

Mental Health Policy and  
Service Guidance Package

# MENTAL HEALTH INFORMATION SYSTEMS



World Health Organization

*"A mental health information system is a system for action: it should exist not simply for the purpose of gathering data, but also for enabling well-informed decision-making in all aspects of the mental health system."*



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This module is part of the WHO Mental Health Policy and Service Guidance Package, which provides practical information for assisting countries to improve the mental health of their populations.

### **What is the purpose of the guidance package?**

The purpose of the guidance package is to assist policy-makers and planners to:

- develop policies and comprehensive strategies for improving the mental health of populations;
- use existing resources to achieve the greatest possible benefits;
- provide effective services to people in need; and
- assist the reintegration of people with mental disorders into all aspects of community life, thus improving their overall quality of life.

### **What is in the package?**

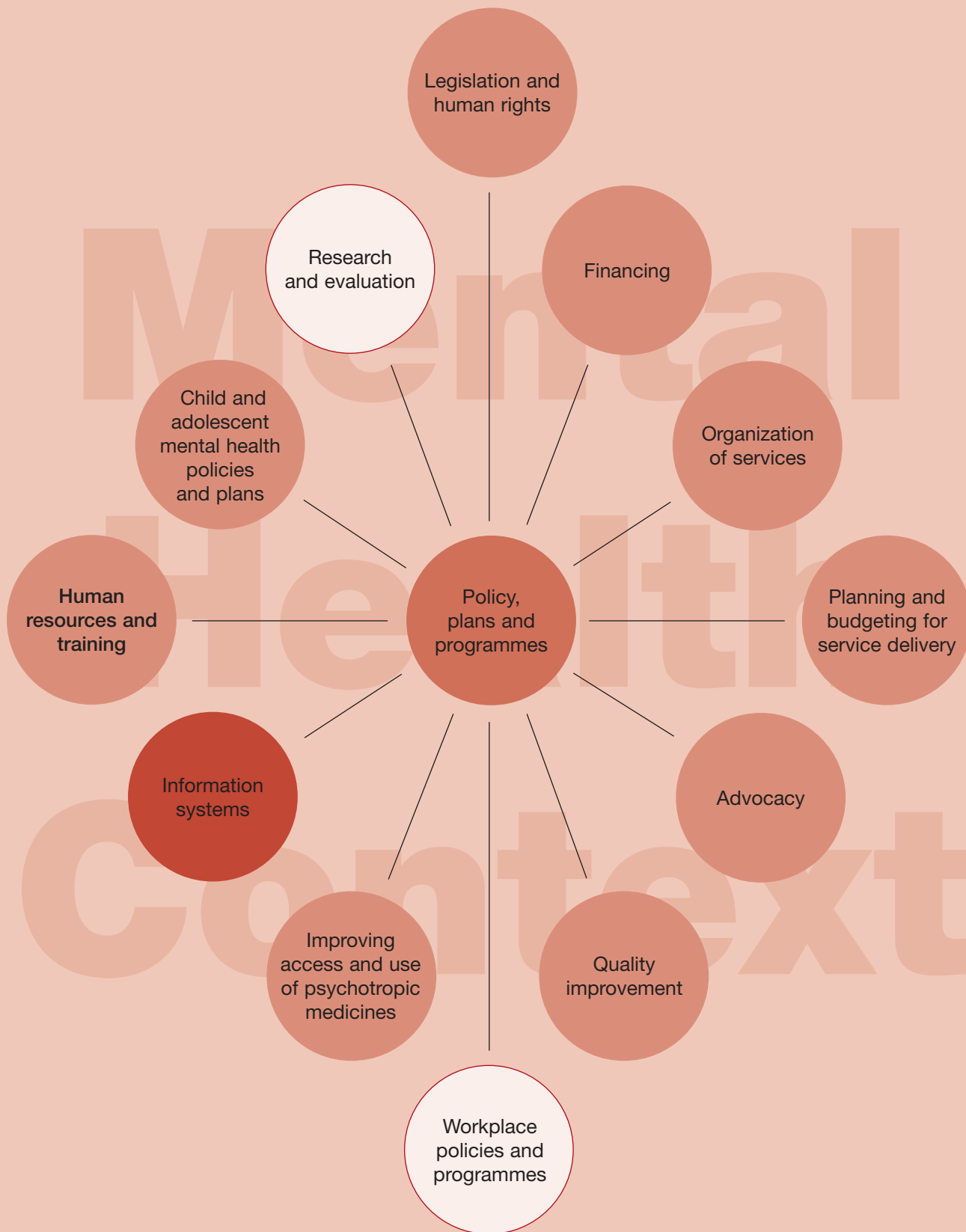
The guidance package consists of a series of interrelated, user-friendly modules that are designed to address the wide variety of needs and priorities in policy development and service planning. The topic of each module represents a core aspect of mental health.

The guidance package comprises the following modules:

- The Mental Health Context
- Mental Health Policy, Plans and Programmes
- Mental Health Financing
- Mental Health Legislation and Human Rights
- Advocacy for Mental Health
- Organization of Services for Mental Health
- Planning and Budgeting to Deliver Services for Mental Health
- Quality Improvement for Mental Health
- Improving Access and Use of Psychotropic Medicines
- Child and Adolescent Mental Health Policies and Plans
- Human Resources and Training for Mental Health
- Mental Health Information Systems

The following additional modules are planned for inclusion in the complete guidance package:

- Research and Evaluation of Mental Health Policy and Services
- Workplace Mental Health Policies and Programmes



### **For whom is the guidance package intended?**

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The modules should be of interest to:

- policy-makers and health planners;
- government departments at federal, state/regional and local levels;
- mental health professionals;
- groups representing people with mental disorders;
- representatives or associations of families and carers of people with mental disorders;
- advocacy organizations representing the interests of people with mental disorders, and their families;
- nongovernmental organizations (NGOs) involved or interested in the provision of mental health services.

### **How to use the modules**

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- The modules can be used **individually or as a package**. They are cross-referenced with each other for ease of use. Country users may wish to go through each module systematically, or may use a specific module when the emphasis is on a particular area of mental health. For example, those wishing to address the issue of mental health legislation may find the module entitled *Mental Health Legislation and Human Rights* useful for this purpose.
- They can serve as a **training package** for policy-makers, planners and others involved in organizing, delivering and funding mental health services. They can also be used as educational materials in university or college courses. Professional organizations may choose to use the modules as aids for training persons working in the field of mental health.
- The modules can serve as a framework for **technical consultancy** by a wide range of international and national organizations that provide support to countries wishing to reform their mental health policies and/or services.

In addition, they can be used as advocacy tools by consumer, family and advocacy organizations. The modules contain information of value for public education and for increasing awareness amongst politicians, opinion-makers, other health professionals and the general public about mental disorders and mental health services.

### **Format of the modules**

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Each module clearly outlines its aims and the target audience for which it is intended. The modules are presented in a step-by-step format to facilitate use and implementation of the guidance provided. The guidance is not intended to be prescriptive or to be interpreted in a rigid way. Instead, countries are encouraged to adapt the material in accordance with their own needs and circumstances. Practical examples from different countries are used throughout the modules.

There is extensive cross-referencing between the modules. Readers of one module may need to consult another (as indicated in the text) should they wish to seek additional guidance.

All modules should be read in the light of WHO's policy of providing most mental health care through general health services and community settings. Mental health is necessarily an intersectoral issue requiring the involvement of the education, employment, housing and social services sectors, as well as the criminal justice system. It is also important to engage in consultations with consumer and family organizations in the development of policies and the delivery of services.

Dr Michelle Funk

Dr Benedetto Saraceno





### **1. Introduction**

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#### **1.1 What is a mental health information system?**

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A mental health information system (MHIS) is a system for collecting, processing, analysing, disseminating and using information about a mental health service and the mental health needs of the population it serves.

The MHIS aims to improve the effectiveness and efficiency of the mental health service and ensure more equitable delivery by enabling managers and service providers to make more informed decisions for improving the quality of care. In short, an MHIS is a system for action: it exists not simply for the purpose of gathering data, but also for enabling decision-making in all aspects of the mental health system.

#### **1.2 What are the main stages of an MHIS?**

---

With an MHIS, information goes through several stages. These include:

- (i) Collection – gathering of data.
- (ii) Processing – movement of data from the point where it was collected to a point where it can be collated and prepared for analysis.
- (iii) Analysis – examination and study of the data.
- (iv) Dissemination – communication of the results of the analysis.
- (v) Use – application of the data to improve service delivery, planning, development and evaluation.

It is important to emphasize that not all information needs to be processed at a central level. Some information may be retained in a health facility for analysis and use within that facility.

#### **1.3 From where should information be collected?**

---

Information should be collected from a variety of different mental health services. To make this possible, the appropriate systems need to be in place within these services. WHO has developed a model for an optimal mix of mental health services – the WHO pyramid framework – which can be used to help organize the place of collection as well as the type of information that needs to be collected.

In this pyramid framework, the most numerous services are self-care management, informal community mental health services and community-based mental health services provided by primary care staff; these are followed by psychiatric services based in general hospitals and in formal community mental health services, and lastly, by specialist mental health services. Many of these services will be integrated into the general health services. For the purpose of information systems, this module focuses only on primary care, psychiatric services based in general hospitals, formal community mental health services, and specialist mental health services.

#### **1.4 What types of information should be collected?**

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MHIS planners need to consider each level of the service organization pyramid when deciding what information is required. Different types of information need to be processed at different levels within the MHIS, and it is important to consider the practicalities of how one level relates to another.

To help MHIS planners make these decisions, it is necessary to distinguish between the different types of information needed:

- Episode-level information is required to manage an individual episode of service contact;
- Case-level information is required to care for an individual service user;
- Facility-level information is required to manage the specific service facility (whether the facility is a specialist institution, a mental health ward in a general hospital, a community mental health team, or a primary health care (PHC) clinic); and
- Systems-level information is required to develop a policy and plan for the mental health system as a whole.

#### **1.5 Benefits of an MHIS**

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There are several benefits generated by an MHIS. Information systems are an essential planning tool: they are a way of providing accurate, consistent information about a mental health service; they assist with coherent planning; and they are essential for policy implementation and evaluation. Information systems are also a service delivery tool to assist service providers with recording and monitoring the needs of individual service users; they provide a means of reporting the interventions that are used, and can be linked to the ongoing improvement of service quality. Information systems improve effectiveness by enabling the measurement of indicators explicitly determined by the policy framework of the mental health service. They also enable effective monitoring of the clinical interventions that are used. In addition, they improve efficiency by measuring how well a service is using its resources. As a tool for measuring need and coverage, the MHIS addresses a central challenge facing the mental health service, namely, providing equitable care with scarce resources.

#### **1.6 Common problems with health information systems**

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Although there are several benefits to information systems, many of these systems are beset with problems. These are encountered in each of the stages: collection, processing, analysis, dissemination and use. In the case of MHIS, particularly in developing countries, those involved in the design and maintenance of general health information systems (HIS) frequently do not have an adequate understanding of mental health. These problems are made worse by changes in the health system as a whole, in terms of both structure and staff turnover. Careful planning in the design and implementation of information systems is therefore essential for overcoming these common problems.

## **2. Principles of MHIS**

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The following principles are based on the experiences of several countries in the development of both HIS and MHIS.

### **2.1 Start small, but keep the big picture in view**

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As a first principle, planners should consider a progressive development of an information system, and not attempt to design the entire MHIS in detail from the outset. Efforts in the 1960s and 1970s to undertake this complex task frequently ran into difficulties. Rather than designing a large unwieldy system that cannot be implemented, it is preferable to start small and build according to successes and revealed needs.

