

**Report on Strengthening National Health Information
Systems: Workshop on the use of Geographical
Information System HealthMap**

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1. Background

National health information systems (NHIS) were always considered as the weak link in health systems. Their strengthening poses a challenge which needs to be addressed by the countries of the African Region within the framework of the evaluation of the performance of health systems¹. The WHO Regional Committee for Africa, at its fiftieth session, and by its resolution AFR/RC50/R1 adopted the Health-for-All policy with regional targets to be achieved by 2020² in order to address health problems facing the countries of the African Region. To be capable of monitoring and evaluating these targets correctly, countries have inevitably to strengthen their NHIS and, at peripheral levels, provide their health systems with adequate and simple tools allowing them to analyze data collected and take decisions.

WHO/AFRO, in pursuing its mandate of providing technical leadership and support in the health sector to Member States, developed the main orientations and a strategy to strengthen NHIS³ which countries used in the context of the health sector reform. Furthermore, WHO/AFRO intends to use the Geographical Information System (GIS) to help improve the process of decision-making by producing health maps based on essential health indicators. To that end, WHO, in collaboration with UNICEF, developed a health information management and mapping tool by developing the HealthMap⁴ software based on GIS and integration of databases. Since its introduction, HealthMap has played a fundamental role in the analysis of the accessibility and availability of health services. A priority in the process of strengthening NHIS is to enable the countries to have such software and to produce maps for the management and follow-up of activities.

The workshop on strengthening national health information systems (NHIS) was held in Harare, Zimbabwe from 1 to 4 July 2002. Participants came from the following countries of the Southern Africa epidemiological block: Angola, Comoros, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Zambia and Zimbabwe (The list of participants is attached as Annex 1).

2. Opening Session

Dr R. Chatora, Director, Division of Health Systems and Services Development, WHO/AFRO, Brazzaville, officially opened the workshop and made some important remarks the highlights of which are as follows:

- (a) health systems in the African Region are weak and the data used are not up to date and therefore do not truly reflect the situation in the countries;
- (b) information in general is not always readily available in most countries, and where it is available, it is not always complete, comprehensive or updated;

¹The World Health Report 2000: Health Systems: Improving Performance. WHO, 2000

²Health-for-all Policy for the 21st Century in the African Region: Agenda 2020. WHO/AFRO, 2000, AFR/RC50/8 Rev.1.

³Strengthening Health Information Systems in Africa: A strategy and plan of action of the WHO African Region, March 1995, WHO, Regional Office for Africa, Brazzaville.

⁴HealthMap, CDS/WHO, Geneva, <http://www.who.int/emc/healthmap/healthmap.html>.

- (c) sometimes decisions are made without evidence and, as a result, they have no impact on health status;
- (d) countries in the regions are at different stages of development in this area ranging from the existence of hardly any information systems to fairly functional information systems.

He reminded the participants that the workshop was aimed at learning from one other in order to identify the strengths, weaknesses, opportunities and threats in the countries and as well as strategies for the establishment of an adequate mechanism for harmonization and unification of data collection, analysis and feedback. He went on to say that the main challenges at country level remained the strengthening of vital registration systems, the analysis of information on the utilization of health services, how to ensure adequate use of epidemiological surveillance data and appropriate surveys and how to generate evidence to support policy debate and decision-making. He encouraged the countries to implement some of the lessons learnt from the workshop by reorganizing and using existing resources even if additional resources were not available.

After the opening session, office bearers were elected and the workshop programme was adopted. Thereafter, the Regional Adviser for Health Information Systems (HIS), Dr Soumbey-Alley presented the general and specific objectives and the expected results of the workshop. The method of work of the workshop were: (a) plenary sessions (presentation of country reports, divisional report and group report); (b) group work on specific themes; and (c) demonstration and practical utilization of software. The first two days were devoted to formal presentations on HIS and documentation of country experiences. The last two days were for briefing sessions on the GIS HealthMap and the data management tool, EPI/INFO 2000.

3. Objectives of the Workshop

The General objective of the workshop was to contribute to the strengthening of national health information systems in countries in the African Region. The specific objectives were:

- (a) to document experiences accumulated since the implementation of the 1995–1999 regional strategy on the strengthening of HIS.
- (b) to update participants on priority interventions needed for an effective and successful HIS.
- (c) to provide inputs for the implementation of the Management Information Systems developed by WHO/AFRO.
- (d) to brief participants on the use of geographical information systems such as HealthMap and data management tools software such as EPI/INFO 2000.

4. Strengthening National Health Information Systems

In all, six countries (Namibia, Seychelles, South Africa, Swaziland, Zambia and Zimbabwe) gave presentations (see Annex 4) on the situation regarding the strengthening of their respective national health information systems.

4.1 Overview of the situation and prospects for the future

The framework for Health Information Systems (HIS) was defined as follows: “HIS operational boundaries including all resources, organizations and actors that are involved in the generation and management of information necessary for improving the effectiveness and efficiency of health services through better management at all levels of health services”. This framework showed the functions and goal of HIS.

The meeting then made an inventory of all the resources needed to ensure the efficiency of HIS processing function, management, capacity building, planning, monitoring and evaluation and went on to make a situation analysis of NHIS in the Region. Ninety per cent of countries in the African Region had implemented the regional strategy on the strengthening of NHIS. Country experiences showed that: (a) more information was available but not necessarily used; (b) district-level data were not accurate enough and data flow from districts to national level was limited; (c) links between health information systems and other sources of health information such as household surveys were inadequate; (d) analysis, reporting and feedback are not timely; (e) information for action and decision making were poorly used; (f) information and data on inputs (financial, supplies, technical support) were scarce; (g) Outcome data (knowledge, attitudes, behaviours) were not regularly collected; (h) Impact data (morbidity and mortality) were available from disease prevalence data; (i) most indicators were relevant but were too many.

Countries needed to use the opportunity of the global Health System Performance Assessment to strengthen their HIS. They needed also to set their priorities in order setting to strengthen their HIS as follows:

- (a) Definition of HIS national policy and development plan.
- (b) Establishment of a structure for the management of NHIS unit and provision of the necessary resources.
- (c) Development of partnership mechanisms through strong advocacy and use of evidence in decision-making (UN agencies including WHO and UNICEF, bilateral cooperation, regional observatories).
- (d) Implementation of follow-up mechanisms to strengthen information flow and give motivation (supervision, trainings).
- (e) Establishment of a unified HIS and Integrated Database.
- (f) Development of a comprehensive, consistent, clear, simple, cost-effective, accessible and confidential HIS.

4.2 Country experience in the implementation of the regional strategy for the strengthening of NHIS, 1995–1999

Two countries (Swaziland and Namibia) presented their national experiences in the implementation of the regional strategy.

4.2.1 Swaziland

Mrs Mthethwa, Health Systems Expert, WHO Country Office, Swaziland presented the NHIS of Swaziland. Despite the implementation of the regional strategy since 1996, the HIS in Swaziland faced the following challenges:

- (a) high staff turnover;
- (b) inadequate forms and malfunction of computer package used for data capture;
- (c) weak HIS management capacity of staff at all levels;
- (d) lack of an Epidemiologist/Senior Statistician for the development of a unified HIS;
- (e) ensuring timely reporting, feedback information and adequate data analysis;
- (f) Poor use of information for decision-making.

4.2.2 Namibia

Mrs Matroos, HIS Officer, Namibia, presented the NHIS of that country. The NHIS underwent a major revision in 1994, with the newly designed forms, procedures and computerized system on 1 January 1995. After five years of use, the system was revised again in 2000 and was completely decentralized and computerized to improve independent use of data at all levels especially in districts and health facilities which are the anchor and source of health information for decision-making and action. The Namibian HIS had adapted a simplified ICD 10 that was commonly used worldwide. All codes were in three digits, which efficiently allowed specific coding for HIS purposes. The introduction of the codes facilitated and improved the accuracy of analysis of inpatient data.

An instruction and reference manual was developed and now provided comprehensive and detailed instructions and reference material regarding the correct completion of the HIS tally sheets and monthly reporting forms. Sections of the forms were in pictures to make it easier for users to find the place in the manual where that section of the form was covered. HIS training workshops were being conducted annually to strengthen the capacity at national, regional and district levels to generate, analyse and utilize HIS data for management and planning. To help encourage staff at health facilities to use some of the data that they gathered and reported to the HIS each month, the FHIS (Facility Health Information System) and the CHIPS (Chart of Indicators and Progress) were introduced. CHIPS is a chart or graph format, supplied in a pad to each facility that staff could use for keeping regular track of progress or chart indicators that they selected to monitor.

4.3 Identification of issues related to NHIS and proposal of priority interventions

The participants were divided into two groups to discuss issues related to NHIS and propose priority interventions for strengthening the existing health information systems in order to achieve appropriate and effective national health information systems.

Issues arising from the group discussions were as follows:

- (a) there was need for a clear multisectoral policy in information gathering at community level in terms of who, when and how. Such a policy should encourage the use of existing community cadres like TBAs, community health workers, traditional leaders etc.. The health workers should respond to and support the policy in various ways, such as providing broad but clear case definitions for community data collectors, and providing appropriate and timely response and feedback to the community;
- (b) use of rural participatory methods in health planning (get community priorities right!) should be promoted as it was expected to provide an incentive for community involvement in data collection;
- (c) HIS implementation should be done within the context of health sector reform and in the general framework of national social and economic development. Thus it was necessary to put in place mechanisms for information sharing between different sectors and partners, including communities. For example, health facilities should provide feedback to the communities, and carry out outreach clinics, home visits, etc.;
- (d) although qualitative data may not be collected on routine basis, periodic qualitative data could be collected as needed. Such need may be created by results from the routine quantitative data;
- (e) patient/client data recording could be improved by promoting the use of information at the point of collection; keeping data collection tools simple and short (KISS); regularly updating both the data collection forms and the data collectors; and putting HIS in the basic training modules of health workers in order to influence good practice followed by continued on-the job training;
- (f) mechanisms for information sharing between routine health statistics with other non-routine data collection systems needed to be established, using the institutions and organizations that coordinated the collection of these data;
- (g) capacity needed to be built at each defined level in order to provide appropriate and timely feedback to lower levels, and utilize the information for action at each level. Appropriate relevant guidelines and training tools needed to be developed. In addition, capacity could be enhanced through monitoring and support supervision;
- (h) in order to facilitate decision-making, information should be presented in a simple, packaged and user-friendly manner so that it could be easily conceptualized. Evidence generated from such information could be used for advocacy;
- (i) although computerization in the health sector would yield dividends, it should be accompanied with a strong component of continuing training in both software and hardware management.

4.4 Development of the Management Information Systems in WHO/AFRO

Dr Abdou, Regional Adviser for Health Situation Analysis (HSA), gave the presentation on the topic. He spelled out the objective of the Regional Framework of the Management Information System which was to strengthen the capacity of AFRO and its Member States to produce, analyze, utilize and disseminate information that could be used to assess the health situation and trends. He also outlined the specific objectives, the components of the information system, priority actions on the organization of an integrated regional database which is urgently needed and a common list of indicators. As a result, evidence would be generated in the form of yearly publication of pamphlets on selected indicators: AFRO Public Health Journal; Regional Health Situation Report; Towards Health for All in the 21st Century. Response would also be provided to ad hoc requests. In his conclusion, he outlined the steps to the implementation of Management Information System at country level.

Questions were raised on what WHO could offer in terms of training in ICD10. The Regional Office responded by stating that training could be offered when the country focal point for classification was identified and an assessment of the situation was done in order to come up with a training plan. On the use of Internet access in country offices, WHO informed participants that it could assist in developing websites if needed.

4.5 Strengthening HIS at operational level

Dr Tumusiime, Regional Adviser for District Health Systems (DHS), presented a general overview of lessons learned from past experiences of data collection and handling and outlined major principles for strengthening HIS at operational level. These principles included the need to:

- (a) Generate and handle necessary data.
- (b) Keep the system as simple as possible.
- (c) Use data for decision making at local level.
- (d) Send other data for decision and policy-making at higher levels.
- (e) Provide timely feedback.
- (f) Provide adequate supervision and technical support to lower levels.

In addition, he highlighted the need for developing proper linkages between different data sources and gave examples of community type of data. It was emphasized that higher levels were expected to identify capacity requirements for lower levels in data management and provide necessary support and supervision.

During the discussion it was emphasized that mechanisms should be put in place to guide the sharing of information with the media. There should be a clearance mechanism to avoid unnecessary transmission of data or information. He said the frequency of data analysis was very important and may be quarterly, monthly, weekly or annually, depending on the nature of data.

