Brazzaville, World Health Organization, Regional Office for Africa, 2002.

<sup>6</sup> WHO, The world health report 2003: Shaping the future, Geneva, World Health Organization, 2003, p. 7.

and maintained user-friendly databases that are models of efficient health data collection from the primary care level to Ministry of Health level.

**Figure 1: The data-for-action cycle**



Source: Modified from Health Metrics Network, World Health Organization, Evidence and Information for Policy, Geneva, 2003.

6. Despite these achievements, the following weaknesses prevail: inadequate policies, poorly organized structures, lack of necessary resources at all levels, incomplete data, late processing and transmittal, lack of decentralized utilization of data for decision-making at all levels and insufficient use of available information. Management and vital registration subsystems are poorly developed in most countries, and yet data derived from the vital registration subsystem constitute a common denominator for infant and maternal mortality rates.

7. The shortage of human resources has been recognized as a limiting factor in strengthening NHISs. Public health expertise and leadership for NHISs is lacking in most countries. The capacity to develop and use health indicators to monitor and evaluate health development and impact still requires substantial improvement. Additionally, the available support staff do not have the requisite training to develop, administer and use national health information system databases. Generally, most of these staff do not have clear career profiles or recognized status in ministries of health.

8. Countries use patient medical record management systems for effective clinical management, epidemiological study of disease progression and monitoring of interventions. They also use, though with some difficulty, the International Statistical Classification of Diseases and related Health Problems and similar tools to standardize reporting on morbidity and mortality data. In order to address information gaps on causes of illness and death, assess

population health and collect views on performance of health systems, World Health Surveys have been undertaken in 18 countries in the African Region.<sup>7</sup>

9. Evaluation of epidemiological surveillance subsystems was conducted in the framework of implementation of regional integrated disease surveillance and response (IDSR).<sup>8</sup> In 2001–2002, national surveillance systems in 36 countries were assessed, and 89% of the countries had formulated national five-year plans of action for IDSR.<sup>9</sup> However, these plans are yet to be fully integrated in NHIS development plans ensuring better coordination of the management of the subsystems.

10. Some countries are currently in conflict or facing post-conflict conditions. There is growing impetus to generate information for evidence-based decision-making in these countries. Many of these countries suffer from almost total lack of current health information. Despite the recognized need for data, generating credible information in such settings is not an easy task.

11. Some countries use information technology (IT) to collect, process and disseminate health information. IT improves disease surveillance and health status reporting. Common problems in the efficient use of IT are lack of hardware, poor system maintenance, lack of sustainable energy source and shortage of adequately trained personnel.

12. Some countries are using Geographical Information Systems (GIS).<sup>10</sup> These constitute helpful tools for database development and mapping of spatial distribution of diseases and coverage of health services. NHISs need to improve the utilization of GIS in order to enhance assessment, monitoring, analysis and action by decision-makers at all levels of the health system.

## CHALLENGES

13. In implementing a functional national health information system, countries are faced with the following major challenges:

- (a) Investing in information systems in spite of the meagre resources available;
- (b) Sustainability of NHISs, including in emergency situations;
- (c) Ensuring integration of the health information subsystems and maintaining linkages with other sources of information;
- (d) Providing adequate staffing and strengthening technical capacity;

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<sup>7</sup> Countries covered by the WHS in 2002–2003 are: Burkina Faso, Chad, Comoros, Republic of Congo, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Mauritania, Mauritius, Namibia, Senegal, South Africa, Swaziland, Zambia and Zimbabwe; see footnote 2.

<sup>8</sup> WHO, Integrated Disease Surveillance in Africa: Regional strategy for communicable diseases 1999–2003, Resolution AFR/RC48/R2, World Health Organization, Regional Office for Africa, Brazzaville, 1998.

<sup>9</sup> WHO, The work of WHO in the African Region 2002: Annual report of the Regional Director, Brazzaville, World Health Organization, Regional Office for Africa, 2003.

<sup>10</sup> GIS allow the computerized treatment of geographically defined data, their entry, storage, analysis and presentation. A computerized health information system database which is linked to a digitized map can serve as a powerful evidence-based tool.

- (e) Developing cultures that regularly use available information for both operations and strategic management.

## **OPPORTUNITIES**

14. There is growing momentum and renewed interest in strengthening national health information systems for monitoring health status, programmes and systems in order to produce evidence and information for action. Well-established reporting systems of programmes for tuberculosis, polio eradication and integrated disease surveillance and response are opportunities for strengthening NHISs. Current efforts to provide data on risk factors for noncommunicable diseases (NCD) and to integrate their surveillance with IDSR will enhance NHISs. Given the number of countries in persistent difficulties, there are increasing calls for the development of tools and mechanisms for data collection and use.