At the same time, the bigger picture of the MHIS needs to be kept in view. This means that the team that designs the MHIS must review the needs and capacities of all the stakeholders in the MHIS, carefully considering what they could feasibly contribute and what they might gain from such a system.

### **2.2 Use indicators**

---

A second principle of MHIS is the use of well-defined indicators. Indicators are measures which: (i) summarize information relevant to a particular phenomenon; (ii) can be used to indicate a given situation; and (iii) can therefore be used to measure change. In the context of mental health care, indicators are measures that summarize information relevant to the mental health service and the population that it serves. As an important way of measuring change in a system, they are an essential tool in an MHIS.

It is necessary to make a distinction between indicators and raw data (or data elements). What distinguishes indicators from raw data is that indicators are aggregates of the minimum data that have a denominator. Both indicators and minimal data have value for information systems. At a case level, data frequently do not need to be converted into indicators (such as detailed case-level and transaction data). At a systems level, data need to be converted into indicators to enable overall service planning and policy evaluation.

Indicators can be used to measure various aspects of the mental health system:

- needs
- inputs
- processes
- outcomes

Traditionally, planners tend to focus on input and process indicators, both in evaluating services and in data collection. However, they generally find it difficult to build in outcome indicators. Yet outcome indicators are essential, since they can be used for planning interventions both at a broad (intersectoral) and a focused (service) level. They provide an invaluable means of evaluating the impact of interventions, from mental health promotion to preventive and treatment interventions such as medication and psychotherapy.

## **2.3 Establish a minimum data set**

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A third basic principle of any MHIS is that it should gather the minimum required information. A minimum data set means that only the least, most essential information is gathered and used. This principle underscores the goal of the MHIS, which is not simply to gather data, but also to enable decision-making.

## **2.4 Make the MHIS user-friendly**

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A fourth essential principle of MHIS is that it should be user-friendly. From the end-users who gather and use data during the clinical encounter, to those involved in processing, analysing and using the data to make planning and policy decisions, the purpose for which information is being gathered and used should be clear, consistent and accessible.

## **2.5 Clarify the relationship with information systems in the general health and other sectors**

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### **(a) Relationship with the general health information system (HIS)**

For the MHIS to be used for general health planning, it is essential that its relationship with the general HIS be clarified. Thorough consultation with planners and administrators involved in the design and implementation of the general HIS is therefore important.

A range of scenarios exists for the relationship between MHIS and HIS: full integration (in which mental health information is gathered as part of all other general health information), partial integration (in which mental health information might be gathered separately but processed to a central HIS centre for analysis), or complete separation (in which mental health information is collected, processed, analysed, disseminated and used in an entirely separate system to the HIS).

### **(b) Relationship with information systems of other sectors**

A second important area relates to sectors beyond the health sector. While there is growing awareness of the need to approach mental health problems intersectorally, little has been done to adjust information systems to this new awareness. An intersectoral relationship is particularly important for mental health, which spans health, social services, education, criminal justice, labour and other sectors, as well as nongovernmental organizations (NGOs).

## **2.6 Consult with all stakeholders**

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Because information systems require the participation of many stakeholders, consultation with these stakeholders is essential in the design and implementation of the information system. A variety of stakeholders have an interest in MHIS, and each stakeholder group has different information needs.

Consultation with all stakeholders is necessary not only because of the ethical imperative to consult with all those involved, but also because those stakeholders could make useful suggestions about the way the information system should be designed and what information should be gathered. In addition, people who have been consulted in the design and development of an information system are more likely to understand the system and participate in its implementation.

## **2.7 Link MHIS development to wider service development**

The development of an MHIS is most effectively undertaken in the context of wider mental health service development and reform. This has two major advantages: first, it results in an MHIS that is built on specific service and management functions; and second, the proposed MHIS can, by association with wider service reforms, draw on the political momentum and support generated for those reforms.

## **2.8 Consider routine and non-routine data**

Although information systems are “built into” the mental health service, this does not imply that they always need to gather routine data. Both routine and non-routine data are valuable for mental health service planning and delivery. Routine data refer to data that are gathered on a regular basis and used in routine service planning. Non-routine data are gathered on an irregular basis, and are often used to focus on a particular issue that may be of concern to planners, providers or service users.

## **2.9 Consider how epidemiological data should be included in the MHIS**

A crucial question that arises when planning an MHIS is: what is the role of epidemiological data, and how should such data be included in the MHIS? Epidemiological data are difficult to use in an MHIS for several reasons. As a general guide, for planning purposes they should be used in conjunction with other data in information systems. In the absence of epidemiological data, alternative methodologies may need to be employed (e.g. rapid appraisals, sentinel surveys and epidemiological information from other, similar countries), instead of using valuable and limited resources on expensive, complex and time-consuming epidemiological surveys. What is most urgent in developing countries is the need to develop accurate information systems that facilitate the monitoring of service delivery and its impact.

## **2.10 Ensure privacy, confidentiality, access to information and consent**

The foundation stone of any MHIS should be the privacy of those people whose personal information is required for service delivery and planning. The need for confidentiality arises when information becomes shared. It is therefore essential to take all measures necessary to ensure that private information in the MHIS is shared only with those professional staff who are required to have access to that information, and that personal identifiers are removed from the information if it is to be used further for the purpose of service planning.

## **2.11 Address specific mental health information needs**

Medico-legal procedures for the admission of people with mental disorders may require the collection of specific information, depending on current legislation in a country. The MHIS should therefore include these special information needs.

### **3. Steps in designing and implementing a mental health information system**

This module takes planners through a step-by-step process that will guide them on how to assess information needs, analyse current information systems, implement the planned information systems and evaluate them. This step-by-step process can be summarized in the form of four questions:

- What information do we need? (Needs assessment)
- What information do we have? (Situation analysis)
- How can we get the information we need? (Implementation)
- How well are information systems working? (Evaluation)

The planning steps in this module are set in a cycle. The cycle implies that the final step of evaluating the MHIS leads naturally to an identification of new information needs for the MHIS.

#### **Step 1. Needs assessment: what information do we need?**

##### **Task 1: Establish a task team**

The first task in a needs assessment is to establish a team that will take responsibility for designing and implementing the MHIS. A multidisciplinary task team, along with support from senior management, is essential.

##### **Task 2: Review current policy and planning objectives**

Once established, the first task of the team is to conduct a review of mental health policy and planning objectives. Information systems that are consistent with policy are more likely to produce the required minimum information with the limited resources that are available. This task requires the development of an overall vision for the information system: what is the MHIS setting out to achieve, and what policy and planning objectives need to be measured?

##### **Task 3: Consult with all relevant stakeholders**

Having reviewed existing policy and plans, the task team needs to undertake a consultation process with all stakeholders. This is a continuous process, which should be part of the preceding and subsequent steps.

##### **Task 4: Identify indicators to measure the policy and planning objectives**

The next task is to begin to translate the policy objectives and consultation into items (indicators) that can be measured by an information system. Indicators are key to measuring specific policy objectives and their implementation. Certain questions need to guide the selection of indicators, particularly their validity, reliability, cost, relevance, specificity, sensitivity, balance and the feasibility of collecting the needed data. These indicators also need to be located within the framework of the four subsystems and five stages of MHIS. By the end of this task, the team should have identified a set of indicators that could be used to measure key policy objectives.

## **Step 2. Situation analysis: what information do we have?**

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### **Task 1: Review the current situation**

---

The task team now needs to turn its attention to the existing information system. The purpose of the situation analysis is twofold:

- to examine what systems currently exist; and
- to identify problems in the current systems and areas where they could be improved.

The framework developed in the needs assessment can be used to identify which of the four subsystems can be found in current mental health information systems in the country or region. The team will then need to systematically map how the information is managed through each of the stages: collection, processing, analysis, dissemination and use.

### **Task 2: Conduct a “walk-through” analysis**

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A useful methodology for taking the review further is to conduct a “walk-through” of the current systems. This requires site visits to clinics and hospitals to track how data are collected and how data flow through the MHIS. The conclusion of the situation analysis should leave the task team with a clear understanding of any existing difficulties in the MHIS.

## **Step 3. Implementation: how can we get the information we need?**

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### **Task 1: Identify the essential MHIS subsystems and indicators**

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The task team can now proceed to bring together information from the needs assessment and situation analysis, to identify those priority areas of the MHIS that can feasibly be reformed, and to proceed with the reform. The team will need to systematically map how the information is to be managed through each of the stages and for each of the selected subsystems. This task will often quickly show what data can feasibly be collected, processed, analysed and used.

### **Task 2: Establish a minimum data set**

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Once the indicators are mapped, a minimum data set can be identified, based on what is feasible. This requires identifying what minimum data are required to provide substance to the identified set of indicators (i.e. operationalizing the identified indicators).

### **Task 3: Map the information flow**

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The next task is to map the information flow within the MHIS (collection, processing, analysis, dissemination and use).

### **Task 4: Establish frequency of data collection**

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The flow chart created in the previous task needs to be located in time, and for this reason it is important to identify the times during an annual cycle when information should be collected and processed.

#### **Task 5: Identify roles and responsibilities**

The next task is to identify the roles and responsibilities of all stakeholders in each of the stages of the information system.

#### **Task 6: Design and distribute materials**

Once roles and responsibilities are clarified and the system has been mapped with a time frame, the practical tasks of designing and distributing materials can begin. This includes drawing up instruction manuals and/or procedure manuals, as well as data collection forms.

#### **Task 7: Schedule staff training**

Training is required for managers, administrative and clinical staff in information gathering, analysis and use. The situation analysis in Step 2 should have revealed any existing gaps in current staff skills. This information can be used to target specific training needs in a country or region.

#### **Task 8: Address practical barriers to getting the needed information**

During the course of implementation of the MHIS, several barriers will inevitably be encountered. Two key areas are staff opposition and inadequate technology.

#### **Task 9: Build in quality checks**

As a way of addressing many of these obstacles to implementation, quality checks need to be built into the MHIS.

#### **Task 10: Conduct a pilot project**

A useful means of testing the feasibility of an MHIS, and ironing out implementation difficulties, is a pilot project.

#### **Task 11: Roll out the MHIS**

Once the pilot project has identified final implementation issues, the roll-out of the MHIS can begin, with “live” data collection and processing. The implementation procedure for roll-out of the MHIS should be clearly spelt out in an operational plan.

#### **Step 4. Evaluation: how well is the MHIS working?**

The implementation of an MHIS would not be complete without an evaluation. In this final step, the task team is required to evaluate the MHIS, now that it is up and running. It is important to emphasize that evaluation is an integral part of the design and implementation of an MHIS and should not be tacked on as an afterthought.

### **Task 1: Define the criteria for evaluating the MHIS**

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In establishing the criteria for evaluating the MHIS, clear definitions of each criterion are essential in order to clarify what aspect of the system the criterion is attempting to measure.

### **Task 2: Establish a framework for evaluation**

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In establishing a framework for evaluation, it is important to ask specific questions:

- Which main and specific aspects of the MHIS need to be evaluated?
- What perspective is needed or most useful?
- Which research instrument is most appropriate?

### **Task 3: Compare with the baseline assessment**

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The progress of the MHIS can be evaluated by repeating measures taken at baseline.

### **Task 4: Determine the frequency of evaluations**

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As a general principle, it is essential to conduct periodic evaluations of the MHIS. The frequency of these evaluations will depend on such aspects as availability of resources, difficulties encountered in the design and implementation of the system, and the complexity and scale of the system. As a way of maximizing resources, it may be useful to conduct routine evaluations at the same time as wider evaluations of the mental health system, for example, as part of routine service planning evaluations.