A question on the creation of generic guidelines for the collection of data at community level was raised and the WHO/AFRO team responded that it was just starting to work on that aspect which was

purely a new area. The participants felt that, much as data collection was important, it was equally important that an effective data storage mechanism be put in place.

4.6 Surveillance of non-communicable diseases

In his presentation, Dr Antonio Filipe Junior, Regional Adviser for non-communicable diseases listed the priority non-communicable diseases in Africa, which were cardiovascular diseases, diabetes, cancer, chronic obstructive pulmonary disease including asthma and sickle cell disease. He outlined the current situation of these diseases in Africa, the rationale for their surveillance and the main reasons for focusing on risk factors. A global surveillance strategy and framework for sharing and disseminating information (WHO STEPwise approach) was being mapped out. Seven countries (Algeria, Côte d'Ivoire, Senegal, Mozambique, Ghana, Nigeria and Zimbabwe) had been selected to implement this approach, while proposals for STEPS implementation were to be finalized and submitted for endorsement by the ministers of health.

4.7 Communicable epidemiological diseases surveillance

Dr Louis Ouedraogo, Regional Adviser for Epidemiological Surveillance and Data Management in DDC, started his presentation by defining epidemiological surveillance. He recalled that following the WHO Regional Committee resolution AFR/RC48/R2, passed in September 1998, a strategy was adopted to address the need to change from the current situation of vertical surveillance using the integrated approach. He listed the implications of effective Integrated Disease Surveillance (IDS); the expected results of IDS; and the requirements for ongoing support for IDS implementation.

During the ensuing discussions, questions were asked about the role of the data manager. It was explained that the role of data manager was crucial and that a plan of analysis should be developed either by the HIS Manager or an Epidemiologist. The great importance of communication was underscored. IDS reporting form came under discussion as some of the information collected did not influence decision-making, for example as regards chronic diseases like tuberculosis and HIV/AIDS. Efforts were needed to improve this area.

4.8 Selected reproductive health indicators in the African Region

Dr Kosia, Regional Adviser for Human Reproductive Health, presented the features of reproductive health problems in the region as well as a list of indicators for measuring the performance of reproductive health programmes. Indicators were important because they impacted upon the effectiveness of programmes and/or directed programmes to the introduction of interventions. They should be simple, inexpensive and easy to understand. It was essential to provide training in the collection of indicators and to establish appropriate databases.

Reproductive health indicators that were presented were going to be reviewed within AFRO in order to reach a consensus before they were field-tested. The inclusion of post-partum rate, domestic violence and sexual abuse rates in the list of indicators was considered as important as it would help member countries to reveal and document facts about hidden social problems.

It was recommended that the private sector be made to participate in data collection and sharing since a significant proportion of services like caesarean section were provided by the private sector.

4.9 Specific environmental health indicators

Mr Hounkpatin, Sanitary Engineer in charge of data management in the Environmental Health and Sustainable Development Division outlined three issues concerning environmental health indicators: the role of environmental indicators; specific groups of environmental indicators; and the data to be entered into the regional data-base. This role resulted from the increasing need to monitor and assess the effects of policy interventions. Furthermore, a list of indicators was presented, covering areas like sanitation, water supply, air pollution, solid waste management, municipal waste collection, food safety, hazards and shelter.

Concerns were raised about the fact that the indicators were too broad and whether there were no other sets of indicators concerning environmental health. In his response, Mr Hounkpatin said that the selection of environmental indicators depended on country priorities, though it was important that a minimal set of data be collected. It was also felt that mapping of areas was vital to depict areas influenced by environmental changes.

4.10 Country experience in the collection of data and utilization of relevant indicators

4.10.1 Seychelles

In his presentation, Mr Didon, from Seychelles, gave an overview of demographic information and the health structure of Seychelles which is a small country where most of the health structures are in place. Epidemiological information on morbidity and mortality was presented, covering the period from 1960 to 2001. A good vital registration system was in place. Some of the weaknesses mentioned were: lack of proper guidelines; increasing turnover of doctors; practitioners' lack of knowledge on the use of ICD-10 codes; and absence of data from private institutions.

In Seychelles, health information reports were produced weekly, monthly, quarterly and annually. They were even discussed at cabinet level.

4.10.2 Zambia

Mr Chipalo Kaliki from Zambia gave a presentation on HMIS which was designed in the context of health reforms as a routine monitoring and evaluation tool. The system was decentralized, action-oriented, responsive and transparent. He noted that HMIS in Zambia reported unrealistically high programme coverage rates especially in the area of immunization. There were also inconsistencies in reporting of OPV, DPT1 and DPT2. Some of the other challenges were: inadequately trained human resources; delay in submission of reporting forms; inadequate and untimely distribution of stationery.

In conclusion, the Zambian HMIS was expected to:

- Intensify support supervision visits to districts and provinces.
- Harmonize different reporting systems in order to ensure reliability and validity of data to be disseminated.

In response to a question on the means of verification used or the tools used for feedback, Mr Kaliki said that, at each level, a checklist was used, and if there were any gaps, such reporting forms were sent back for corrections. A self-assessment tool was also in place through which health workers were setting a target that should be met within a certain period of time.

4.11 Collection and generation of data and calculation of health indicators

After the presentation given by Dr Abdou on health indicators, the participants reviewed the list of the Regional Core Indicators in (Annex 3), and discussed the following questions during the group work: (a) How best can countries implement the Regional Core Indicators?; (b) What are the resources needed?; (c) What are the existing and anticipated constraints?

The groups concluded that there was need for technical assistance to evaluate the indicators periodically. Furthermore, resource mobilization to support data collection (e.g. surveys and censuses) was required. The following relevant issues were underscored:

4.11.1 Implementation of the regional core indicators at country level

A linkage must be established between all the sectors in the country and the census board or bureau of statistics that produced this data. There was need for a central board of statistics coordination where all sectors were represented as was the case in Mozambique. National surveys must be carried out by the ministry of health with the knowledge of the bureau of statistics. A link must be established between the bureau of statistics that generates data and the ministry of health. In other countries like Zimbabwe, Swaziland and Lesotho, the statistics bureau had seconded staff to the Ministry of Health. The bureaus of statistics should be encouraged to widely disseminate data. WHO should provide guidelines on obtaining quality information.

4.11.2 Resources needed

- (a) Funds.
- (b) Skilled human resources.
- (c) Capacity building.
- (d) Communication facilities (telephone, faxes, e-mail, internet, messengers, vehicles etc).
- (e) Data collection equipment and methods.
- (f) Forums for dissemination of information.
- (g) Multi-sector data sources and methodology.

4.11.3 Constraints

Lack of co-ordination among bodies demanding indicators/data suited to their needs (UN, EU, SADC, AU etc).

Lack of funding.

Lack of indication as to how useful the collected data is.

Inadequate capacity for recording, collection and compilation of data at collection points.

Lack of motivation (poor salaries, lack of feedback), and skills for data entry and analysis.

Poor quality of data.

Poor coordination of surveys designed to produce indicators.
Cost of maintaining the infrastructure established for the purpose of data collection (IT, etc).
Lack of skilled personnel (HIV/AIDS impact, etc).
Political and economic instability.

4.12 Importance of geographical information system

Dr Soumbey-Alley explained the importance of GIS in the analysis of data at the different levels of the health systems especially for the mapping of the health situation and epidemiological risk profiles; the planning and programming of activities, and the monitoring and evaluation of interventions. He stressed the importance of GIS as a computerized system able to store, handle, analyze and visualize geo-referenced health information. He underscored the following GIS activities In the African Region:

- (a) Training of health personnel.
- (b) Development of cartographic and epidemiological databases.
- (c) Dissemination of epidemiological surveillance results.
- (d) Strengthening of collaboration between countries, WHO Programmes, Divisions and Regions, and agencies such as WHO and UNICEF.

4.13 Presentation of country experiences in the utilization of GIS

Two countries (Zimbabwe and South Africa) presented their national experiences in the utilization of GIS.

4.13.1 Zimbabwe

In her presentation, Mrs Dube, Surveillance Coordinator, NHIS, Ministry of Health and Child Welfare, Zimbabwe addressed the following areas:

Background

- (a) 1991: Maps were produced for use in strengthening disease surveillance.
- (b) 1995: Public Health Initiative was undertaken to develop GIS/Mapping System of Health Facilities.
- (c) 1998/99: GIS training was provided for PMD, PHIO and MPH students.
- (d) 1998: HealthMapper was first introduced by WHO to strengthen malaria surveillance.
- (e) 2002: GIS was introduced as a public health disease surveillance tool.

Progress: Expansion of GIS in May 2002 at national level:

- (a) Sensitization of staff to HealthMap;
- (b) Inventory of computers to determine their capacity;
- (c) Upgrading of computers with limited capacity;
- (d) Installation of software in all computers with adequate capacity in the Health Information and Surveillance Unit (HISU);
- (e) Mobilisation of resources to expand HealthMap at national level;

- (f) Requests for computers with adequate capacity;
- (g) Training of HISU staff;
- (h) Training of 2 DHE members in 10 RBM districts in health mapper and malaria data management;
- (i) Inventory of computers in the districts and provinces;
- (j) Strengthening of the Rapid Disease Surveillance System: malaria, diarrhoeal diseases e.g. cholera, dysentery, EPI target diseases, zoonotic conditions;
- (k) HIV sentinel surveillance ;
- (l) National health profiles.

Limitations:

- (a) Inadequate training of staff.
- (b) High staff turnover.
- (c) Inadequate computers with CD ROM and suitable RAM.
- (d) Continued limitation of the use of HealthMap to national level.
- (e) Non-inclusion of some clinics/primary care facilities due to latitudinal and longitudinal issues
- (f) Non-use of private sector data.

Way Forward:

- (a) Continue to train and support staff up to district level.
- (b) Train programme and data managers in the use of HealthMap.
- (c) Continue to mobilise resources.
- (d) Improve quality of data through validation and use at each level.
- (e) Districts to include missing health facilities.
- (f) Districts and provinces to produce reports with health maps (evidence of use).
- (g) Monitor and evaluate use of the system regularly and involve cities and private sector.

4.13.2 South Africa

The presentation by Mr Aphane, Spatial Database Manager, National Department of Health, South Africa, on the experience of South Africa in the use of GIS, focused on the following points:

Background

- a. NHIS/SA established by the minister of health in 1994.
- b. A public-private committee guided by five pillars was set up.

One of the main pillars of the strategy document is guided by the principles following:

Data to be collected at its generation :

- i. Data collection is to enable service assessment as well as self-assessment.
- ii. Service delivery personnel would have responsibility for data collection.
- iii. Basic analysis would be carried out at the point of collection.
- iv. Collection, aggregation and analysis would follow organisational structure of health services

- v. In April 1995 the committee developed ReHMIS.

Problems with ReHMIS :

- (i) Inability of ReHMIS to handle the great volume of data generated.
- (ii) Systems user interface not friendly.
- (iii) Specialised skills required for its operation, e.g SQL.
- (iv) Lack of an integrated HIS:
 - Major breakthrough – implemented strictly according to NHIS/SA principles.
 - Less impact as hospitals are still running their own systems (e.g Medicom, Oasis, Systech Meditech, Unicare, Paab and Pads).
 - Inroads still being made, though, as it has a GIS module for spatial data capturing.

Introduction of GIS

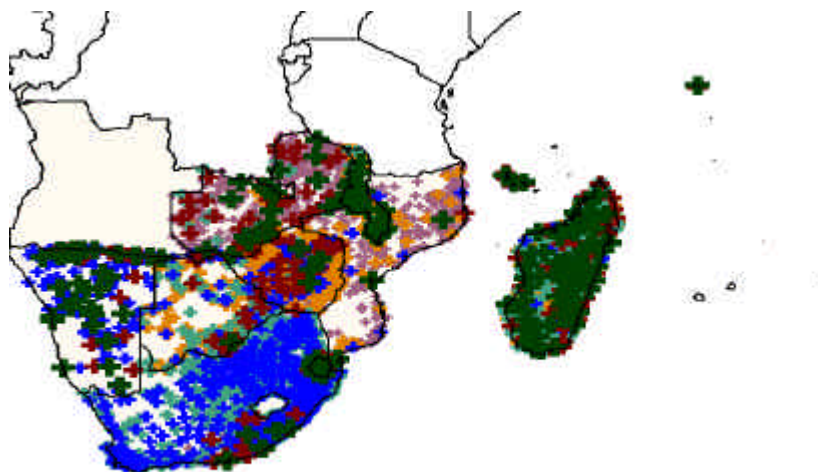
In South Africa, GIS was introduced at national level in order to facilitate the utilization of data from the different systems at national level and to provide a snapshot of the health status of the nation. It is now used as reporting tool but steps are underway to build a data warehouse (subject-oriented, integrated, time variant, non-volatile data repository that supports decision-making) capable of storing and analysing the spatial component of operational data.