15. Governments and international partners now realize that health is an integral part of national socioeconomic development. Priority is being put on performance of health systems, tracking progress towards the achievement of the millennium development goals and strengthening national health systems through The 3 by 5 Initiative. It is recognized that information and intelligence are required to achieve these goals.

## **OBJECTIVES**

16. The general objective is to accelerate the strengthening of national health information systems in countries in the African Region. Specific objectives are to:

- (a) set-up appropriate institutional and managerial structures at all levels in support of the national health information system
- (b) improve staffing, their technical capacity and performance
- (c) strengthen the use of available information technology
- (d) integrate various health information subsystems and strengthen the linkages between ministries of health and other ministries generating health-related information
- (e) operationalize NHIS and use information for both operations and strategic management.

## **GUIDING PRINCIPLES**

17. The following guiding principles are proposed for strengthening national health information systems:

- (a) *Accuracy*: Data should be accurate and standardized for comparative purposes.
- (b) *Timeliness*: Health data should be produced, submitted, processed and used within a reasonable time.

- (c) *Comprehensiveness*: Essential health indicators should include key aspects of the health system.
- (d) *Representativeness*: Statistics reported should be representative of the situation in individual countries and should be as complete as possible.
- (e) *Relevance*: Information collected should reflect the needs of the country.
- (f) *Complementarity*: Information collected through different subsystems should complement one another.
- (g) *Ownership*: Ownership should be fostered among all potential users of the information.

## **PRIORITY INTERVENTIONS**

18. The following proposed priority interventions should be adapted to address country-specific realities. The process begins with an in-depth assessment of the national health information system to identify strengths and weaknesses.

### **Elaboration of clear policy**

19. NHIS, as an integral part of the national health system and the development of health policy, should involve all stakeholders, including representatives from different levels of the Ministry of Health, other relevant ministries, development partners and private sector health agencies. The policy should state the objectives of the NHIS, implementation and maintenance responsibilities of various stakeholders, management structures and the necessary resources required at all levels of the health system. The policy must be supported by an NHIS strategic plan and compendium of definitions and indicators. Appropriate legislation and regulations will ensure compliance and enforcement. Advocacy will be required for national adoption of the policy.

### **Setting-up and strengthening management structures**

20. A national health information system should be made up of several subsystems. These should report diseases and other medical conditions, management information and vital registration statistics; these subsystems can be supplemented by epidemiological surveillance, as well as special reporting on programmes, systems and surveys. Each subsystem should undertake specific actions, including data collection, processing, analysis, presentation, interpretation, utilization and feedback, to make the system work. All of this requires leadership, sensitization, management support, resources and a set of organizational rules.

21. Most health systems in the African Region operate on three levels: primary, secondary and tertiary. Each level has different functions for management, health services provision and resource mobilization. The NHIS, therefore, should be responsive to the specific needs at each level.

22. It is necessary to define information needs at each level. This should be followed by the development or restructuring of data collection methods and instruments, data transmission and processing procedures, and appropriate feedback mechanisms. The routine HIS should support the three types of health management functions for patients or clients, units and programmes or systems across the various levels.

23. Design and implementation of the HIS should be driven not only by perceived needs for routine information but also by availability of resources. All levels require competent staff in sufficient numbers. Whether NHIS activities are performed by health-care providers or dedicated full-time staff depends on budget scenarios, service characteristics and country specificities.

24. Countries should set up national coordination committees to deal with planning, assessment, regulation of information technology and data management, implementation, monitoring and evaluation of the NHIS strengthening process.

### **Strengthening staff capability and performance**

25. Based on technical, organizational and managerial complexities, a multidisciplinary team at central level needs to be set up and given the responsibility to manage the health information system. This team should be competent in public health planning, management, statistics, epidemiology, informatics and training. Other than general system management, the team has a responsibility to strengthen staff capacity and performance in order to improve the quality of information and ensure the communication of information to decision-makers at all levels of the national health system. Therefore, intensive in-service training and regular supervision should be undertaken.

26. In each district, there is need to strengthen management teams with competencies in statistics, epidemiology, public health and computing. The higher levels of the system should identify capacity building requirements for lower levels and provide the necessary support and supervision to ensure the quality of data collected from the grassroots.