## **4. Conclusion**

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Information is crucial for decision-making at all levels of the mental health system. Policy-makers need information to make the best use of scarce resources, planners for the design of more efficient and effective services, managers for the monitoring and evaluation of services, and clinicians to provide appropriate, good quality, evidence-based care. In the context of limited resources, increasing decentralization and changes to the financing of mental health care, the quality of such data is becoming even more important.

This module provides a framework for MHIS through four steps: a needs assessment, a situation analysis of the current MHIS, implementation of a new system and evaluation. Although specific step-by-step guidance is provided, it is important that countries adapt this guidance to their own circumstances. Countries will need to adjust their sights according to their current resources, without compromising the quality of the system or the essential data that are needed. There are few quick solutions, and a long-term investment will be required.

### **Aims of the module**

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- To assist planners and service providers to develop mental health information systems.
- To support informed decision-making in all aspects of the mental health system.

### **Target audience**

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- Mental health planners
- Health information system managers
- Policy-makers
- Funding sources
- Service providers
- Advocacy groups

### **Why is a module on mental health information systems needed?**

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Mental health information systems (MHIS) are essential for all aspects of the mental health system. For policy-makers and planners, they provide a means of establishing goals and objectives for the country or region, and assessing whether those goals and objectives are being achieved. For mental health workers in the front line of service provision, such information systems provide a means of assessing the needs of service users and for monitoring their response to interventions. For people who use mental health services and for the wider population, they provide a means of being informed about the services they can receive and their likely outcomes.

Mental health needs are frequently neglected in health service management and health information systems (HIS). There are numerous examples from around the world of health information systems that do not routinely collect and utilize data related to mental health. This is in spite of evidence of the significant burden of disease posed by mental disorders, and the clear interdependence between mental and physical disorders. This module aims to inform HIS managers of the mental health aspects of HIS and the key issues that need to be addressed in developing the mental health component of an HIS.

Frequently, mental health service planners do not give information systems the priority they deserve. During WHO consultations with a range of countries, it is often heard that essential information for mental health service planning is simply not available. This is because many mental health service planners and managers lack the technical capacity to develop information systems. This module can help equip them with the necessary know-how to plan and implement such systems for mental health.

While many of the issues related to information systems are the same for HIS and MHIS, there are also many differences. Mental health facilities tend to handle fewer individuals than general health care facilities, but each individual requires access to more services (or hospital days-of-stay) over a longer period. Mental disorders tend to be chronic, not acute, in nature. As a result, clinical data are reviewed more over the long term than the short term. Mental health service organization may differ from that of general health services in certain aspects, and there may be a need for greater liaison or information exchange with other, non-health sectors such as criminal justice, education and housing, as well as with NGOs. There are other important differences between MHIS

and HIS in areas such as involuntary commitment, case management reviews, and the qualitative nature of some mental health data. All these areas tend to require different data structures from those used by general health care systems.

In this module, MHIS is not considered to be a separate system from an existing HIS. Indeed, much of the guidance provided in this document is aimed at assisting the reader to develop an MHIS that is compatible with the HIS. In so doing, this module builds on and attempts to maintain a consistent approach to the important developments made in HIS planning and development, particularly by WHO (WHO, 2000). The module should not be used in isolation; it is intended to be used in conjunction with the references cited in the text, and with other resources and expertise that may be identified by the country staff concerned.

The development and implementation of an MHIS will depend on the specific circumstances and needs of countries. The guidance provided in this module therefore needs to be adapted to the context within which it is utilized.

Given the scale of the topic, it is not possible to provide detailed guidance on all aspects of MHIS development. Instead, broad guidance is provided, and illustrated with specific examples of best practice from a range of countries. Readers are referred to the literature cited in the text for more information.

## 1.1 What is a mental health information system?

A mental health information system (MHIS) is a system for *collecting, processing, analysing, disseminating* and *using* information about a mental health service and the mental health needs of the population it serves.

The MHIS aims to improve the effectiveness and efficiency of the mental health service and its equitable delivery by enabling managers and service providers to make well-informed decisions that improve the quality of care. In short, an MHIS is a system for action: it exists not simply for the purpose of gathering data, but also for the purpose of enabling informed decision-making in all areas of the mental health system (WHO, 2000).

An MHIS does not need to rely on computerization. There are various possibilities for information systems: entirely manual systems, partially electronic systems (e.g. manual collection and entry into an electronic system for later computer-based analysis), and entirely electronic systems (e.g. data are collected electronically from the outset).

## 1.2 What are the main stages of an MHIS?

In an MHIS, information has to go through several stages. These include:

1. Collection – gathering of data.
2. Processing – movement of data from the point where it was collected to a point where it can be collated and prepared for analysis.
3. Analysis – examination and study of the data.
4. Dissemination – communication of the results of the analysis.
5. Use – application of the data to further service delivery, planning, development and evaluation.

To make these stages possible, certain information management systems need to be in place (WHO, 2000), including:

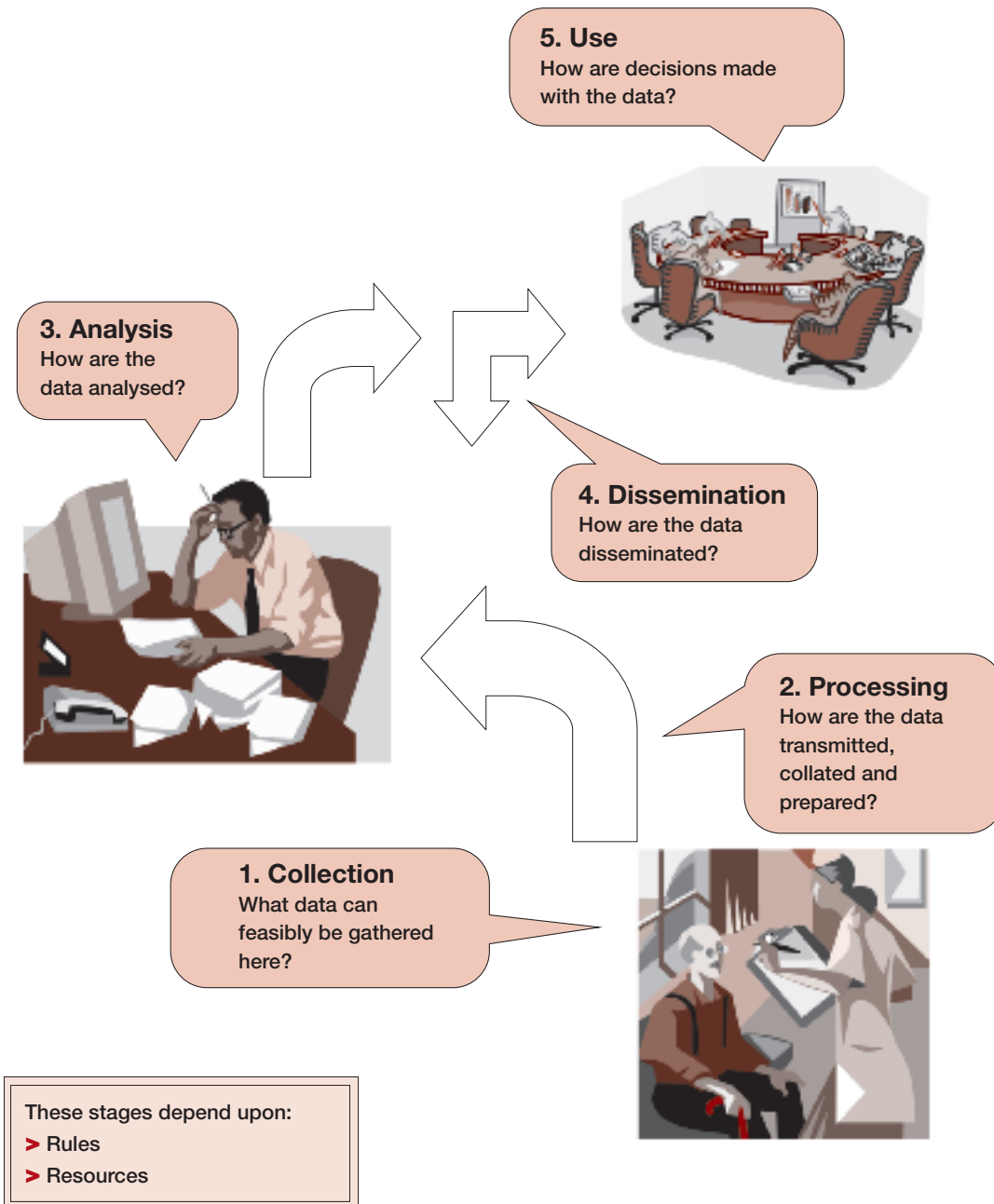
- Resources, such as the staff required to operationalize the system, the software and the hardware.
- Rules, such as the responsibilities of the staff, standardization of data and definitions of indicators.

Figure 1 illustrates the stages that data undergo in an information system. Beginning at the point of collection, data are processed, analysed, disseminated and then used. This illustrates the circular movement of information, since at least some of it ultimately needs to return to the point of collection, albeit in a processed form. The figure also illustrates the essential interdependence of these stages and the need to plan information systems as a whole. An information system needs to address all the questions in Figure 1 in order to function effectively.

*An MHIS is a system for collecting, processing, analysing, disseminating and using information about a mental health service and the mental health needs of the population.*

*An MHIS involves several stages.*

**Figure 1. Stages of a mental health information system**



### 1.3 From where should information be collected?

Information should be collected from a variety of mental health services. These services need to have systems in place to enable collection of the required information. WHO has developed a model for an optimal mix of mental health services: the WHO pyramid framework (Figure 2). This framework can be used to help organize the place of collection as well as the type of information that needs to be collected.

In this pyramid framework, the most numerous services are self-care management, informal community mental health services and community-based mental health services provided by primary care staff; these are followed by psychiatric services based in general hospitals and formal community mental health services, and, lastly, specialist mental health services. Many of these services will be integrated into general health services. More detailed descriptions of each of these service types are provided in the module: *Organization of Services for Mental Health* (WHO, 2003a).

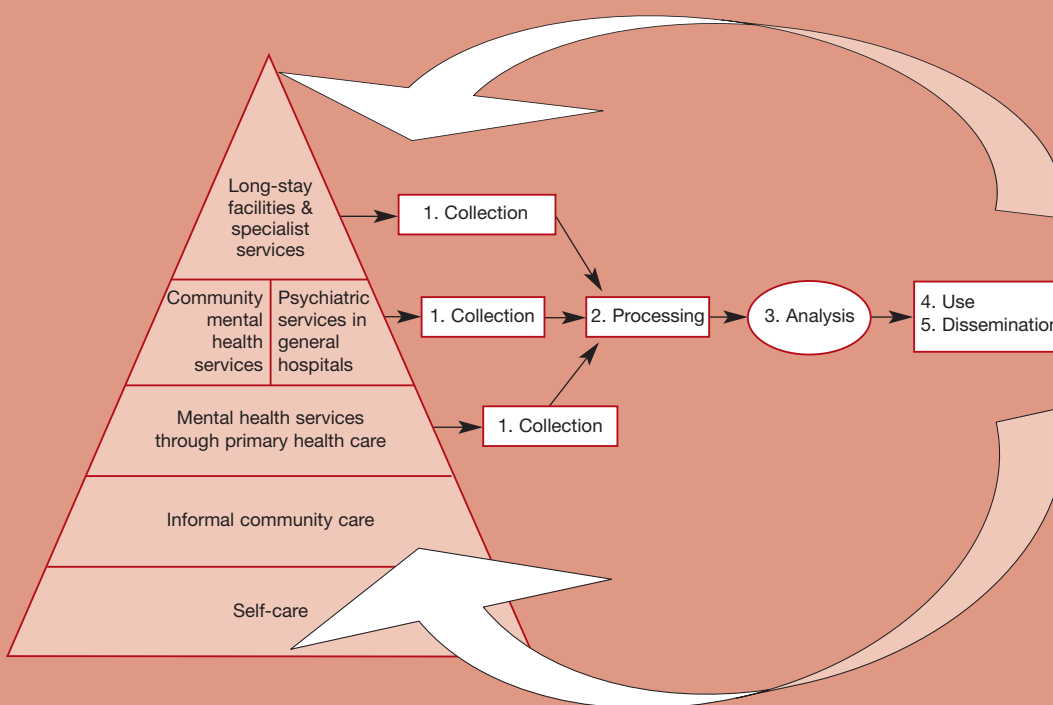
For the purpose of information systems, this module focuses only on primary care, psychiatric services based in general hospitals, formal community mental health services, and specialist mental health services.