4.13.3 Overview and orientation as regards the utilization of the HealthMapper and EPI/INFO 2000

The orientation sessions of the workshop started with a presentation on the HealthMapper (v.3) by Mr Bram Piot, Geographer and Data Manager of the HealthMap Programme in Geneva. Most important and most relevant functions for the use of the HealthMapper/Data Manager within NHIS were demonstrated. On the last day, after a final overview of the HealthMapper, E. Kufa, Data Manager in the DDC division of AFRO gave a demonstration and practical session on the use of EpiInfo 2000 for data entry.

Several countries showed interest in using the HealthMapper within the NHIS and were advised on how to request training or how to organize preliminary data collection. In order to map out relevant data, the location of health facilities and health districts were considered as essential when using GIS within a NHIS context. As several participants had brought along with them data on health infrastructure or had sent such data before the meeting, it was possible to include them in the HealthMapper database before the end of the meeting, and to provide more up-to-date CD's to each of the countries (every country received a copy of the HealthMapper application customized for the country). Lists of health facilities were collected for all the countries represented at the workshop, including even Madagascar which did not send a delegate to the workshop. (see figure 1).

Figure 1: Map of health facilities (located by the sign + in different colors) of the countries of the Southern Africa Epidemiological Bloc



5. Summary of Discussions

Within the framework of the development of the management information systems (MIS) in (WHO/AFRO), plans are underway to strengthen the capacity of AFRO and its Member States to produce, analyze, utilize, and disseminate information to improve action. The present workshop aimed to prepare the ground for the implementation of MIS and brief the NHIS focal points on the utilization of relevant software such as HealthMap and EPI INFO 2000. During the workshop organized for countries of the Southern Africa epidemiological bloc, the approach of integration of data from different sources was demonstrated by using HealthMap.

At the end of the workshop, the participants documented the strengths and weaknesses of the national HIS in monitoring and evaluation. Participants' knowledge of priority interventions for effective and successful HIS was updated. The workshop also provided useful inputs for the implementation of the Management Information Systems at the Regional Office. Two days were devoted to the orientation session on the Geographical Information System (GIS) HealthMap and on the data management tool, EPI/INFO 2000.

6. Conclusions and Recommendations

The workshop provided an opportunity for participants to share experiences in order to identify the strengths, weakness, opportunities, and threats in the countries and the solutions envisaged for the establishment of an adequate mechanism of harmonization of data collection, analysis and feedback. The findings of the workshop will be pursued at all levels of the health structure of the countries in the African Region, with a coordination effort which will take into account the various subsystems of the health information systems (integrated disease surveillance; routine reporting of health services; special programme reporting and health research; administrative systems including health care financing, personnel, drugs and logistics; financial management,

training programmes and health documentation management; and the vital statistics recording systems for births, deaths and migratory movements).

The workshop recommended:

To Member States:

- (a) To develop or update their policy document on national health information systems.
- (b) To develop an action plan based on the policy document which included the following:
 - (i) revision of their health indicators in light of the WHO/AFRO health core indicators
 - (ii) establishment of an adequate mechanism of harmonization of data collection, analysis and feedback tools at all levels;
 - (iii) development of an integrated national database.
- (c) To strengthen the capacity of NHIS personnel in the utilization of the GIS HealthMap and EPI/Info 2000 in collaboration with WHO.
- (d) To set up a mechanism to incorporate non-routine data and other data collection systems in NHIS.

To WHO:

- (a) to strengthen its normative functions by developing guidelines and other tools;
- (b) to mobilize resources and contribute to capacity building including ICD, HealthMap and EPI/Info 2000 training;
- (c) to provide support to countries for implementation of their NHIS activities;
- (d) to strengthen partnership with other agencies including NGOs;
- (e) to monitor and evaluate the NHIS.

7. Closure of the Workshop

During the closing session of the workshop, Dr Shiva, representing the WHO Country Office in Zimbabwe, emphasized the importance of this first meeting in the African Region since the publication of the World Health Report 2000. As team leader of the Southern Africa Epidemiological Bloc, he appreciated the active participation of the countries in this fledging process of strengthening of NHIS. He stressed the role of the countries in the strengthening of human resources and in capacity building in the management of data for evidence-based decision-making.

Dr Kosia, representing the WHO/AFRO secretariat, read out a vote of thanks to the WHO Representative Office, the DDC team in Harare and the participants from the countries. He commended the important role played by the facilitators and the active participation of the participants. He was followed by Mrs Mthethwa who delivered the final address by thanking the organizers of the workshop.

ANNEX 1

List of Participants

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Annex 1

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ANNEX 2

Programme of the Workshop

Day 1	Time	Item	Presenter(s)
1-Jul-02	9:00-9:30	Registration of participants	Diouf
	9:30-10:00	Opening ceremony	Dr Chatora, DSD
		Introduction of participants. Administrative announcements	Diouf
	10:00-10:30	Workshop objectives and expected results, HIS	Soumbey-Alley
	10:30-10:45	Tea break	
		Specific Objectives Nos. 1 and 2	Chairperson: Mrs R.K. Mthethwa (Swaziland), Rapporteur: Mr A. Sitò (Mozambique)
	10:45-11:15	NHIS: Situation review and perspective for the future. 15mn Presentation, 15mn Discussion.	Soumbey-Alley
	11:15-12:15	Country experiences in the implementation of the regional strategy for strengthening of NHIS: 1995-1999. Swaziland: 5mn Presentation, 15mn Discussion. Namibia: 15mn Presentation, 15mn Discussion.	Mthethwa, Swaziland Matroos, Namibia
	12:15- 12-30	Introduction to group work	Soumbey-Alley
	12:30-14:00	Lunch break	
	13:30-15:45	Group work: Identification of issues related to NHIS and proposition of priority interventions for effective and successful HIS. Groups 1 and 2	Facilitators : <u>Group 1:</u> Abdou, Filipe, Tumusiime, Hounkpatin. <u>Group 2:</u> Ouedraogo, Kosia, Soumbey-Alley
	15:45-16:00	Tea break	
	16:00-17:00	Plenary discussion on the findings of each group.	
17:00-18:00	Meeting of facilitators		

Annex 2

Day 2	Time	Item	Presenter(s)
2-Jul-02		Specific Objective No.3.	Chair: Mr M. J. Aphane (South Africa) Rapporteur: Mrs E. Matroos (Namibia)
	8:00-8:45	Development of management information systems in WHO/AFRO. 20mn Presentation, 25mn Discussion	Abdou
	8:45-9:20	Strengthening health information system at operational level. 15mn Presentation, 20mn Discussion	Tumusiime
	9:20-9:55	Surveillance of noncommunicable diseases 15mn Presentation, 20mn Discussion	Filipe
	9:55-10:30	Communicable epidemiological disease surveillance: ongoing support and strengthening data analysis and feedback. 15mn Presentation, 20mn Discussion.	Ouedraogo
	10:30-10:45	Tea break	
	10:45-11:20	Selected reproductive health indicators in the African Region: the issues. 15mn Presentation, 20mn Discussion.	Kosia
	11:20-11:55	Specific environmental health indicators. 15mn Presentation, 20mn Discussion.	Hounkpatin
	11:55-13:05	Country experiences in the collection of data and utilization of relevant indicators: Seychelles: 15mn Presentation, 20mn Discussion. Zambia: 15mn Presentation, 20mn Discussion	Didon, Seychelles Chipalo, Zambia
	13:05-14:30	Lunch break	
	14:30-14:45	Introduction to group work	Abdou
	14:45-17:00	Group work: How to collect and generate data for the calculation of indicators in the countries: Groups 1 and 2	Facilitators : <u>Group 1:</u> Abdou, Filipe, , Hounkpatin. <u>Group 2:</u> Tumusiime, Kosia, Soumbe- Alley
	16:15-16:30	Tea break	
	17:00-18:00	Plenary discussion of the findings of each group.	
	18:00-18:30	Meeting of Facilitators	

Annex 2

Day 3	Time	Item	Presenter(s)
		Specific Objective No.4	Chairperson 3.7.02 : Dr H.N.Raman (Mozambique) Chair 4.7.02: Dr T. Nyirenda (Malawi)
	8:00-8:30	Importance of Geographical Information System . 10mn Presentation, 20mn Discussion.	Soumbey-Alley
	8:30-9:00	The HealthMapper: An overview. 20mn Presentation, 10mn Discussion.	Piot
	9:00-9:30	Country experience in the utilization of GIS: Zimbabwe. 15mn Presentation, 15mn Discussion.	Dube, Zimbabwe
	9:30-10:00	Country experience in the utilization of GIS: South Africa. 15mn Presentation, 15mn Discussion.	South Africa
	10:00-11:00	Tea break, Installation of computers	
	11:00-12:30	Practical session on HealthMap: Creating a national level map. Creating buffers around health facilities. Creating a graduated colour map of number of cases of malaria.	Piot / Kufa
	12:30-13:30	Lunch break	
	13:30-5:45	Practical session on HealthMap: Creating a district level map. Graduated symbol map of number of Guinea Worm cases. Creating a village level map.	Piot / Kufa
	15:45-16:00	Tea break	
	16:00-18:00	Discussion, feedback and wrap-up on HealthMap.	Soumbey / Piot
	18:00-18:30	Meeting of Facilitators	

Annex 2

Day 4	Time	Item	Presenter(s)
4-Jul-02	8:00-9:00	Discussion, feedback and wrap-up on HealthMap.	Piot
	9:00-10:30	EPI/INFO 2000: An overview. Practical session on EPI/INFO 2000: making a data entry form. CHK files. Making a view for entering viral hemorrhagic fever line list data: data entry, data cleaning, analysis.	Kufa
	10:30-10:45	Tea break	
	10:45-11:15	Importance of EPI/INFO 2000 in data management: discussion, feedback and wrap-up on EPI/INFO 2000.	Ouedraogo/Kufa
	11:15-12:00	Practice on HealthMap and EPI Info 2000 Copy of CDs. Drafting of recommendations.	
	12:00-13:30	Lunch break	
	13:30-15:45	Recommendations.	Abdou
	15:45-16:00	Tea break: Copy of CDs	
	16:00	Official closing of the workshop	WR/Zimbabwe
5-Jul-02	9:00-12:00	Meeting of Facilitators	

ANNEX 3

Regional Core Indicators

How to collect and generate data for the calculation of indicators in the countries?

In general terms, health indicators represent summary measures that capture relevant information on different health attributes and dimensions, and the performance of the health system.

Some definitions of the term “Indicator”:

- ▶ Indicators are variables that help to measure changes, directly or indirectly (WHO, 1981).
- ▶ Indicators are “an indirect measure of an event or condition” (Wilson and Sapanuchart 1993)
- ▶ An indicator is “a statistic of direct normative interest which facilitates concise, comprehensive, and balanced judgments about conditions of majors of aspects of a society” (Department of Health, Education, and Welfare, 1969).
- ▶ “Indicators are variables that indicate or show a given situation and thus can be used to measure change” (Green, 1992).

Types of Indicators:

- ▶ Count indicators: simply measure the number of events without a denominator.
- ▶ Proportion indicators: numerator is contained in the denominator.
- ▶ Rate indicators: probability or risk of disease in a defined population over a specified period of time.
- ▶ Ratio indicators: numerator not included in the denominator.

Helpful questions in selecting indicators:

- ◆ What is the indicator supposed to measure (**validity**)?
- ◆ What will be the cost of measuring the data?
- ◆ What is the relative importance of the subject matter to be addressed and the decision to be made on the indicator (**relevance**)?
- ◆ Does the indicator actually capture changes that occur in the situation under study and nothing else (**specificity**)?
- ◆ Is the change shown by the indicator a true change in the situation under study (**sensitivity**)?