### **Integration**

27. Implementation of a national health information system should be within the context of health sector reforms and in the general framework of national socioeconomic development, recognizing, for example, that in some countries registration of vital statistics is managed by other government departments. The NHIS should be linked to the central statistical system which provides information for national development planning. Countries should ensure that all the components of the national health information subsystems are integrated in a systematic manner at central, regional, provincial and district levels. Health information from the private sector should be included. Community health information subsystems should be re-established; reliable maps of districts, health facility catchment areas and communities should be prepared and used.

28. Mechanisms for information sharing at district level between routine health statistics systems and other non-routine (community) data collection systems need to be established and clearly defined. In collaboration with other sectors, the NHIS should routinely provide information that contributes to early warning systems for health emergencies, facilitate health needs assessments during emergencies and provide appropriate information to the public for emergency action.

### **Strengthening the use of information technology**

29. Computer technology can greatly enhance and expedite data processing, storage and retrieval. It greatly reduces the time required for processing data at the district, regional and national levels, as well as the number of errors, provided there is accuracy in data entry. Countries are encouraged to sustain regular sources of electricity and emphasize computer networking of health units to enhance communication and reporting.

30. Countries that have the resources to computerize should be prepared to process data manually as well. Hardware maintenance should take into account the local capacity to bear the recurrent costs of such a network. If the health information system is totally reliant on computer technology, data processing is likely to fail in case of hardware breakdown. Therefore, manual data processing should also be included in training courses.

31. Countries should link the already existing computerized health information system database to a digitized map of their health infrastructure and communities in order to better target health interventions. To enhance the use of geographical information systems, it is necessary for NHIS teams to collaborate and exchange information with other arms of government such as ministries of lands, agriculture and local government.

### **Self-assessment of performance**

32. Ministries of health should periodically conduct internal assessment of the NHIS, checking on such issues as soundness and relevance of indicators, timeliness in reporting and utilization of data for decision-making at central, regional, provincial and district levels. Managers should compare actual activities with plans and targets; findings should generate appropriate adjustments.

### **Using information for action**

33. In order to ensure collection and use of health information and the strengthening of NHISs, national authorities should encourage decision-making based on data. Information should provide the answers to planning questions. Having information does not mean that managers will use it. At all levels of the health system, evidence should guide decisions, actions and changes. Managers need to receive up-to-date and accurate information and provide timely feedback.

34. Health programmes and personnel need to generate knowledge for action in addition to collecting data. Health personnel should be encouraged to produce and use annual health statistical reports and update country health system profiles.

### **Operationalizing national health information systems**

35. Once the NHIS policies and structures are in place, countries should identify relevant indicators at all levels of the health system. They should also define the minimum datasets; develop, print and distribute forms and other data collection tools; assign responsibilities at all levels; and agree on the regularity of reporting. Coordination at all levels and feedback among all stakeholders will stimulate collection and utilization of data, thereby operationalizing NHISs.

### **ROLES AND RESPONSIBILITIES**

36. Countries should strengthen or establish NHIS coordination committees, adopt a policy that is part of the national health policy, review and update essential indicators, develop NHIS strategic plans, and ensure effective use of evidence for policy dialogue, decision-making and action. They should strengthen or establish NHIS units and increase investment, especially for NHIS capacity building. Countries should enhance the use of information technology and strengthen computer networking in ministries of health. Web pages for health data publishing should be set up.

37. The World Health Organization and partners such as NGOs and bilateral and multilateral agencies should strengthen and support health information systems by providing guidelines, tools and standards to countries; they should facilitate the establishment of mechanisms to promote networking of NHISs. The World Health Organization and other partners will emphasize the promotion of technological solutions that facilitate networking, communication, access and use of health information. They will also support countries in resource mobilization and capacity building for NHIS.

### **MONITORING AND EVALUATION**

38. Monitoring of progress in the implementation of the priority interventions to strengthen NHISs should be systematically carried out and regular updates given to the Regional Committee. Guidelines for the assessment of progress should be established at regional level, while countries will set their own targets based on specific situations.

39. Information derived from NHIS should be used at country and regional levels to monitor, evaluate and strengthen operations and strategic management.

### **CONCLUSION**

40. Countries have been attempting to generate evidence through national health information systems for health policy dialogue and decision-making. Despite these efforts, the information has remained weak; strengthening systems remains a challenge which should be tackled within the context of health sector reforms. The proposed priority interventions could substantially help countries to accelerate the implementation of the regional strategy to strengthen NHISs.

41. Policy-making and decision-making that are based on evidence will inevitably enhance and ensure sustainable national health information systems. These processes require strong stewardship by national authorities and commitment by partners.

42. The Regional Committee is invited to review and adopt the orientations contained in this document, “Priority interventions for strengthening national health information systems”.