Figure 2 illustrates the way in which all service types need to collect information, which is then processed, analysed, used and disseminated. However, it is important to emphasize that not all information needs to be processed to a central level. Some information may be retained in the facility for analysis and use within that facility. This point is discussed further in the section that follows.

*Information should be collected from a variety of mental health services.*

*All service types need to collect information, which is then processed, analysed, used and disseminated.*

**Figure 2. The WHO pyramid framework: MHIS stages and the optimal mix of mental health services**



## 1.4 What types of information should be collected?

MHIS planners need to consider each level of the service organization pyramid when deciding what information is required. Different types of information should be processed to different levels within the MHIS, and it is important to consider the practicalities of how one level relates to another.

To help MHIS planners make these decisions, it is necessary to distinguish between different types of information:

- Episode-level information is required to manage an individual episode of service contact;
- Case-level information is required to care for an individual service user;
- Facility-level information is required to manage the specific service facility (whether the facility is a specialist institution, a mental health ward in a general hospital, a community mental health team, or a primary health care clinic);
- System-level information is required to develop a policy and plan for the mental health system as a whole.

From the above categorization, it can be seen that some case-level and facility-level information may not need to be processed at a central level; it can be retained for analysis and service delivery in the facility concerned. For example, information regarding the diagnoses of specific cases and staff duty rosters can be retained at the facility level for case management, facility management, privacy, confidentiality and other reasons. By contrast, system-level information needs to be processed to a central level, for analysis and use in policy-making and planning. For example, information on the number of people with mental disorders attending all facilities within a region and the number of staff within that region is important system-level information that can be used for service planning.

The MHIS therefore needs to include both service management systems (facility-level and system-level data) and patient record systems (episode-level and case-level data). The first is essentially a strategic management or planning tool. It provides the means for monitoring and improving the mental health system as a whole within broad policy objectives (dealing largely with system-level and facility-level information). The second provides a means of improving day-to-day service provision for individuals through record-keeping for service users (dealing largely with case-level and episode-level information). In this module, the “steps in designing and implementing an MHIS” are intended to cover both service management and patient record systems.

It is important to note that the distinction between levels of information is not rigid; there may be overlap between these categories in certain instances. For example, some facility level information may also be regarded as system-level information, and some episode-level information (related to an individual episode of patient contact with a service) may also be regarded as case-level information. Nevertheless, the distinction between levels of information is useful in order to clarify how information should be processed, analysed and used.

Box 1 provides examples of levels of information, for each service category described in the optimal mix pyramid (Box 1).

*Different types of information should be processed to different levels within the MHIS.*

*Not all information needs to be processed at a central level. Some can be retained for analysis and use in the facility.*

*The MHIS should include both service management systems and patient record systems.*

*There is likely to be some overlap between levels of information.*

**Box 1. Examples of levels of information for each mental health service type.**

Service type	Examples of data	Episode level	Case level	Facility level	System level
<b>Primary care</b>	> Diagnosis of an individual service user	Yes	Yes	No	No
	> Number of individuals diagnosed with a mental disorder who attend services	No	No	Yes	Yes
	> Number of attendances by people diagnosed with mental disorders	No	No	Yes	Yes
	> Intervention used (e.g. medication, counselling)	Yes	Yes	Yes*	No*
	> Length of consultation	Yes	Yes	Yes	Yes
	> Staff duty roster	No	No	Yes	No
	> List of available psychotropic medication	No	No	Yes	Yes
<b>Formal community mental health services (CMHS)</b>	> Diagnosis of an individual service user	Yes	Yes	No	No
	> Number of individuals diagnosed with a mental disorder who attend services	No	No	Yes	Yes
	> Number of attendances	No	No	Yes	Yes
	> Intervention used (e.g. medication, counselling)	Yes	Yes	Yes*	No*
	> Number of people with mental disorders attending services (covering all CMHS)	No	No	No	Yes

Service type	Examples of data	Episode level	Case level	Facility level	System level
<b>Psychiatric services in general hospitals</b>	> Diagnosis of an individual service user	Yes	Yes	No	No
	> Number of individuals admitted who have been diagnosed with a mental disorder	No	No	Yes	Yes
	> Number of admissions	No	No	Yes	Yes
	> Length of admission	Yes	Yes	Yes	Yes
	> Health status at time of discharge	Yes	Yes	Yes	Yes
	> Number of beds	No	No	Yes	Yes
<b>Specialist services</b>	> Diagnosis of an individual service user	Yes	Yes	No	No
	> Number of individuals admitted who have been diagnosed with a mental disorder	No	No	Yes	Yes
	> Number of admissions	No	No	Yes	Yes
	> Number of involuntary admissions	No	No	Yes	Yes
	> Number of physical restraint or seclusion cases	No	No	Yes	Yes
	> Number of referrals to and from other sectors (e.g. courts)	No	No	Yes	Yes

\* There may be a degree of overlap between these information levels in some instances.

## 1.5 Benefits of an MHIS

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There are several benefits of an MHIS. These include its functions as a planning and service delivery tool, and its capacity to improve effectiveness, efficiency and equity in a mental health system (see Box 2 for details).

### Box 2. What are the benefits of an MHIS?

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*An MHIS is a planning and service delivery tool to improve effectiveness, efficiency and equity.*

*As a planning tool:*

- It can offer a way of providing accurate, consistent information about a mental health service.
- It helps improve coherency of planning; rational planning is not possible without accurate information.
- It is an essential tool in policy implementation and evaluation. Without accurate information, policy-makers cannot assess whether policy objectives are being achieved.

*As a service delivery tool:*

- It can assist service providers by recording and monitoring the needs of individual service users.
- It provides a means of reporting the interventions that are used, and can thus be linked to the ongoing improvement of service quality.

*Effectiveness.* By including indicators explicitly determined by the policy framework of the mental health service, the MHIS provides information on whether and to what extent the stated aims and objectives of the service are being met. For example, if a policy objective is to integrate mental health services into primary health care, the MHIS can be used to assess the extent to which this is in fact happening. Similarly, by monitoring the clinical interventions that are being used, service providers can continually assess their effectiveness.

*Efficiency.* By providing the means to assess input, process and outcome components, the MHIS provides some measure of how well resources are being used. Importantly, information can be used to secure appropriate levels of funding for the mental health service.

*Equity.* By explicitly measuring need and coverage, the MHIS addresses a central challenge facing the mental health service: providing equitable care with scarce resources. The MHIS can improve accountability both within the organization as well as to people with mental disorders, their families and advocacy groups.

## 1.6 Common problems with health information systems

Although there are several benefits to information systems, many health information systems are beset with problems. These can be encountered in each of the stages identified in Figure 1.

- > **Collection.** Data collected are often of poor quality. Sometimes, clinicians are not informed as to why they are required to gather data and how it will be used. Poor data collection is often due to overworked health workers and to management's lack of an information policy and accompanying regulations (Robey & Lee, 1990).
- > **Processing.** A large proportion of the data collected goes straight to the national level without being used locally (De Kadt, 1989). Frequently, information systems are designed primarily for senior managers and policy-makers and not for use by the service staff and managers at the recording and reporting level.
- > **Analysis.** Much of the data collected and processed remains unanalysed. If it is analysed, the analysis often consists of simple aggregations that lack denominators or are inaccurate. The aggregation of data at higher levels often prevents data from being sufficiently specific for appropriate local application.
- > **Dissemination.** There is an oversupply of inappropriate data; health service supervisors and peripheral health workers rarely receive feedback on the data reported to higher levels (Robey & Lee, 1990); and often, report findings are not accessible to policy-makers and planners.
- > **Use.** Information may be available but is not used. At the managerial level, training is needed on how to use the information and to generate appropriate and relevant questions (Finau, 1994). There is often a lack of information-sharing and coordination within the health sector (Robey & Lee, 1990) and between sectors.
- > **Resources.** Information systems are often overcentralized, and not enough staff time is devoted to information collection and management. Often, the resources allocated to information systems are insufficient. In some instances, limited resources are spent on inappropriate systems, which could be worse than not using any resources at all (Finau, 1994).
- > **Rules.** Health workers rarely have standardized instructions on how to collect data, and receive little if any training in data collection methods.

In the case of MHIS, particularly in developing countries, those who are involved in the design and maintenance of HIS frequently lack an adequate understanding of mental health. For example, cases are not classified correctly, mental health activities within primary health care are not adequately monitored, and the quality of data varies between service levels (e.g. detailed information available from psychiatric hospitals, but inadequate information available from community mental health services and primary care).

These problems are made worse by changes in the health system as a whole, in terms of both structure and staff turnover. With regard to structure, many health service systems are undergoing considerable reform, reorganization and decentralization, including changes in funding sources and mechanisms. Information systems should therefore be designed to take into account such changes, yet rarely is there a detailed definition of the new functions and responsibilities resulting from systems reform. This results in the information systems seldom serving the new management's requirements.

In relation to mental health staff, if there is a high staff turnover, the new people hired are often unfamiliar with either the way the data are collected or the rationale for data collection. There is a risk that these new people will learn only some of the methods of data collection and coding. This creates systematic errors in the way that data are collected, and these may not be picked up.

*There are several common problems with health information systems.*

*HIS managers frequently lack an adequate understanding of mental health and its information needs.*

*High staff turnover can create problems for the MHIS.*

*“Much of the material remains unprocessed, unanalysed, or if analysed, not written-up, or if written-up, not read, or if read, not used or acted upon” (Chambers, 1983).*

These problems are partly summarized in a variant of “Finagle’s Law”: the information you have is not what you need and the information you need is not what you can get. This arises partly from the top-down approach to designing HIS, which involves little consultation with the local services (Opit, 1987).

Careful planning in the design and implementation of information systems is therefore essential for overcoming these common problems.

*Careful planning is essential for overcoming these common problems*

### **Key points: Introduction**

- An MHIS is a system for collecting, processing, analysing, disseminating and using information about a mental health service and the mental health needs of the population it serves.
- Information should be collected from different mental health services. A model has been developed by WHO for an optimal mix of mental health services that includes self-care management, informal community mental health services, primary health care, psychiatric services based in general hospitals, formal community mental health services, and specialist mental health services.
- There are broadly four levels of information that are relevant to MHIS:
  - Episode-level
  - Case-level
  - Facility-level
  - Systems-level
- Several benefits can be derived from an MHIS.
- There are also several common problems that need to be addressed in the design and implementation of an MHIS.