Helpful questions for operationalizing an indicator:

- ◆ Clarity/ease of understanding?
- ◆ What are the sources of data (numerator and denominator)?
- ◆ At what frequency should the numerator and the denominator be collected?
- ◆ At what frequency should the indicator be processed and analyzed?
- ◆ Who will actually make use of the indicator (determining the level of aggregation over time and space)?
- ◆ What is the target (objective) of the indicator that needs to be achieved?
- ◆ What is the threshold (the minimum or maximum value) of the indicator that should trigger action?
- ◆ What will be the nature of the action (decision) once the indicator reaches the threshold?

Annex 3

Regional Core Indicators

I. TRENDS IN SOCIOECONOMIC DEVELOPMENT

A. DEMOGRAPHIC TRENDS

- 101 Total Population.
- 102 Population of women aged 15-49 years as a % of total population.
- 103 Population of children aged 0-11 months.
- 104 Population of children aged 0-5 years.
- 105 Population of adolescents (10-19 years).
- 106 Population under 15 years as a % of total population.
- 107 Population aged 65 years and above as a % of total population –Males.
- 108 Population aged 65 years and above as a % of total population –Females.
- 109 Life expectancy at birth –Males.
- 110 Life expectancy at birth –Females.
- 111 Life expectancy at age 65 years –Males.
- 112 Life expectancy at age 65 years –Females.
- 113 Total fertility rate.
- 114 Annual population growth rate (%).
- 115 Percent urban population.
- 116 Crude birth rate (per 1000 population).
- 117 Crude death rate (per 1000 population).

B. SOCIOECONOMIC TRENDS

- 118 Gross domestic product (GNP) per capita (US\$).
- 119 GNP per capita (US\$) adjusted for purchasing power parity (PPP).
- 120 Annual growth rate of GNP (%).
- 121 Adult literacy rate –Males.
- 122 Adult literacy rate –Females.
- 123 Percent of population living in poverty –Males.
- 124 Percent of population living in poverty –Females.
- 125 Percent of poor in rural areas.
- 126 Human Development Index.
- 127 Rate of unemployment –Males.
- 128 Rate of unemployment –Females.
- 129 Urbanization rate (%).

C. FOOD SUPPLY AND NUTRITIONAL STATUS

- 130 Percentage of liveborns weighing less than 2500 grams.
- 131 Proportion of children under five years with weight for age less than minus two standard deviation from the WHO reference median – moderate and severe deficit –Males.
- 132 Proportion of children under five years with weight for age less than minus two standard deviation from the WHO reference median – moderate and severe deficit –Females.
- 133 Prevalence of overweight among adults (20 years and above) – Males.
- 134 Prevalence of overweight among adults (20- years and above) –Females.

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D. LIFESTYLE

- 135 Percentage of population aged 15 years and above who are regular smokers –Males.
- 136 Percentage of population aged 15 years and above who are regular smokers –Females.
- 137 Proportion of youths of 10-19 years of age who are regular smokers –Males.
- 138 Proportion of youths of 10-19 years of age who are regular smokers –Females.

II. HEALTH AND ENVIRONMENT

- 201 Percentage of population with safe drinking water available in the home or within reasonable distance in urban areas
- 202 Percentage of population with safe drinking water available in the home or within reasonable distance in rural areas.
- 203 Percentage of population with adequate excreta disposal facilities available in urban areas.
- 204 Percentage of population with adequate excreta disposal facilities available in rural areas.

III. HEALTH RESOURCES AND FINANCING

- 301 Number of physicians per 10 000 population.
- 302 Number of midwives per 10 000 population.
- 303 Number of pharmacists per 10 000 population.
- 304 Number of dentists per 10 000 population.
- 305 Number of nurses per 10 000 population.
- 306 Number of health care providers (including CWH) per 10,000 population.
- 307 Total national health expenditure as percentage of GNP.
- 308 Total government health expenditure as a percentage of total government expenditure.
- 309 Percentage of national health expenditure devoted to curative care.
- 310 Percentage of national health expenditure devoted to preventive care.
- 311 Percentage of national health expenditure devoted to tertiary institutions.
- 312 Percentage of national health expenditure devoted to provincial/regional level.
- 313 Percentage of national health expenditure devoted to local health care.
- 314 Total government health expenditure per capita (US\$).
- 315 Recurrent government health expenditure as percentage of total health expenditure.
- 316 Percentage of recurrent government health expenditure going to salaries.
- 317 Percentage of essential drugs available in a sample of remote facilities.
- 318 Amount of international aid received as % of total government health expenditure.

IV. HEALTH SERVICES

- 401 Percentage of pregnant women attended by trained personnel during pregnancy.
- 402 Percentage of deliveries attended by trained personnel.
- 403 Percentage of infants attended by trained personnel.
- 404 Percentage of women of childbearing age using family planning.
- 405 Percentage of eligible population (i.e. infants reaching their first birthday) that have been fully immunized according to national immunization policies.
- 406 Percentage of infants reaching their first birthday that have been fully immunized against diphtheria, tetanus and whooping cough.

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- 407 Percentage of infants reaching their first birthday that have been fully immunized against poliomyelitis.
- 408 Percentage of infants reaching their first birthday that have been fully immunized against measles.
- 409 Percentage of infants reaching their first birthday that have been fully immunized against tuberculosis.
- 410 Percentage of women that have been immunized with tetanus toxoid during pregnancy.
- 411 Percentage of the population that have been immunized with hepatitis B vaccine.
- 412 Percentage of infants reaching their first birthday that have been immunized with yellow fever vaccine.

V. TRENDS IN HEALTH STATUS

A. MORTALITY

- 501 Infant mortality rate.
- 502 Neonatal mortality rate.
- 503 Probability of dying before five years (per 1,000 live births) –Males.
- 504 Probability of dying before five years (per 1,000 live births) –Females.
- 505 Maternal mortality rate (per 100,000 live births).
- 506 Number of registered under-five deaths due to measles for the year specified.
- 507 Number of registered under-five deaths due to diarrhoeal diseases the year specified.
- 508 Registered under-five deaths from polio for the year specified.
- 509 Estimated under-five mortality due to acute respiratory infections.
- 510 Number of registered deaths due to tetanus neonatorum for the year specified.
- 511 Number of registered deaths from tuberculosis for the year specified –Males.
- 512 Number of registered deaths from tuberculosis for the year specified –Females.
- 513 Estimated death rate from malaria for the year specified.
- 514 Number of registered deaths from AIDS for the year specified –Males.
- 515 Number of registered deaths from AIDS for the year specified –Females.
- 516 Estimated death rates due to cardiovascular diseases –Males.
- 517 Estimated death rates due to cardiovascular diseases –Females.
- 518 Estimated death rates due to malignant neoplasms (all types) –Males.
- 519 Estimated death rates due to malignant neoplasms (all types) –Females.
- 520 Estimated death rates (female) due to malignant neoplasms of the uterus.
- 521 Estimated death rates (female) due to malignant neoplasms of the breast.
- 522 Estimated death rates due to traffic accidents –Males.
- 523 Estimated death rates due to traffic accidents –Females.
- 524 Estimated death rates due to work accidents –Males.
- 525 Estimated death rates due to work accidents –Females.

B. MORBIDITY AND RISK FACTORS

- 526 Percent of infants exclusively breast-fed through 120 days of age.
- 527 Average number of decayed, missing and filled teeth at age 12.
- 528 Number of confirmed cases of poliomyelitis registered during the year.
- 529 Number of measles cases registered during the year among children under 5 years.


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- 530 Reported cases of tetanus neonatorum registered during the year.
- 531 Number of cases of malaria registered during the year.
- 532 Number of cases of Guinea worm registered disease (dracunculiasis) registered during the year.
- 533 Number of cases of leprosy registered during the year.
- 534 Number of cases of tuberculosis registered during the year –Males.
- 535 Number of cases of tuberculosis registered during the year –Females.
- 536 Number of cases of AIDS registered during the year – Males.
- 537 Number of cases of AIDS registered during the year – Females.
- 538 Proportion of women of childbearing age (15-49 years) currently using any type of contraceptive method.
- 539 Adolescent fertility rate (under 20 years of age).
- 540 Incidence of malignant neoplasms of female breast.
- 541 Incidence of malignant neoplasms of the cervix uteri.
- 542 Prevalence of hypertension –Males.
- 543 Prevalence of hypertension –Females.
- 544 Number of cases of iodine deficiency disorders.
- 545 Goitre rate per 100 school-age children.
- 546 Number of cases of anaemia in pregnant women.
- 547 Number of cases of anaemia in children < five years.
- 548 Number of cases of vitamin A deficiency disorders.
- 549 Number of cases of blindness.

Annex 4 : 1. Country Presentations during Workshop


- Swaziland
- Namibia
- Zambia
- Seychelles
- Republic of South Africa
- Zimbabwe

2. Photo of Training session



**Strengthening of National Health
Information Systems: Workshop on the
Use of the GIS**

**1 – 4 July, 2002
Harare, Zimbabwe**



**Swaziland Experience in the
Implementation of the Regional
Strategy on the Strengthening of
NHIS, 1995- 1999**

Presented By:

Ms Khosi R. Mthethwa



Background:

- Rapid appraisal of the health information system: done in 1995
- Main findings of the exercise
 - **Implementation of the strategy to be guided by an explicit policy and strategy.**
 - **Restructuring of the planning and statistics unit at the MOHSW headquarters.**
 - **Redesigning the flow of data at all levels.**



Purpose/Objectives of the HIS:

To provide information needed by:

- All levels of health planners and managers for planning, programming, budgeting, monitoring, control, evaluation and coordination of health programmes.
- Health care personnel, health research workers and educators in support of their respective activities.
- National policy makers, socio-economic planners and the general public.



The Key Elements of HIS were

to:

- Choose the issues to be addressed for the selected HIS subsystem.
- Select essential indicators.
- Identify the type and source of data needed for the measurement of the indicators.
- Collect, analyze and interpret data.
- Prepare an action plan for implementation of recommendations.



Main planned activities

included:

- Workshop for review and selection of the essential information for health services monitoring and for the measurement of the national indicators.
- Capacity-building on applied epidemiology and management of health interventions, at regional level.
- Review of the role and function of the health information system at the different levels as a basis for an adequate allocation of human resources.



Opportunities:

- Data forms and computer software for data entry have been created.
- Essential health indicators selected in 1996
- Support by the Italian cooperation since 1997.
- Assessment of NHIS in 1998.
- Improvement of the outpatient disease surveillance data capture forms to include health indicators on communicable and non-communicable diseases, mental disorders and others.



Challenges:

- **High staff turnover.**
- **Inadequate forms and computer package used for data capture.**
- **Weak HIS management capacity of the staff involved at all levels.**
- **Lack of an Epidemiologist / Senior Statistician for the development of a unified HIS rather than better coordination between vertical programmes and regional HIS team.**
- **Timely reporting and feedback information are not made available due to lack of data analysis and feedback.**
- **Poor use of information for decision making.**



NAMIBIAN

NATIONAL HEALTH INFORMATION SYSTEM

Namibia is located in the south-western part of the African continent. It is bordered by Angola to the north, Zambia and Zimbabwe to the northeast, Botswana to the east, South Africa to the south and Atlantic Ocean to the west.

- Surface area: 824 295 km².
- Estimated population: 1.8 million people (1 826 854).
- Consists of 13 administrative regions and 34 health districts.



CURRENT STATUS OF NHIS

The MOHSS is collecting health information/data on selected health and other indicators from all government/mission health facilities, i.e.

- 34 government/mission hospitals,
- 38 health centers.
- 275 clinics.
- and a total of more than 200 outreach points.

The tools being used by the MOHSS to collect information on selected health indicators are daily tally sheets and monthly summary forms.



HIS RECORDING/REPORTING PROCEDURES

- Daily data is transferred to Monthly Summary Report forms which are submitted to District level where they are reviewed for accuracy, correction of errors and then entered into computers.
- Daily tally sheets and/or census forms are maintained for different service areas at every government/mission health facility.
- Information is forwarded by E-mail or Floppy diskettes to the Regions and then to the National level where they are again screened and the data uploaded into the computerized HIS processing system.



STRENGTHENING OF NHIS

REVISION OF NHIS

NHIS was first introduced in Namibia in 1992, shortly after independence.

- The system underwent a major revision in 1994, with the newly designed forms, procedures and computerized system starting to be used on 1 January 1995.
- After five years of use, the system was revised again - its features expanded - in 2000. HIS2K began operating on 1 January 2001.



DECENTRALIZATION & COMPUTERIZED SYSTEM

- 100% Decentralization.
- 100% computerized.

This has been done to improve independent use of data at all levels in particular the district and facility levels which are in fact the anchor and source of the health information for decision-making and action.