## 2. Principles of MHIS development

The following principles are based on the experiences of several countries in the development of both general health information systems (HIS) and MHIS.

### **2.1 Start small, but keep the big picture in view**

As a first principle, planners should aim at the progressive development of the MHIS, and not attempt a detailed design of the entire system from the outset. In the 1960s and 1970s, efforts to undertake this complex task frequently ran into difficulties. Instead of designing a large, unwieldy system that cannot be implemented, it is preferable to start small and build on successes and revealed needs (Steve Sapirie, personal communication).

At the same time, the bigger picture of the MHIS needs to be kept in view. This means that the team that designs the MHIS must review the needs and capacities of all the stakeholders having an interest in such a system, carefully considering what they could feasibly contribute and what they might gain from the system (Lee & Dartnall, 1998). In other words, the MHIS design must address the needs of the “top” (policy-makers) as well as the “bottom” (service providers and data gatherers) stakeholders. For example, it is pointless designing an MHIS that measures key policy indicators when the resources (and motivation) are not available at the primary health care level to collect and process the necessary data.

This also means that the information needs of the different mental health service levels should be taken into account. Too often, relatively detailed information is collected from psychiatric hospitals, but very little from mental health activities in primary health care clinics. By collecting and utilizing data from all service levels, planners are better able to gain a holistic view of the service and of the population’s needs. A distinction can be made between reporting systems, research projects and information systems, as explained in Box 3.

*The following principles are based on the experiences of several countries.*

*Start small but keep the big picture in view.*

*The information needs of the different service levels should be considered*

### Box 3. Reporting systems, research projects and information systems

A distinction can be drawn between reporting systems, research projects and information systems (Taintor & Laska, 2002):

- > Reporting systems are not information systems. In *reporting systems*, data flow from bottom to top, from local areas to the central government, and hardly any data return to those who gathered them in the first place. As a result, those who gather the data feel undervalued and exploited, and frequently express their resentment subsequently by returning incomplete forms and poor quality data. Such systems are not sustainable and are therefore of little long-term value to planners or to the service.
- > *Research projects* are seldom able to become information systems because they are usually stand-alone projects that focus on a particular issue (e.g. epidemiology). Such information is often too detailed or specific to be used in an information system. Data are gathered as a special event, beyond the routine job description of those who gather the data. Moreover, the data normally focus on one particular point in time, and researchers are usually academics who may have a different agenda from that of service planners and providers.
- > *Information systems*, by contrast, are sustainable methods of gathering, analysing, disseminating and using information that are built into the workings of a mental health service. They are designed and implemented by those who continue to participate in the mental health service, its planning, management, delivery and evaluation.

## 2.2 Use indicators

A second principle of an MHIS is the use of indicators. Indicators are measures which (i) summarize information relevant to a particular phenomenon; (ii) can be used to indicate or show a given situation; and (iii) can therefore be used to measure change (Green, 1999). In the context of mental health care, indicators are measures that summarize information relevant to the mental health service and the population it serves. They are an important means of measuring change in a system and an essential tool in the MHIS. When repeatedly measured, indicators can provide useful information about service quality (see the module, *Quality Improvement for Mental Health WHO, 2003b*).

An important distinction needs to be made between indicators and raw data (or data elements). What distinguishes indicators from raw data is that indicators are aggregates of the minimum data that have a *denominator*. For example, an indicator of the admission rate to inpatient facilities requires raw data on (i) the number of admissions within a specified time frame (numerator), and (ii) the population of the catchment area being served (denominator).

Both indicators and minimal data are of value for information systems. At a case level, data frequently do not need to be converted into indicators (such as detailed case-level and transaction data). At a system level, data need to be converted into indicators for overall service planning and policy evaluation. Thus an MHIS collects data that may be converted into indicators, or that may be used for routine clinical practice and never converted into indicators.

Indicators are an essential means of summarizing large volumes of information and measuring change in a system over time. They are also a useful means of operationalizing specific policy objectives. However, indicators must be adapted to the needs and capacities of those who will collect and utilize the data. For example, much of the data in an MHIS may need to remain as detailed case-level and transaction data, which must be managed at the service delivery level through efficiently maintained databases.

*Indicators are measures that summarize information relevant to the mental health service and the population it serves.*

*What distinguishes indicators from raw data is that indicators are aggregates of the minimum data that have a denominator.*

*Indicators are an essential means of summarizing large volumes of information and of measuring change in a system over time.*

Once indicators are identified, information systems can be designed around the indicators, based on feasibility and the available resources. This aspect is discussed in more detail in the section below on needs assessment (see Annex 1 for the WHO framework for mental health indicators for countries).

Indicators can be used to measure various aspects of the mental health system:

- > **Needs** of the population for mental health care (e.g. percentage of the population that belongs to vulnerable groups).
- > **Inputs** – the resources that are put into the mental health care system (Thorncroft & Tansella, 1999), such as human resources, finances and medication (e.g. number of mental health professionals per 100 000 population, budgets for mental health promotion programmes as a percentage of general health promotion budgets);
- > **Processes** – activities of the service, including the way in which care is delivered (e.g. annual number of admissions to mental hospitals per 100 000 population, availability of promotion activities on mental health in primary care clinics); and
- > **Outcomes** – the effect of the service on the mental health of the population being served (e.g. annual suicide rate, reduction of symptoms, level of disability, quality of life).

Traditionally, planners tend to focus on input and process indicators, both in evaluating services and in data collection; they often find it difficult to build in outcome indicators. Part of the difficulty is that interventions planned by mental health services do not always have a direct impact on outcomes. For example, the suicide rate in a particular area or country may be influenced more by social factors or factors beyond the control of the health services. Moreover, information on outcome indicators (other than the suicide rate) may be difficult to obtain, particularly in settings with low resources.

Nevertheless, outcome indicators are essential, and can be used for planning interventions both at a broad (intersectoral) and focused (service) level. They provide an invaluable means of evaluating the impact of interventions: from mental health promotion, to preventive and treatment interventions such as medication and psychotherapy. Without these measures, service planners and service providers have no way of assessing whether their efforts are having a beneficial effect on the population being served.

Concerns have been expressed regarding the bias inherent in outcomes reporting by service providers (Bilsker & Goldner, 2002). However, these concerns have been countered by an emphasis on using a range of sources of information when conducting outcome assessments, and by pointing out the many advantages of routine outcome measurement that outweigh the potential disadvantages of observer bias (Callaly, Coombs & Berk, 2003; Trauer, 2003). As a general rule, outcome indicators for mental health need to be built from multiple data sources, and they require a combination of data on service utilization, consumer surveys and clinician-rated outcomes.

### **2.3 Establish a minimum data set**

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A third basic principle of any MHIS is that it should gather the minimum required information. A minimum data set means that only the least, most essential information is gathered and used. This principle underscores *the goal of the MHIS, which is not merely to gather data, but also to enable decision-making*. In a context of limited resources, when frontline staff do not have the time to gather detailed information, a minimum data set is necessary. “Start small, expand later” is implied in this principle; if an MHIS is functioning well, and the capacity exists for expansion, then this can be undertaken when the opportunity arises. The design of an MHIS should therefore be founded on identifying the minimum data set for the

*Indicators can be used to measure various aspects of a mental health system:*

- > *needs*
- > *inputs*
- > *processes*
- > *outcomes*

*Outcome indicators are of particular importance.*

*An MHIS should gather the minimum required information.*

system (Bank, Goodman & Wanderling, 1989; Glover, 2000; Leginski et al., 1989; Lee & Dartnall, 1998).

As stated earlier, the distinction between indicators and the minimum data set is that indicators are aggregates of the minimum data that have an identified denominator. For this reason, indicators need to determine the data set and not the other way round (bearing in mind, of course, that indicators need to be informed by what data can feasibly be gathered). In other words, the objectives of the information system should determine what data are gathered, and data should not be gathered for data's sake.

Annex 2 provides an example of a minimum data set used in a specific country.

## **2.4 Make the MHIS user-friendly**

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A fourth essential principle of MHIS is that it should be user-friendly. From the end-users who gather and use data during the clinical encounter, to those involved in processing, analysing and using the data to make planning and policy decisions, the purpose for which information is being gathered and used should be clear, consistent and accessible. Staff who understand the purpose of the data they are gathering are far more likely to feel motivated about completing their tasks, and doing so accurately. In addition to understanding the purpose of the MHIS (the “why?” question), staff also need to understand clearly the task required of them, and be equipped to complete it (the “how?” question). This includes practical aspects, such as details of how to fill in a form, how to check data quality, and how to conduct routine data analysis. In short, the data being collected should have “face validity” (see definitions) for those who are collecting it. Where these tasks become complex, detailed descriptions of procedures and a certain amount of in-service training and supervision are required. This is an important management function of the health system.

Furthermore, user-friendly systems imply that the “users” should be rewarded for their information contributions by providing them with the information they need. The most user-friendly systems make reports available to local service providers. Computerized systems should enable the generation of local reports for this purpose. Moreover, the most user-friendly systems provide feedback to those contributing the data, which can be useful in their own work, for getting their jobs done. A powerful guarantee of good quality data is the use of MHIS data for multiple purposes, such as better care, administration, billing for services and service planning. These data may be subject to inspection and audit from several sources.

## **2.5 Clarify the relationship of the MHIS with information systems in the general health and other sectors**

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### **(a) Relationship with the general HIS**

For the MHIS to be used in general health planning, its relationship with the general HIS should be clarified. Thorough consultation with planners and administrators involved in the design and implementation of the general HIS is important.

A range of scenarios exists for the relationship between MHIS and HIS. There could be full integration, in which mental health information is gathered as part of all general health information; or partial integration, whereby mental health information is gathered separately but processed to a central HIS centre for analysis. Or there might be complete separation whereby mental health information is collected, processed, analysed, disseminated and used in an entirely separate system to that of the HIS.

*Information systems should be user-friendly.*

*Data that is collected should have face validity for those who are collecting it.*

*The relationship between MHIS and the general HIS needs to be clarified.*

*A range of scenarios exists: full integration, partial integration or complete separation.*

Greater integration might be preferable where there is a greater degree of service integration. For example, in primary health care services, an MHIS that is integrated with HIS is likely to function well because many of the functions of the mental health service will be integrated into the general health service. By contrast, specialist mental health facilities may do well to have a relatively separate MHIS, at least as far as case-level and facility-level data are concerned.

As an example, in the design of the MHIS in Gauteng province, South Africa, thorough consultations with staff from the provincial and regional HIS were held to identify what data could feasibly be gathered, who had access to that information, and what aspects were used for specialist (mental health) and general health planning (Centre for Health Policy, 1998).

Box 4 lists the benefits of including MHIS in HIS.

#### **Box 4. The benefits of including MHIS in general HIS**

- > Planning for the health needs of the community can proceed in a holistic manner through the collection of data relevant to both physical and mental health.
- > Mental health information systems can make use of the existing HIS infrastructure for the collection, processing, analysis and use of data. This includes the sharing of the technical infrastructure (software and hardware) and staff time.
- > Health information system managers can benefit from the specialist knowledge provided by mental health planners and clinicians for the collection and use of data specific to mental health.
- > Seeking compatibility of information systems is consistent with the principle of integration of mental health services into general health care, advocated by WHO.

While the compatibility of MHIS with HIS is desirable (WHO, 1990), it is not a simple undertaking; it poses major challenges for information systems. Some of the questions that need to be addressed are:

- > To what extent can the information needed by mental health planners be included in the general HIS?
- > Are general health planners willing to include mental health data in their minimum data sets?
- > Does the MHIS have specific needs that cannot be met by the general HIS?

These questions need to be taken into consideration in the design and implementation of the MHIS, and they will be influenced by local conditions. For example, in Zambia, the challenge has been to arrive at a minimum data set for mental health indicators to be included in the general HIS. Previously, information on mental disorders had been collected based on the International Classification of Diseases (ICD-10) criteria which have 18 components (diagnoses). However, the present Zambian health management information system's disease aggregation form cannot accommodate the various mental disorders. It has only one category of "mental disorders", which does not specify the nature of the disorder because of limited space. This is in spite of mental health planners' attempts to reduce mental disorders to 13 indicators at primary level and 12 at secondary and tertiary levels.

In consultations with the HIS staff, mental health planners have been advised to create a parallel system of collecting, processing and analysing mental health data in a similar manner to other conditions such as tuberculosis. However, a parallel MHIS runs the risk of further isolating mental health issues (John Mayeya, personal communication).

*Greater integration of information systems might be preferable where there is a greater degree of service integration.*

*There are several major challenges in making the MHIS compatible with the HIS*

Suggestions for assessing the extent of mental health service integration into general health care, and the implications for information systems, will be discussed in more detail below.

### **(b) Relationship with the information systems of other sectors**

A second important area relates to sectors other than the health sector. While there is a growing awareness of the need to approach mental health problems intersectorally, little has been done to adjust information systems accordingly (De Kadt, 1989). An intersectoral relationship is particularly important for mental health, which spans health, social services, education, criminal justice, labour and other sectors, as well as NGOs. For example, in many countries, attempts to reduce the size of psychiatric institutions has led to a large number of people with mental disorders being placed in prisons. Information on the numbers and characteristics of people with mental disorders in the criminal justice system therefore needs to be carefully monitored to enable joint planning and collaboration where necessary.

Many countries collect and make data available by census tract. These data often include variables that help in determining how the mental health service users from a given tract may be representative or not compared to the general population living there. The data might include the number of welfare recipients, income levels and levels of overcrowding in housing. These data are available online in the United States, for example.

Another example of the usefulness of intersectoral collaboration for information systems is the use of geographical mapping. In Papua New Guinea, maps were drawn using the national census as a common base. This enabled an indication of the distribution of facilities, health conditions, access to facilities and other details that were covered by the common coding systems of the Department of Health. Maps are a convenient way of summarizing information, and are useful for enabling decision-making, particularly when decision-makers do not have the time to peruse lengthy documents or complex statistical data (Cibulskis & Hiawalyer, 2002).

For an example of a country's use of geoinformatics in the area of public health, see New Zealand's public health information website at: <http://www.moh.govt.nz/phi>. For a more detailed discussion on the use of geographical information systems for HIS in general, see Sauerborn & Karam (2000).

Such intersectoral information systems provide a powerful tool for intersectoral planning around issues such as poverty reduction, which have important implications for the mental health of populations. It should be noted that it is not easy to automate the transfer of data that reflect risk or causative factors related to mental health problems and interventions, and care must be taken in doing so.

## **2.6 Consult with all stakeholders**

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Because information systems require the participation of many stakeholders, consultation with these stakeholders is essential in the design and implementation of the information system.

A variety of stakeholders have an interest in MHIS. Each stakeholder group has different information needs. For example, service users may want information about which treatments are the most effective so that they can choose the treatment they feel would best suit them; service planners require information about cost-effectiveness of treatments and the number of people who will require treatment, so that they can choose which treatment they should provide. An MHIS therefore needs to address these varying needs in a practical and feasible manner.

*The MHIS should reflect the need for an intersectoral approach to mental health care.*

*Consultation with a range of stakeholders is essential in the design and implementation of the information system.*

Consultation with all stakeholders is essential not only because of the ethical imperative to consult with all those involved; it is also important because it could result in useful contributions from the stakeholders about the way the information system should be designed and what information should be gathered. In addition, people who have been consulted in the design and development of an information system are more likely to understand the system and participate in its implementation. This includes both service providers and service consumers. To ensure that the needs of mental health service consumers are met as effectively and efficiently as possible, clinicians and service managers require an MHIS that can be readily linked into quality improvement feedback loops and day-to-day service provision. Depending on the scale of the MHIS, stakeholders at local, regional and national levels may need to be consulted.

The involvement of the mental health team in the design and implementation of the MHIS is essential. Such a team will be in possession of important information, such as what data can feasibly be gathered during a clinical encounter, the ethical and therapeutic boundaries of data gathering, and the planning uses of mental health data. Furthermore, the team's participation in the design and conceptualization of the system is more likely to lead to its active participation in its implementation and evaluation (Centre for Health Policy, 1998).

Through the process of consultation it will be important to balance the varying needs of the stakeholders involved in mental health. All data sets and forms are compromises. While it is tempting to think of a "complete minimum data set", this may not be feasible in many instances. Compromise and give-and-take are accepted more easily if they are understood and are part of the process from the start. For example, the needs of clinicians to spend effective time in the direct care of people with mental disorders will limit the volume of information that they can be expected to gather on a routine basis. Whatever data set is selected, performance dimensions and their associated indicators need to be easily understood by all the stakeholders and should serve as triggers for action.

Table 1 summarizes the different stakeholders and their information needs.

*Consultation could result in useful contributions from stakeholders about the way the information system should be designed and implemented.*

*The involvement of the mental health team in MHIS design and implementation is essential.*

*It will be important to balance the varying needs of the stakeholders involved in mental health.*

**Table 1. Mental health stakeholders and their information needs**

<b>Stakeholders</b>	<b>Information needs</b>
<b>People with mental disorders</b>	<ul style="list-style-type: none"><li>➤ Information on good quality, accessible, affordable care</li><li>➤ Privacy</li><li>➤ Confidentiality</li><li>➤ Outcomes</li></ul>
<b>Families of people with mental disorders</b>	<ul style="list-style-type: none"><li>➤ Information on appropriate care for family member</li><li>➤ Information on course and likely outcome of family member's condition</li><li>➤ Information on available support</li><li>➤ Outcomes</li></ul>
<b>Clinicians</b>	<ul style="list-style-type: none"><li>➤ Case records</li><li>➤ Treatment guidelines</li><li>➤ Referral routes</li><li>➤ Available resources in adjacent services</li><li>➤ Outcomes</li></ul>
<b>Planners, managers and policy-makers</b>	<ul style="list-style-type: none"><li>➤ Current mental health policy and plans</li><li>➤ Needs of the population for services</li><li>➤ Resources (inputs) available to deliver the services</li><li>➤ Process of care delivery</li><li>➤ Outcomes</li></ul>
<b>NGOs</b>	<ul style="list-style-type: none"><li>➤ Any of the above, depending on their focus</li><li>➤ Areas of potential overlap or collaboration with the public sector</li><li>➤ Current mental health policy and plans</li></ul>

## 2.7 Link MHIS development to wider service development

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The development of an MHIS is most effectively undertaken in the context of wider development and reform of the mental health service. This offers two major advantages. First, the design of the MHIS is built on specific service and management functions. The best way to improve information systems and their use is to focus on improving the management system and processes in which the information is to be used.

Secondly, in the context of wider service changes, MHIS can draw on the political momentum and support garnered for wider service development. Senior management support for MHIS development is crucial to its success (see Needs Assessment, Task 1, below). An example is the development of the MHIS in Gauteng province, South Africa, which took place in the context of wider service reforms in the post-apartheid era (see Needs Assessment, Task 2, below).

## 2.8 Consider routine and non-routine data

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Although information systems are “built into” the mental health service, this does not imply that they always need to gather routine data. Both routine and non-routine data are valuable for mental health service planning and delivery.

Routine data refer to data that are gathered on a regular basis and used in routine service planning. Examples of routinely collected service data include reporting from the different levels of health facilities (primary, secondary, tertiary), health programmes (e.g. psychosocial rehabilitation programmes) and administrative systems (including drugs and logistics systems).

Non-routine data are gathered on an irregular basis and are often used to focus on a particular issue that may be of concern to planners, providers or service users. Examples of non-routine data include one-off evaluations, research studies, audits, surveys, sentinel sites (where information is gathered in more detail than that collected routinely for the established MHIS) and rapid assessments. These data sources provide the planner with alternative perspectives, and can assist in the achievement of specific objectives not normally attainable within the established MHIS. Such data sources may require additional resources, including specific funding, and strong leadership in their development and implementation. See module: *Quality Improvement for Mental Health*, for a more detailed discussion of audits.

In Victoria, Australia, mental health services are required to collect information routinely about service activity. The routine collection includes such information as which patients are seen, by whom and for what length of time. However, the system also provides for three codes that can be defined locally (and are easily changed). For example, a mental health service might decide to record the housing status of patients or their scores on psychological tests. The routine recording system thus has some flexibility to incorporate non-routine data collection.

In countries with limited resources, and where routine data are not available, non-routine data collection may be a feasible alternative to an information system based on routine data collection. This might be an intermediate measure where no information system currently exists. It may then provide the foundation for an incremental development of a basic routine information system. (See Annex 3 for an example of the use of non-routine data in the planning of mental health services in South Africa.)

Some of the distinctions between routine and non-routine data are presented in Table 2.

*MHIS development is most effectively undertaken as part of wider mental health service development and reform.*

*Routine data refer to data that are gathered on a regular basis and used in routine service planning.*

*Non-routine data are gathered on an irregular basis and are often used to focus on a particular issue.*

*Both routine and non-routine data are of value in the MHIS.*

**Table 2. Distinctions between routine and non-routine data**

Routine data	Non-routine data
<ul style="list-style-type: none"> <li>&gt; Regularly gathered, analysed, disseminated and used.</li> <li>&gt; Data gathering is part of the job description of clinical service providers and managers.</li> <li>&gt; Routinely used for the planning of services (e.g. for annual service plans and budgets).</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Not regularly gathered.</li> <li>&gt; Focuses on a specific issue of concern (e.g. evaluation of a deinstitutionalization project).</li> <li>&gt; May require extra funding or the allocation of extra staff time for gathering, analysis and dissemination.</li> <li>&gt; May inform specific planning or policy initiatives.</li> </ul>

**2.9 Consider how epidemiological data should be included in the MHIS**

A crucial question that arises when planning an MHIS is: what is the role of epidemiological data, and how should it be included in an MHIS? Epidemiological data are difficult to use in an MHIS for several reasons. First of all, epidemiological data regarding rates of mental disorder in communities have a poor correlation with both the utilization of mental health services and the need for treatment (many people with mental disorders do not use services, and some people without disorders do). Secondly, psychiatric epidemiological studies are complex, resource-intensive undertakings that can absorb many of the resources more urgently needed to plan and develop services and information systems, particularly in low-income countries. Thirdly, the incidence of some disorders (e.g. schizophrenia) is sometimes not sensitive to change in the way that infectious diseases might be, although they are treatable.

Many people in the mental health field have grappled with this methodological problem for some time (Andrews & Henderson, 2000). There is a need to develop economical, population-based needs assessment methodologies to allow service planners to monitor the requirements for care.

In other modules of the WHO Guidance Package (e.g. *Planning and Budgeting to Deliver Services for Mental Health; Human Resources and Training for Mental Health*) this problem has been addressed by emphasizing the use of epidemiological data in conjunction with other data on service utilization, and with qualitative data, for example, from key informants. It is also possible to adapt epidemiological data from other settings to local conditions. A methodology for this is presented in the module, *Planning and Budgeting to Deliver Services for Mental Health*.