INTERNET AND E-MAIL CONNECTION

The 2001 HIS software upgrade included the capacity to transfer data via E-mail in locations that are equipped with suitable telephone lines (automatic exchange telephone system) to address the issue of timely submission of data to the next level of reporting.

Currently 10 (77%) regions and 30 (88%) districts are connected to Internet with functional E-mail.



INTRODUCTION OF ICD-10 FOR INPATIENT MORBIDITY AND MORTALITY DIAGNOSIS

HIS introduced diagnostic/cause of death coding for all hospital discharges in 2001.

The HIS has adapted a simplified subset of an internationally standard disease-coding list (ICD Revision 10 Tabular List) that are commonly used throughout the world. All codes are 3 in digits, which allows efficiency in specific coding for HIS purposes.

The introduction of the codes eases and improves the accuracy of analysis of inpatient data.



INTRODUCTION OF STANDARD REGISTERS

Standard registers (Outpatient Department, Inpatient, Antenatal Care and Immunization) have been introduced for use in health facilities throughout Namibia in order to assure a standard source of recorded data in every facility.

Much of the data that is recorded in the register is not routinely reported to the HIS, but it is valuable for case management and follow-up (Active Surveillance) and serve as a legal and permanent record.



FORMS INSTRUCTIONS AND REFERENCE MANUAL

A Forms Instructions and Reference Manual provides comprehensive and detailed instructions and reference material regarding the correct completion of the HIS tally sheets and monthly reporting forms.

Sections of the forms are pictured in order to make it easy for users to find the place in the manual where that section of the form is covered.



CAPACITY BUILDING

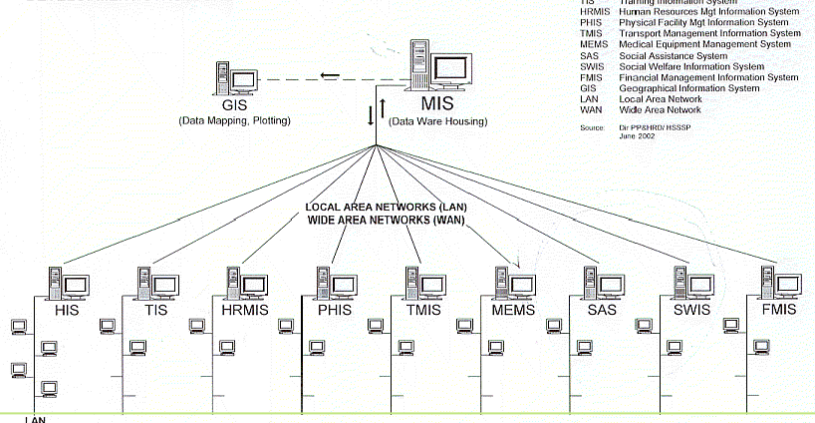
HIS training workshops are being organized annually to strengthen the capacity at national, regional and district levels to generate, analyse and utilize HIS data for management and planning purposes.

CHART OF INDICATORS AND PROGRESS (CHIPS)

In order to help and encourage staff at facilities to use some of the data they gather and report to the HIS each month, HIS introduces the FHIS and CHIPS (**F**acility **H**ealth **I**nformation **S**ystem **C**Hart of **I**ndicators and **P**rogress**S**).

CHIPS is a chart or graph format, supplied in a pad to each facility that staff can use for keeping regular track of progress or chart indicators they select to monitor.

PROPOSED MOHSS INTEGRATED INFORMATION SYSTEMS DEVELOPMENT STRUCTURE



Strengthening National Health Management Information System (HMIS) in Zambia

[Achievements, Challenges, Constraints and Wayforward]



Chipalo Kaliki
(Documentation and Statistics Specialist)
Central Board of Health (CBoH)-Zambia



Workshop on Strengthening National Health Information System
Harare, Zimbabwe 1-5th July, 2002

What is HMIS?

- **HMIS Stands for Health Management Information System.**
- **HMIS was designed in the context of health reforms.**
- **HMIS is a routine monitoring and evaluation system.**
- **HMIS collects, compiles & aggregates data on disease epidemiology and service delivery related indicators.**



Workshop on Strengthening National Health Information System
Harare, Zimbabwe 1-5th July, 2002

What is HMIS? Continued...

- **HMIS Disease Epidemiology and Service Delivery related indicators are categorized as follows:**

Disease Epidemiology Indicators	Service Delivery Indicators
<ul style="list-style-type: none">■ Immunisable Diseases. (e.g AFP, Measles, NNT, etc)■ Communicable Disease. (e.g Malaria, Respiratory infection, Diarrhoe, etc)■ Maternal and Perinatal Diseases. (e.g. Complication of pregnancy & comp. of Delivery)■ Nutritional Diseases (Protein Energy Malnutrition, etc)■ Other Diseases (e.g anaemia, dental diseases etc.).	<ul style="list-style-type: none">■ Maternal Health and Family Planning Indicators (e.g live births, still births).■ Curative Care Indicators (e.g Out patients visits, inpatient admissions, etc.).



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Background of HMIS

- **Health reforms led to the implementation of HMIS as a monitoring and evaluation tool.**
- **Design and testing of the system was done from 1996 to 1998.**
- **Training was done from 1997 to 1998.**
- **Hospitals were introduced to the HMIS from 1998 to 2001.**

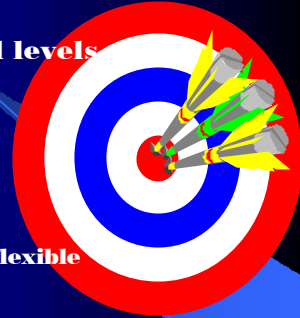


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DART HMIS Principles

- **Decentralized**
Analysis & self-assessment done at all levels
- **Action Oriented**
Data is collected for decision making
- **Responsive**
Appropriate timing of reporting and feedback; flexible
- **Transparent**
Information is easy to obtain



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Types of Reporting Forms

The following are the types of reporting forms

- **Aggregate based:**
 - Disease Aggregation Forms (HIA1)
 - Service Delivery Aggregation Forms (HIA2)
 - Tuberculosis notification forms
 - Weekly and monthly reports respectively - ND2 and ND3
- **Case-based:**
 - Notifiable Disease Case Based Forms Daily [(ND1)]
 - Other disease specific case based investigation forms e.g AFP, NNT, etc

Aggregated on
Quarterly basis



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Data Flow

The Old System

Central HQ
(aggregation)

↑

Province
(aggregation)

↑

District
(aggregation)

↑

Health Centre
(data collection
and aggregation)

The New HMIS

Central Board

↕

Province
(Aggregation)

↕

District
(Aggregation)

↕

Health Centre
(data collection
and aggregation)

Action

Analysis

Action

Analysis

Action

Analysis



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Overall Challenges of the National Health Information System

- **Unrealistically high coverage figures for some indicators e.g. immunization coverage of over 100%.**
- **Insufficient information in some reporting formats e.g. OPV and DPT1 & 2 no longer being reported.**



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Constraints

- **Inadequate trained human resources in HMIS.**
- **Inadequate and untimely distribution of stationary.**
- **Late submission of reports arising from long distances for some health centres.**



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Way forward

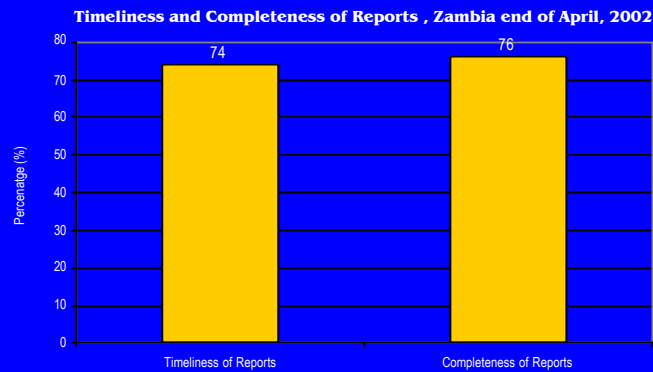
- **Need to intensify supportive visit supervision to districts and provinces.**
- **Need to harmonize different reporting systems in order to ensure reliability & validity of data to be disseminated.**



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Way forward continued....

- **Need to strengthen the timeliness & completeness of reporting system.**



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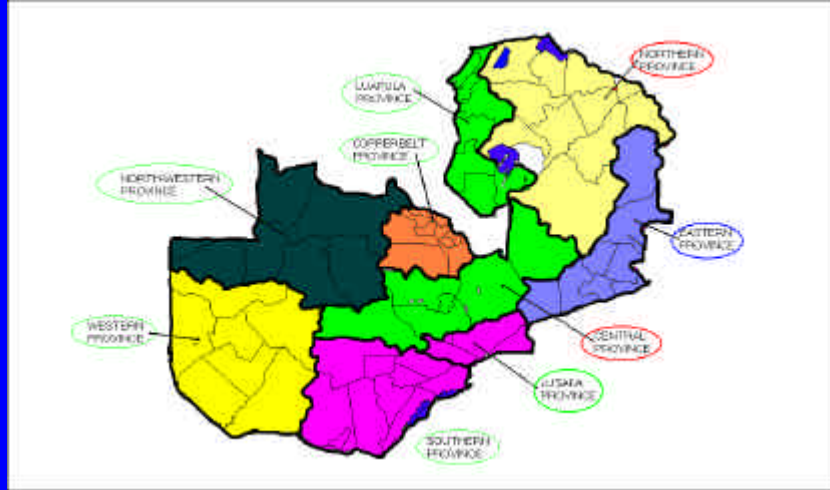
Way forward continued...

- **Need to redesign the HMIS data base so as to 'trap' errors at data collection and data entry levels.**
- **Need to strengthen capacity building in data analysis at all levels.**
- **Need to orient all managers of data at district, provincial and national level in Geographical Information System (GIS) Health Map.**



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Map of Zambia Showing 9 Provinces



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ZIKOMO KWAMBILI



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Harare, Zimbabwe 1-5th July, 2002

SEYCHELLES EXPERIENCE IN THE COLLECTION OF DATA AND UTILIZATION OF RELEVANT INDICATORS

BY

JOACHIM DIDON

HEALTH INFORMATION SYSTEM SECTION,
SEYCHELLES

Health Information Systems,
Seychelles

1

SEYCHELLES



Courtesy of New Adventures and the Seychelles Super Site

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Seychelles

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Introduction

- The main purpose of the presentation is to share experience with participants on how we have perceived data collection in the health sector in Seychelles and how relevant health Indicators have been utilized in order to assess the progress and performance of the Health System.

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Topics of Discussion

- Seychelles Geography.
- Health System.
- Data Collection: Strengths and Weaknesses.
- Health Indicators and utilization.

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Seychelles Geography

- Consists of 116 islands scattered over 1 million square kilometers of sea in the western Indian Ocean.
- Mahe, the main island is 4 degrees south latitude and 55 degrees east longitude. It is 27 kms long and 11 kms wide.
- Praslin, the 2nd biggest is 33.6 kms from Mahe.
- La Digue, the 3rd biggest is 48 kms from Mahe.
- The temperature varies from 28 to 33 degrees Centigrade from November to April and from 22 to 30 degrees from May to September.
- Rainfall varies considerably from island to island and year to year.

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The Health System

- The Health System is a three-tier system composing of :
 - Primary Health Care which comprises 16 government health centres, 3 of which have inpatient facilities, 2 government clinics and 5 private clinics.
 - Hospital Services are mainly concentrated Centrally in the Capital, Victoria, where services like X-Ray. CT Scan and other specialist treatment are present.
 - Disease Prevention and Control is another division covering Environmental Health, Communicable Disease Control, Occupational Health and others.

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Other Supportive Systems

- The Health Promotion and Education Division includes the different health programmes.
- The administration and human development division dealing with personnel, human resources and administrative issues.
- The Planning, research and information Division which harbours the Health information Systems including disease surveillance.

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Data Collection

- Type of Data Collected includes:
- Vital Statistics.
- Mortality.
- Morbidity data mainly Notifiable Diseases including STIs and inpatient data.
- Usage of Health services, including clinic attendances at both specialist and primary health care levels.
- Supportive services e.g. laboratory, X-Ray, physiotherapy etc..

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Data Collection

- **Strengths.**
- Has a very good vital registration system covering all births, deaths and marriages.
- There is a strong culture and practice of routine collection of health data from Health Centres and various other points.
- Tremendous amount of data is currently generated and collected by dedicated staff at all levels.
- HIS-related forms are completed and forwarded diligently and quite timely as required.