As a general guide, for planning purposes epidemiological data should be used in conjunction with other data in information systems. In the absence of epidemiological data, alternative methodologies may need to be employed (e.g. rapid appraisals, sentinel surveys and obtaining epidemiological information from other, similar countries), instead of using valuable and limited resources on expensive, complex and time-consuming epidemiological surveys.

There may be situations where epidemiological surveillance is a necessary component of an MHIS, but in most situations the purposes for which an MHIS is developed will not be compromised by the absence of epidemiological data. What is more urgently needed in most developing countries is the development of accurate information systems that facilitate the monitoring of service delivery and its impact.

*Epidemiological data are difficult to use in an MHIS for several reasons.*

*Other modules of this Guidance Package have emphasized the use of epidemiological data in conjunction with other service data.*

*Limited resources should not be spent on expensive, complex and time-consuming epidemiological surveys.*

*What is more urgently needed in most developing countries is the development of accurate information systems that facilitate the monitoring of service delivery and its impact.*

## **2.10 Ensure privacy, confidentiality, access to information and consent**

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The foundation stone of any MHIS is ensuring the privacy of those people whose personal information is required for service delivery and planning. The need for confidentiality is particularly important when information becomes shared. Ownership of the information may be regarded as being temporarily transferred in exchange for a particular service (Smith, 2000). During this exchange, people with mental disorders and their families trust that the mental health service will safeguard their private information.

It is therefore important for the MHIS to take all measures necessary to ensure that private information is shared only with those professional staff who are required to have access to that information, and that personal identifiers are removed from the information if it is to be used further for the purposes of service planning. Clear systems and policies should be in place to ensure this, and these should be considered at the outset, when the MHIS is being designed. This includes consideration of who holds the data, what identifying information is used, and who has access to the data in its identified and de-identified form. Furthermore, every effort should be taken to ensure that records are kept in a secure environment and protected against theft, loss, unauthorized access, modification or other inappropriate use (Centre for Health Policy, 1998).

Implicit in service users' right to privacy and confidentiality is their right to know what information is being collected about them, and they should have access to that information. If personal information is to be removed from a confidential folder for the purpose of service planning, the consent of the service user must be obtained.

Owing to the risk of stigma, it is particularly important that private information regarding a person with a mental disorder be managed with confidentiality within the general HIS. For example, general health administrative staff who manage data on people with mental disorders need to undergo training to understand the importance of maintaining confidentiality within the local community.

See [www.nzhis.govt.nz/documentation/mhinc/AK983340.pdf](http://www.nzhis.govt.nz/documentation/mhinc/AK983340.pdf) for a full discussion of these ethical issues as addressed in the New Zealand National Mental Health Information Project. Also, the New Zealand General Health Information Privacy Code is available at: [www.privacy.org.nz/comply/HIPCWWW.pdf](http://www.privacy.org.nz/comply/HIPCWWW.pdf).

## **2.11 Address specific mental health information needs**

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Medico-legal procedures for the admission of people with mental disorders may require the collection of specific information, depending on existing legislation in a country. The MHIS should therefore be designed to include these special information needs, such as:

- > specific confidentiality needs
- > involuntary admission data
- > documentation on physical restraint or seclusion
- > liaison with other sectors, particularly the courts.

Specific data capturing and processing procedures will be required for this purpose.

*The foundation stone of any MHIS is ensuring privacy and confidentiality.*

*Service users have the right to know what information is being collected about them, and they should have access to that information.*

*Mental health services may have specific information needs that should be addressed.*

### **Key points: Principles of MHIS**

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The following principles are essential for the development of MHIS:

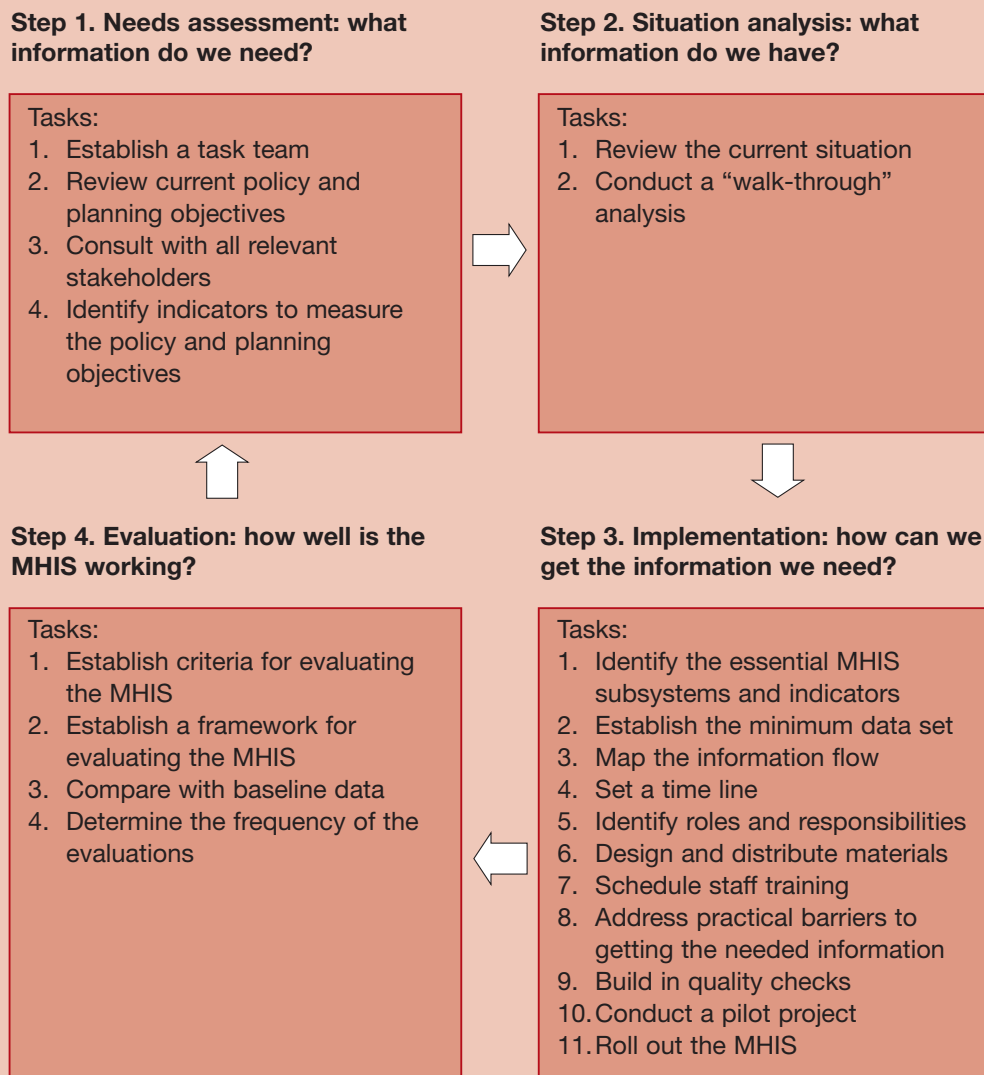
- Start small, but keep the big picture in view
- Use indicators
- Establish a minimum data set
- Make the MHIS user-friendly
- Clarify the relationship of the MHIS with information systems in the general health and other sectors
- Consult with all stakeholders
- Link MHIS development to wider service development
- Consider routine and non-routine data
- Consider how epidemiological data should be included in the MHIS
- Ensure privacy, confidentiality, access to information and consent
- Address specific mental health information needs

### 3. Steps in designing and implementing a mental health information system

This module takes planners through a step-by-step process that will enable them to assess information needs, analyse current information systems, implement the planned information systems and evaluate them. The step-by-step process addresses four questions (see Figure 3):

- What information do we need? (Needs assessment)
- What information do we have? (Situation analysis)
- How can we get the information we need? (Implementation)
- How well are the information systems working? (Evaluation)

**Figure 3. Steps in the development of a mental health information system**



The planning steps in this module take the form of a cycle. The cycle implies that the final step of evaluating the MHIS leads naturally to an identification of new information needs for the MHIS. It is thus an iterative process that requires ongoing reflection and review (Lee & Dartnall, 1998). For example, the criteria for the evaluation (Step 4) need to be considered during the early stages of needs assessment (Step 1) and situation analysis (Step 2). This enables ongoing evaluation of the MHIS to be included in its design and implementation.

*The planning steps in this module take the form of a cycle.*

This planning cycle should not be rigidly interpreted; rather, it should be adapted to countries' specific needs. For example, Steps 1 and 2 are not necessarily sequential; a country may choose to conduct a situation analysis before the needs assessment.

*This planning cycle must be adapted to countries' specific needs.*

## **Step 1. Needs assessment: what information do we need?**

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### **Task 1: Establish a task team**

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The first task in a needs assessment is to establish a team that will take responsibility for designing and implementing the MHIS. Because of the organizational, managerial and technical complexities involved in information system reform, a multidisciplinary task team is required (Lippeveld, 2000a). The task team should include a senior manager, a representative of frontline clinical staff, a representative of medical records staff, a member of the HIS unit, a skilled trainer, and, ideally, service users and carers. It is important for a member of the general HIS unit to be involved in the development of the MHIS, as the system will need to be developed in the context of the general HIS (see earlier discussion on Principles of MHIS). Individuals with expertise in MHIS and computerization may at times be drawn from outside the local service.

*The first task is to establish a team.*

As the development or reform of an MHIS is inherently a process of change, and likely to encounter opposition, it is important to have a senior manager as its proponent. In describing the development of a national health information system, Foltz (1993) points out, "Leadership frequently has been cited as a factor in technology transfer. In the case of Chad's system, it was crucial. The Director-General, who strongly favored an integrated, comprehensive information system, was able to mobilise staff and negotiate a consensus." If a supportive senior manager is not available, possible candidates may need to be identified and lobbied.

*Support from senior management is essential.*

Within the task team a subgroup would need to take on leadership in driving the process, gathering information between meetings and ensuring that the reform remains on track.

The membership of the task team reflects the need for the system to be designed in response to the requirements of the local setting. Finau (1994) warns of the risk of seeking external expertise: "The development of health information systems has largely depended on expatriate consultants, who do not stay long enough to understand the health system and environment to completely follow up the system." It is therefore vital that the task team be selected with a view to assuring the long-term sustainability of the information system. This includes local design and, where necessary, local computer programming, for the sake of national self-reliance and the ability to change and maintain the system.

*The team membership needs to be sustainable in the long term.*

### **Box 5. Task 1 example: Establish a task team**

Planners in a provincial health department decided to review the existing MHIS and design a more appropriate system. The health department served a population of 5 million, 60% of whom lived in urban or periurban areas. As a starting point, a task team was appointed, comprising an MHIS coordinator (a mental health service manager), a psychiatric nurse responsible for service provision and supervision of general nurses in primary care clinics, a member of the existing health department information system, and a researcher/trainer from the local university's department of psychiatry. The director of the Department of Mental Health and Substance Dependence in the province gave the initiative her full support, and undertook to act as an advocate at senior management level when policy decisions were required.

### **Task 2: Review current policy and planning objectives**

Once established, the first task of the team is to conduct a review of mental health policy and planning objectives. This task is essential because clearly conceptualized information systems that are consistent with policy are more likely to produce the required minimal information, with the limited resources available. An information system that is not informed by policy and plans is likely to gather and process information which is at best inconsistent with the policy, and at worst an obstacle to its implementation.

Therefore, the questions that the task team needs to answer are: What are the current policy and planning targets and what information is needed to assess whether those targets are being achieved?