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Data Collection

- **Weaknesses.**
- There is still room for training of certain staff supplying the data on the importance of this job.
- Data collected, although of value, is sometimes duplicative, excessive, lack quality control and tends to overwhelm health personnel at the most peripheral level.
- Lack of proper guidelines for certain data collected.
- Turnover of doctors is sometimes high.
- Lack of knowledge of some practitioners on the usage of ICD codes and deficiency in causes of deaths.
- No returns from the majority of private practitioners.
- Room for more training of human resources.
- No data received from certain sections in MOH.

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Health Indicators and Utilization

Definition of Indicator:

- Indicators are variables that help to measure changes, directly or indirectly (WHO 1981).
- Indicators are “an indirect measure of event or condition.” For example, a baby’s weight for age is an indicator of the baby’s nutritional status (Wilson & Sapanuchart, 1993).
- Indicators are variables that indicate or show a given situation, and thus can be used to measure change (Green, 1992).
- What is most important is that when indicators are selected they should be useful and lead as much as possible to action.

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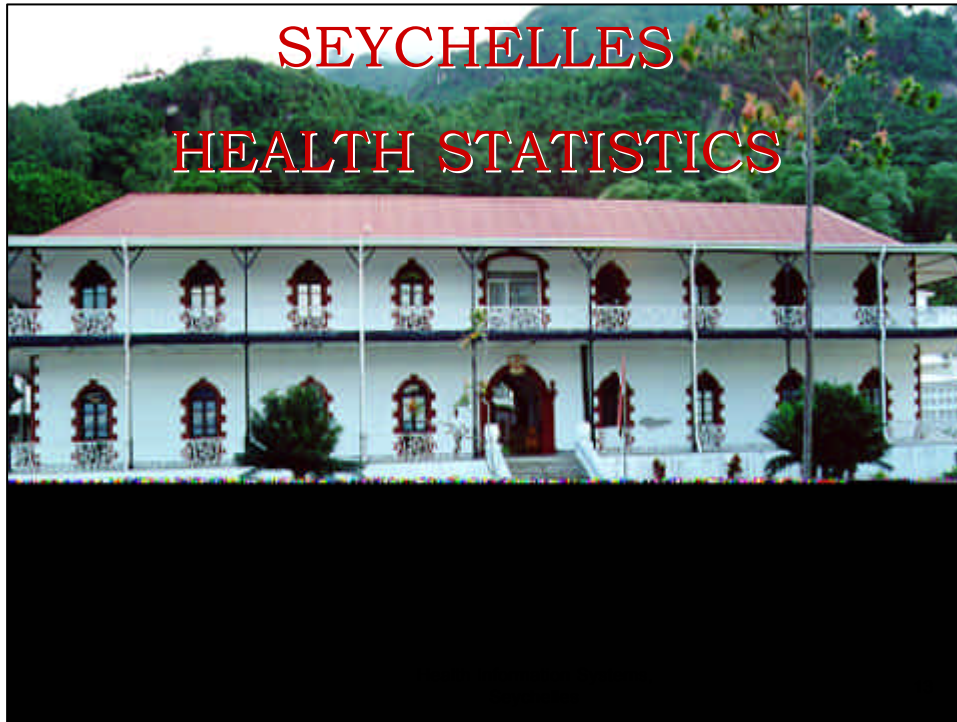
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Health Indicators

- **Type of Indicators**
- **Count indicators** simply measure the number of events without a denominator e.g. number of newly detected cases of tuberculosis.
- **Proportion indicators** usually expressed as percentage and the numerator is contained in the denominator e.g. number of health centres without dental services per total number of health centres.
- **Rate indicators** measure the frequency of an event during a specified time period, usually expressed per 1000 or 100000 population e.g. IMR.
- **Ratio indicators** are indicators for which the numerator is not included in the denominator e.g. ratio of male AIDS deaths to female AIDS deaths.

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Seychelles - population 1999 to 2001

Year	1999	2000	2001
Population	80,410	81,130	81,202
Male	40,199	40,249	39,973
Female	40,211	40,881	41,229
0-14 yrs	26.8%	26.3%	26.2%
Over 65 yrs	7.3%	7.3%	7.4%
Life Expectancy at Birth (Years)			
Male	67.36	67.93	67.35
Female	78.22	77.92	79.40
Both sexes	72.44	72.72	72.50

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Seychelles - basic statistics 1999 to 2001

Year	1999	2000	2001
Births	1,459	1,512	1,440
Crude birth rate (per 1,000 pop)	18.1	18.6	17.7
Deaths	559	553	554
Crude death rate (per 1,000 pop)	7.0	6.8	6.8
IMR (per 1000 live births)	10.3	9.9	13.2
Child Mortality Rate (per 1000 1-4 pop)	0.2	0.9	0.5
Maternal Mortality Rate (per 100,000 LB)	0.0	0.0	0.0

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Seychelles - health services 1999 to 2001

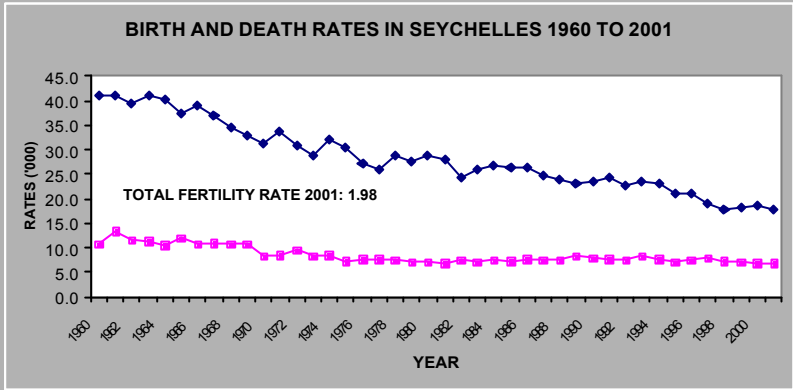
Year	1999	2000	2001
Doctors	105	95	89
Dentists	15	16	14
Nurses	353	385	394
Hospital beds	426	420	413
Admissions	12,847	12,224	10,827
Occupancy rate	69%	71%	66%
Average length of stay (days)	3.66	4.65	4.65
Doctors consultation at PHC	295,571	294,486	277,122
Visits per person at PHC	3.7	3.6	3.4
Specialists consultation	120,873	127,549	124,486

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Seychelles

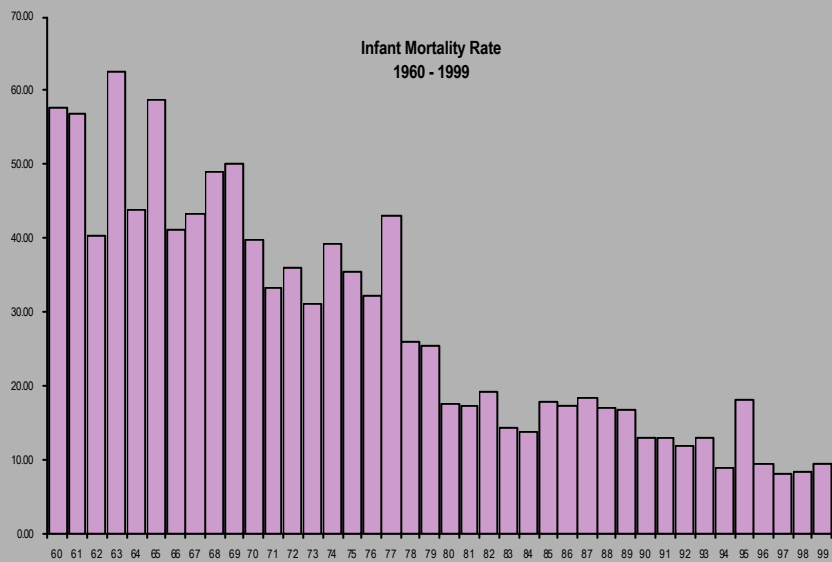
16

BIRTHS AND DEATHS

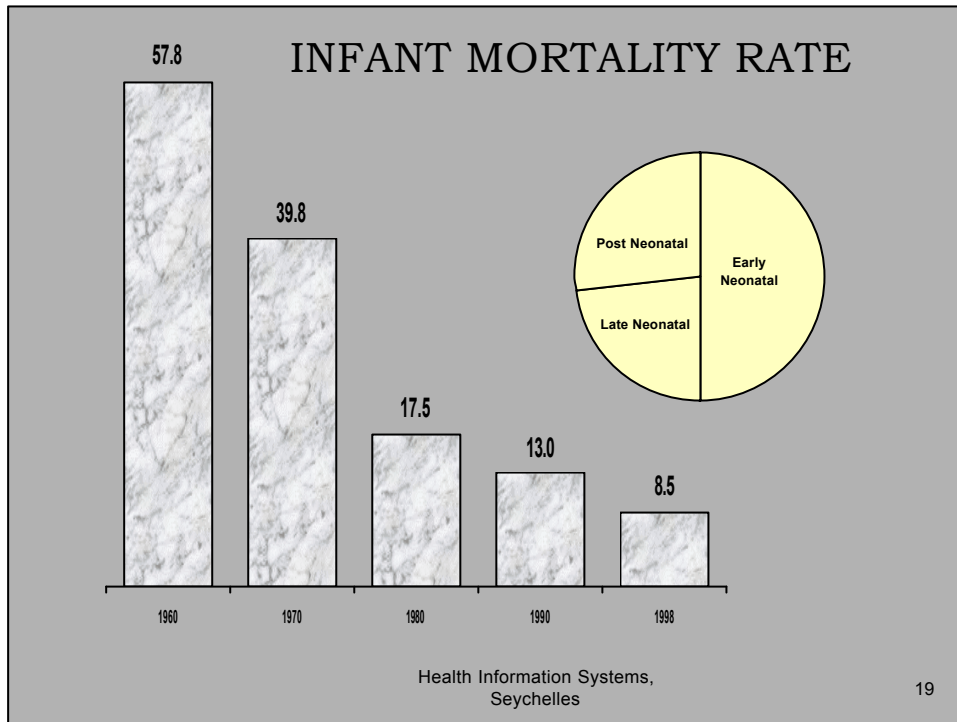
Main Causes of Death in 2001		
Diseases of the Circulatory System	198	35.74%
Neoplasm	95	17.15%
Infections	38	6.86%
Others	223	40.25%
Total	554	100.00%



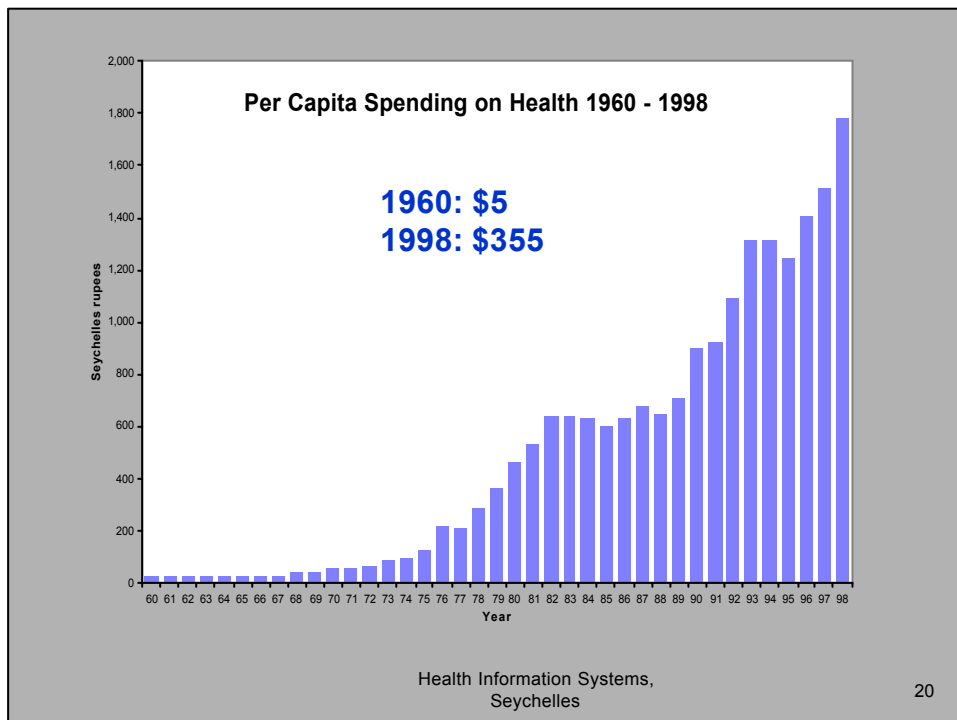
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18



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SEYCHELLES EXPERIENCE IN THE
COLLECTION AND UTILIZATION OF
RELEVANT INDICATORS

73	5,027,002	43,090,907	12%	56,892	88	18	31.1		
74	5,657,296	58,719,801	10%	57,937	98	20	39.2		
75	7,244,731	74,178,127	10%	59,292	122	24	35.4		
76	13,245,100	99,923,673	13%	60,504	219	44	32.3		
77	12,668,160	148,526,373	9%	61,786	205	41	43.2		
78	17,755,600	205,244,100	9%	62,150	286	57	26.2		
79	22,544,000	294,048,000	8%	62,686	360	72	25.4		
80	29,300,000	358,709,000	8%	63,261	463	93	17.5		
81	33,735,000	383,856,000	9%	64,035	527	105	17.2		
82	40,954,000	408,598,000	10%	64,413	636	127	19.3		
83	40,954,000	438,908,000	9%	64,335	637	127	14.4		
84	40,954,000	409,127,000	10%	64,717	633	127	13.8		
85	39,000,000	549,315,000	7%	65,244	598	120	17.9		
86	41,500,000	561,600,000	7%	65,653	632	126	17.5		
87	46,156,000	778,947,000	6%	68,499	674	135	18.4		
88	44,278,000	794,351,000	6%	68,755	644	129	17.0		
89	48,790,000	928,156,000	5%	69,167	705	141	16.9		
90	62,172,000	1,073,799,000	6%	69,507	894	179	13.0		
91	65,034,000	1,017,697,000	6%	70,438	923	185	12.9		
92	76,929,000	1,301,810,000	6%	70,763	1,087	217	11.9		
93	94,625,000		#DIV/0!	72,253	1,310	262	13.0		
94	96,826,000	1,122,847,000	9%	73,850	1,311	262	8.8	#####	4.0%
95	93,505,000		#DIV/0!	75,304	1,242	248	18.3	#####	3.9%
96	#####	1,081,405,000	10%	76,417	1,402	280	9.3	#####	4.3%
97	#####	1,101,807,000	11%	77,319	1,514	303	8.1	#####	4.3%
98	#####	1,212,666,000	12%	78,845	1,776	355	8.5	#####	4.8%
99	#####	1,183,758,000	11%	80,410	1,682	336			#DIV/0!

Notes:

- Health budget refers to amount allocated at the beginning of the year
- Figures are in Seychelles rupees

Figures in Dollars						
YEAR	AMOUNT TO HEALTH	TOTAL BUDGET	% TO HEALTH	POP	SPENDING PER CAPITA	IMR
77	2,533,632	29,705,275	9%	61,786	41	43.2
78	3,551,120	41,048,820	9%	62,150	57	26.2
79	4,508,800	58,809,600	8%	62,686	72	25.4
80	5,860,000	71,741,800	8%	63,261	93	17.5

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Spending on Health 1998

**Allocation to Ministry of
Health:**

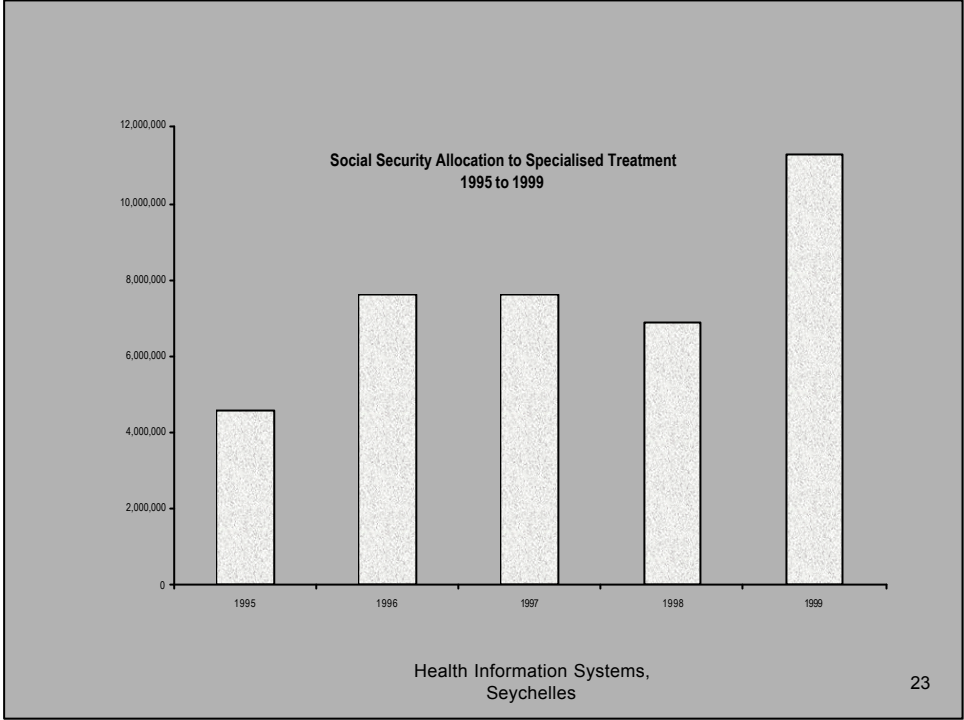
12 % of national budget

4.8 % of GDP

**Both underestimate real spending on
health and health care services.**

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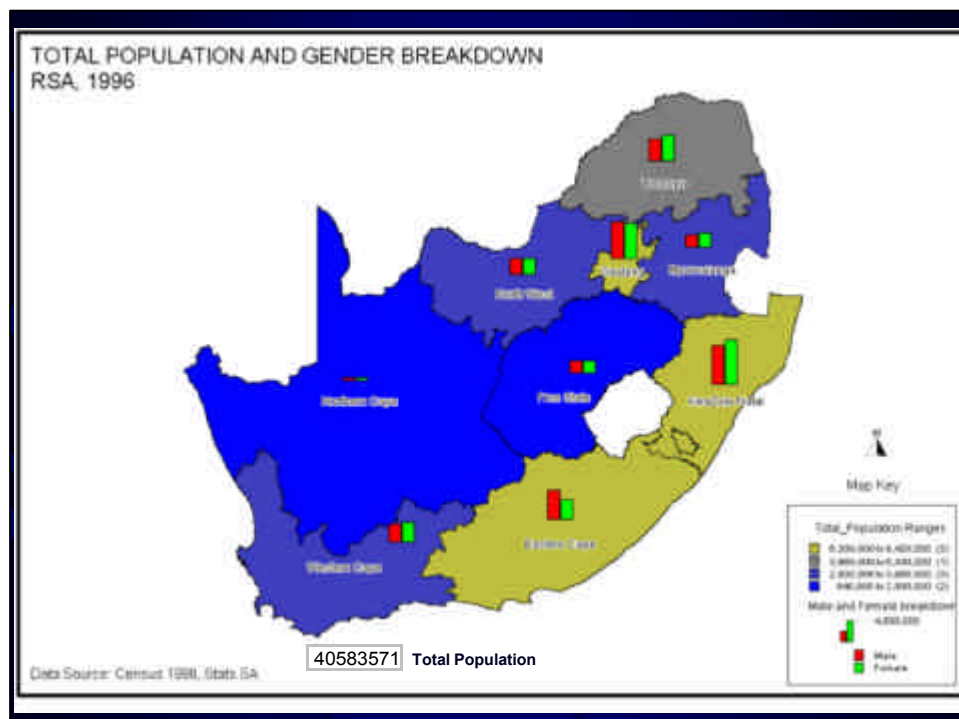


Strengthening National Health Information Systems

using GIS

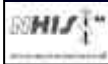
Aphane MJ

National Health Information Systems
Department of Health, South Africa
July 2002



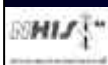
Overview

- Aim of the Presentation
- Background
- ReHMIS
- Problems with ReHMIS
- DHIS
- GIS (issues)
- Ideas



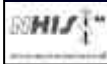
Aim of the Presentation

- One view of several issues.
- Systems integration & reporting.
- Specific issues from a GIS point of view.
- General issues summarised by Steve Sapiries.



Background

- NHIS/SA established by the minister in 1994
- A public-private committee guided by five pillars (for more www.health.gov.za)
- One of the main pillars in the strategy document is guided by these principles:
 - Data to be collected at its generation.
 - Data collection is to enable service assessment as well as self-assessment.
 - Service delivery personnel would have responsibility for data collection.
 - Basic analysis at the point of collection.
 - Collection, aggregation & analysis will follow organisational structure of health services.
- In April 1995, the committee developed ReHMIS.



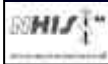
Problems with ReHMIS

- Too much data
- Systems user interface not friendly
- Specialised skills required to operate, e.g SQL



DHIS & other systems

- Major breakthrough – implemented strictly following NHIS/SA principles.
- Less impact as hospitals are still running their own systems (e.g. Medicom, Oasis, Systech Meditech, Unicare, Paab and Pads).
- But making inroads as it has a GIS module for spatial data capturing.



GIS

- Adds the geographic analysis dimension to information by providing an interface between information and a map.
- The Ministry has established a functional GIS unit which also has several problems.



GIS Issues

- Lack of personnel – one person responsible for running the entire unit called: management of databases.
- No database management systems.
- Poor data quality – good data mostly with private companies.



A

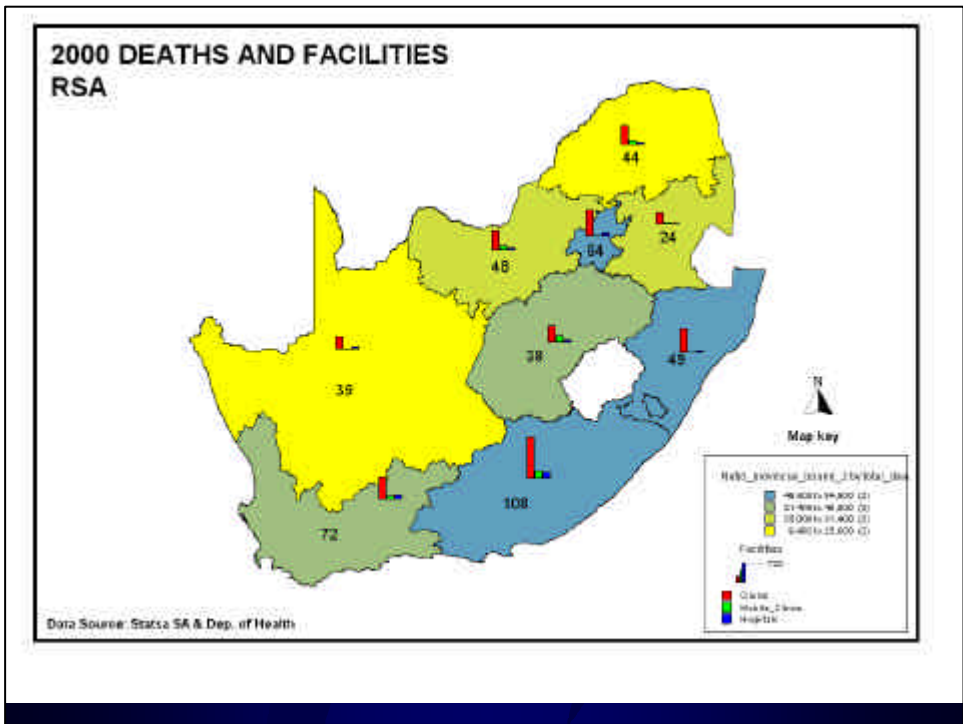
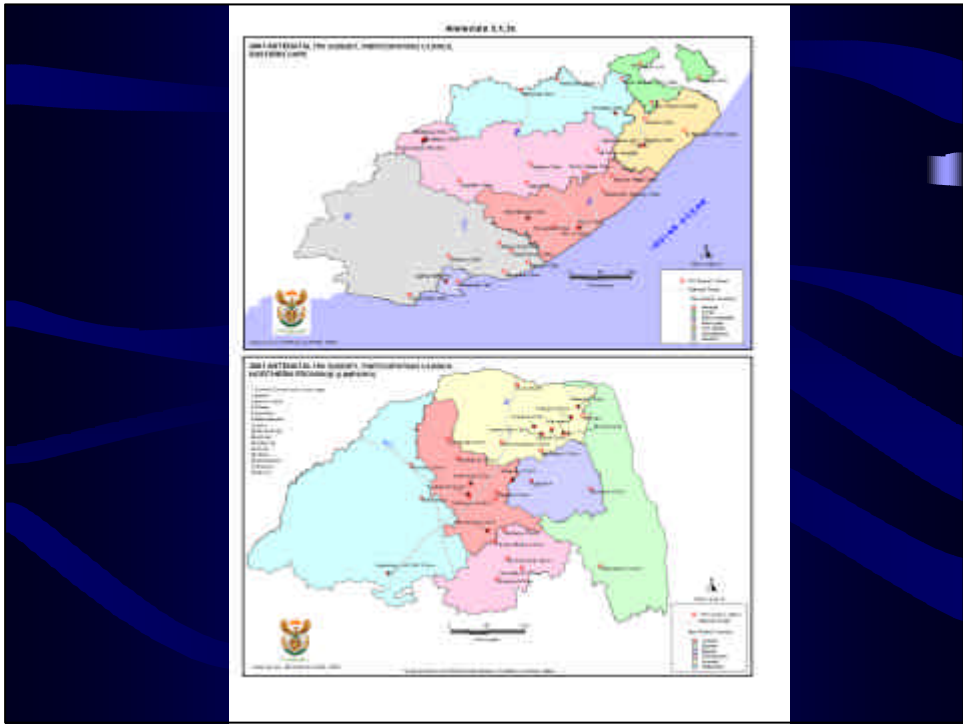
Name	Type	Source	Town	District
Edenburg Clinic	Clinic	RHEMIS98	Edenburg	EDENBURG
Edenburg Clinic Edenhoogte	Clinic	RHEMIS98	Edenburg	EDENBURG
Edenburg Clinic Ha-Rweebi	Clinic	RHEMIS98	Edenburg	EDENBURG

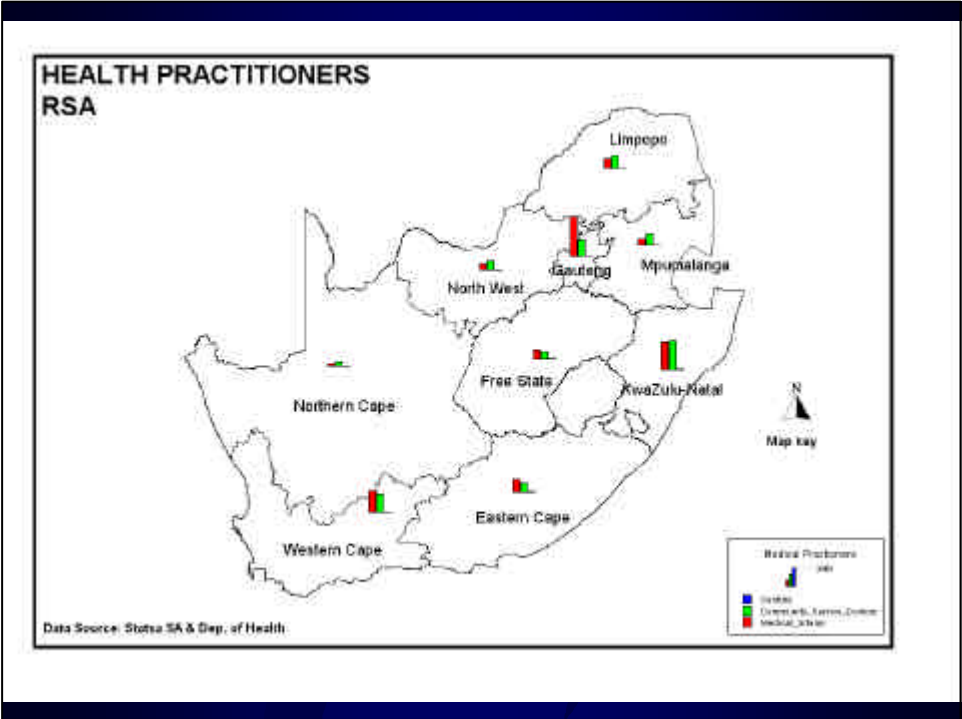
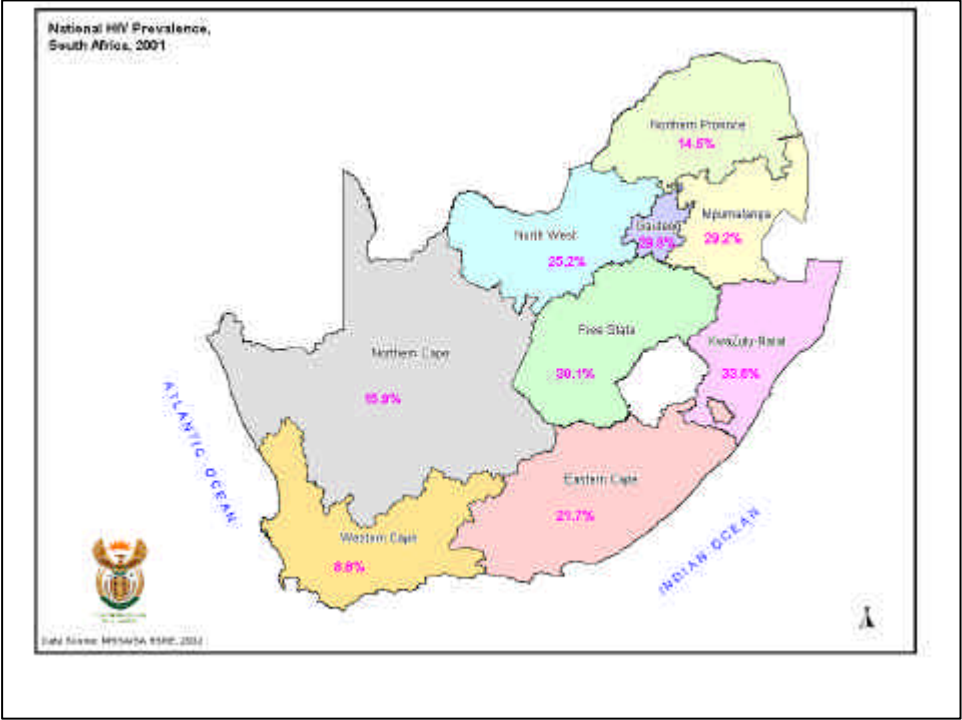
B

Facility	Type	Source	MD	DC
Clocolan Hospital	Hospital	HISSP_2002	Clocolan	Phabé Mototoanyana
Edenburg Clinic	Clinic	HISSP_2002	Edenburg	Shamep

C

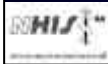
ORGUNIT	OUTYPE	SOURCE	MUNIC	D MUNIC
ec Aberdeen Hospital	District Hospital	DHIS_2002	ec Camdeboo Local Municipality	ec Western District Municipality
ec Aberdeen Mobile	Mobile Service	DHIS_2002	ec Camdeboo Local Municipality	ec Western District Municipality
ec Aberdeen Satellite Clinic	Satellite Clinic	DHIS_2002	ec Camdeboo Local Municipality	ec Western District Municipality
ec Ackee Street Mobile	Mobile Service	DHIS_2002	ec Nelson Mandela Metropolitan	ec Nelson Mandela Metropolitan
ec AD Keel Clinic	Clinic	DHIS_2002	ec Kouga Local Municipality	ec Western District Municipality





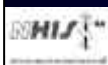
Ideas

- Separate systems collect data.
- How to use data from these systems at national level to provide a snapshot of the health status of the nation.
- Well GIS is an integration system but it is only a reporting tool.
- Need for a way to integrate data from different systems and store in a central place.



Spatial Data warehouse

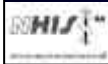
- A data warehouse capable of storing and analysing the spatial component of operational data.
- A data warehouse is a subject-oriented, integrated, time variant, non-volatile data repository that supports decision-making (ESRI, 1998).



THANKS

Website : www.health.gov.za

Email: jamesa@health.gov.za



Zimbabwe Experience in the Utilisation of HealthMap

By: LB Dube

National Health Information and
Surveillance Co-ordinator

Zimbabwe Experience in the Utilisation of HealthMap

Background

- 1991: Maps have been in use to strengthen diseases surveillance.
- 1995: Public Health Initiative to develop GIS/Mapping System of Health Facilities.
- 1998-9: GIS training of PMD and PHIO and MPH students.
- 1998: HealthMapper first introduced by WHO to strengthen malaria surveillance .
- 2002 Introduction as a public health disease surveillance tool.



Zimbabwe Experience in the Utilisation of HealthMap

Progress

● **May 2002 at National Level:**

- **Sensitised staff on HealthMap.**
- **Inventory of computers to determine their capacity.**
- **Upgrading of the computers with limited capacity.**
- **Installation of software in all computers with adequate capacity in the Health Information and Surveillance Unit (HISU).**



Zimbabwe Experience in the Utilisation of HealthMap

Progress (cont'd)

● **May 2002 at National Level:**

- **Mobilisation of resources.**
- **Requests for computers with adequate capacity.**
- **Training of HISU staff.**
- **Training of 2 DHE members in 10 RBM districts on health mapper and Malaria data management.**
- **Inventory of computers in the districts and provinces (May to July 2002).**



Zimbabwe Experience in the Utilisation of HealthMap

Uses:

To strengthen

● **Rapid Disease Surveillance System:**

- Malaria.
- Diarrhoeal diseases e.g. cholera, dysentery.
- EPI target diseases.
- Zoonotic conditions.

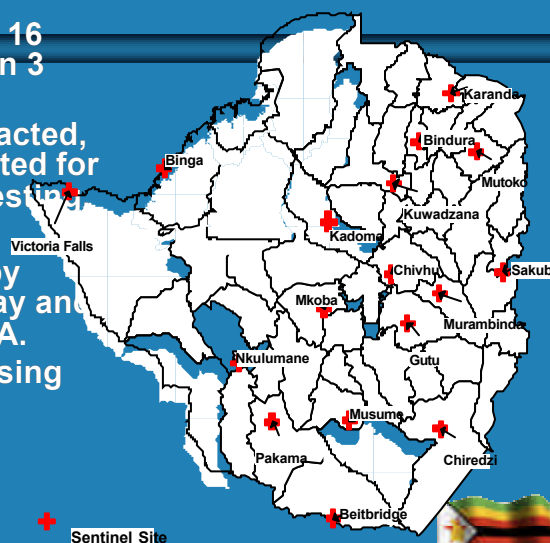
● HIV sentinel surveillance.

● National Health Profiles.



Methods: HIV Sentinel Survey in Antenatal Clinics, Zimbabwe, 2001

- 330 consecutive ANC attendees registered in 16 sentinel sites and 550 in 3 large cities.
- Demographic data extracted, 5mls extra blood collected for anonymous unlinked testing.
- Testing of specimens by Genlavia MIXT HIV assay and the Biotech Kit for TPFA.
- Central data analysis using Epi 2000 and SAS.



Zimbabwe Experience in the Utilisation of HealthMap

Limitations

- Inadequately trained staff.
- High staff turnover.
- Inadequate computers with CD rom.
- Use of HealthMap still limited to national level.
- Some clinics/primary care facilities not yet included due to latitude and longitude issues.
- Private sector data not used.



Zimbabwe Experience in the Utilisation of HealthMap

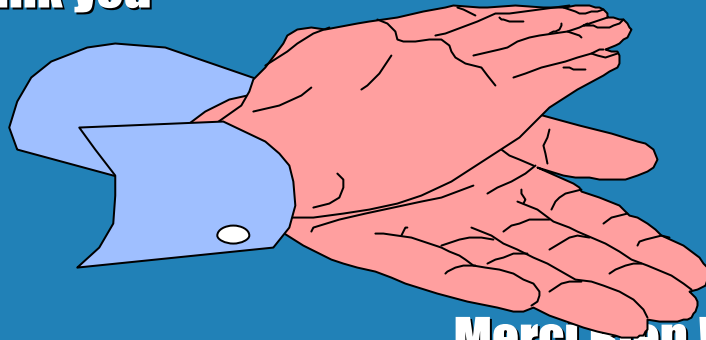
Way Forward:

- Continue to train and support staff up to district level.
- Train programme and data managers in the use of HealthMap.
- Continue to mobilise resources.
- Improve quality of data through validation and use at each level.
- Districts to include missing health facilities.
- Districts and Provinces to produce reports with health maps (evidence of use).
- Monitor and evaluate use of the system regularly.
- Involve cities and private sector.



Mazviita, Siyabonga, Zikomo

Thank you



Merci bien !