As an example, most evidence-based policies recommend the development of community-based mental health services, the downscaling of psychiatric institutions, and the integration of mental health into general health care at the primary level. For such a policy, an information system would need to be designed that is capable of monitoring the various aspects of the system (the mental health needs of the population to be served; community-based mental health services; psychiatric institutions; primary and secondary level care; and the outcomes of the services on the mental health of the population) in order to assess whether the policy objectives are being achieved. (More guidance on mental health policy development is provided in the module, Mental Health Policy, Plans and Programmes - updated version, available at: [www.who.int/mental\\_health/resources/en/policy\\_plans.PDF](http://www.who.int/mental_health/resources/en/policy_plans.PDF)).

When identifying the policy and planning areas to be addressed by the MHIS, the overall framework of the mental health services also needs to be borne in mind. A focus on mental health services is essential, since the purpose of the MHIS is not merely to collect and process data, but also to improve the services and, ultimately, to improve the mental health of the population. The WHO optimal mix of services pyramid, described in the Introduction to this module, provides a useful framework for understanding the relationship between a variety of service types.

To summarize, this task requires the development of an overall vision for the information system: what is the MHIS setting out to achieve, and what policy and planning objectives need to be measured? The example in Box 6 below is taken from the South African mental health services, to illustrate how the information system can be designed on the basis of existing policy objectives.

*The information system should be informed by current policy and planning objectives.*

*The overall mental health service framework also needs to be borne in mind.*

*This task requires the development of an overall vision for the MHIS.*

### **Box 6. Task 2 example: Designing mental health information systems on the basis of existing policy**

In 1997, the new South African mental health policy was published, which stated: “a comprehensive and community-based mental health service should be planned and coordinated at the national, provincial, district and community levels, and integrated with other health services.” (Department of Health, 1997). The Mental Health Directorate in Gauteng province recognized the inadequacy of the current information systems in the province for monitoring the implementation of this policy. Researchers at the Centre for Health Policy, University of the Witwatersrand, were commissioned to identify mental health information needs at all levels of the health system. Over a one-year period, the researchers interviewed stakeholders in the general health information systems, community mental health teams, primary care clinics, district general hospitals, and specialist psychiatric hospitals. The subsequently designed system set out to provide end-users and managers alike with quality routine information on activities occurring within the community and in the hospital mental health services. The aim of this information system was to: (i) measure aspects of the effectiveness and efficiency of the mental health programme; (ii) measure components of the input, process and output of the mental health programme; and (iii) assist in decision-making with regard to planning and policy within the mental health service (Lee & Dartnall, 1998).

### **Task 3: Consult with all relevant stakeholders**

Having reviewed existing policy and plans, the task team needs to undertake a consultation process with all stakeholders. This should take place not just after policies are reviewed, or before the next task, when indicators are identified. Rather, as stated in the introduction, consultation should be an essential part of the entire process of designing, implementing and evaluating an MHIS. Most governments recognize that an investment of this scale needs to serve a number of purposes and users, and that, therefore, thorough consultation is worth the time and the resources invested.

Some of the questions to stakeholders could include the following:

- > Decision-makers: What are their information needs and how will they use the information?
- > Service providers: What are their information needs and what information can they feasibly provide? What experiences have they had with information systems? How will they benefit from the information system? What routine case-level and transaction data do they need in order to manage their work?
- > Data capture and analysis staff: What capturing and analysis skills do they have, and what are their training needs? What difficulties have they encountered in the past?
- > Service users and advocacy groups: What information is acceptable, and what contravenes rights to confidentiality and privacy?

The following examples from Cameroon and Chad (Box 7) provide an indication of the potential complexity and yet usefulness of this consultation process.

*Consultation with a wide range of stakeholders is essential.*

## **Box 7. Task 3 examples: Consultations in the development of health information systems**

### **1. Definition and selection of national indicators: a participatory approach in Cameroon**

“In 1991, the Ministry of Health of Cameroon decided to completely overhaul its health information system after an assessment revealed major deficiencies in the information system in place. The Ministry wanted this exercise to be as participatory as possible. Potential users (health units, district, provincial, national level and community representatives) and other resource persons were selected, including representatives of the private sector, other ministries (social affairs, finance and planning) and donor agencies. The methodology adopted was to list all the functions and activities at every level of the health system, and then to define information needs and indicators. Reflecting the fact that Cameroon’s priorities were managerial, rather than clinical or epidemiological, the system was called the health management information system (HMIS).

After debating for 2 years during workshops and ‘long’ meetings, a list of 255 indicators was prepared, weaknesses in the information system were identified and solutions for reforming the system were developed and tested. Most participants in the indicator selection process realised that the list needed to be drastically reduced. Programme directors were very hard to convince when it came to reducing the number of indicators related to their programmes. Epidemiologists were even less flexible and were not ready to admit that some indicators were intellectually captivating but operationally difficult to measure. At times the debates became quite emotional.

Objective selection criteria with measurement scales were defined in order to rank the indicators, such as validity of the indicator, difficulty and cost in collecting the data, and importance of the decision. Quite often people’s opinions diverged on the rating. After one more year, the rank list of indicators was available. The ministry decided then, quite arbitrarily, that the HMIS would include the first 50 indicators appearing on the new list. The other indicators were kept ‘on standby’ until a need for their use arose.

Although this participatory process was somewhat inefficient, it was nonetheless successful in engaging all of the actors involved. Through the many months of discussion and debate, the enthusiasm and emotions of many of the participants were galvanized. As a result, health professionals from the health centre level up to the central ministry felt that they had contributed to defining the national indicators.”

Source: (Bodart & Shrestha, 2000).

### **2. Importance of building consensus in the development of health information systems in Chad**

“The primary environmental component has been the use of a consensual process that involved both collectors and users of data in the information system design. Collectors could be reassured that what they were collecting had some purpose for others (and for themselves); users were forced to scrutinise what data they needed and exactly how they would use these data to plan/and or manage. By having to forge compromises and by having to sit at the table opposite their competitors for data, both users and collectors became aware of the complexity of the issues involved and that playing a zero-sum game with their colleagues in the Ministry would not, in the long run, provide them with what they needed. The consensual approach was also assisted by the recognition that resources in Chad were so extremely limited that not much would be available for any one programme or directorate. As the participants became aware that the system would be tailored (as far as possible) to their data needs and to their collection capacity, they gained some confidence in the proceedings” (Foltz, 1993).

The results of this consultation process would need to be tempered at a later stage with considerations of what is feasible. As recommended by Lippeveld and Sapirie (2000): “Enable broad participation in the health information design process, but ensure technical soundness throughout by the use of a health information system design team.” The technical design needs to be firmly linked to the detailed tasks of care and programme administration.

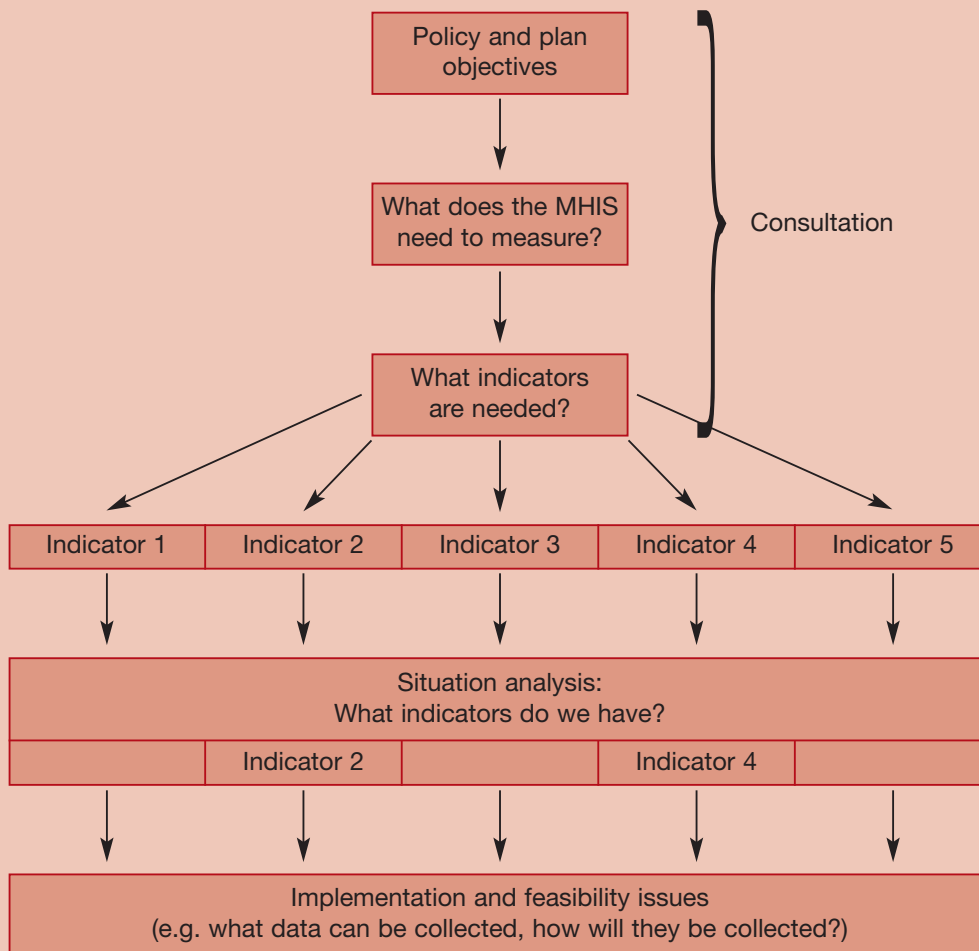
**Task 4: Identify indicators for measuring the policy and planning objectives**

The next task is to begin to translate the policy objectives and consultation into items that can be measured by an information system. As a general principle, to assist planners in making the transition from policy to the required information systems, *indicators are essential* (Lippeveld & Sauerborn, 2000).

Indicators can be used to measure specific aspects of policy implementation. For example, if the introduction of a mental health component into primary health care is a policy objective, a set of indicators needs to be developed to measure the extent of the integration of mental health care into general health care at the primary level. Once these indicators have been identified, the design of the information system can proceed, based on the feasibility of collecting, processing, analysing, disseminating and using the required data (Figure 4).

*The next task is to translate the policy objectives and consultation into items that can be measured by an information system.*

**Figure 4. Moving from policy to information systems: indicators are key**



This task therefore requires the identification of a set of indicators that measure current policy and planning objectives.

Choosing appropriate indicators requires a high degree of judgement and consensus building among potential users (see Consultation, above). In order to keep the list of indicators simple and straightforward, the following questions may usefully be asked (Bodart & Shrestha, 2000):

- > **Validity:** does the indicator measure what it is supposed to measure?
- > **Reliability:** does the indicator provide a consistent measure?
- > **Cost:** is the indicator worth the resources required to measure it?
- > **Relevance:** what useful decisions can be made from the indicator?
- > **Specificity:** does the indicator actually capture changes that occur in the situation under study?
- > **Sensitivity:** does the change shown by the indicator represent a true change in the situation?
- > **Balance:** do we have a set of indicators that measure different components of the mental health service?
- > **Data capture:** how, when and where would the necessary data be captured?

The difficulty posed in selecting indicators is clearly shown in the above example of the definition and selection of national indicators in Cameroon. As Cibulskis and Izard (1996) advise, “Indicator development must consider the reality of health services in developing countries, and the constraints they work under. It would be more valuable to identify what simple measures can be generated from existing systems than to define measures that require special efforts to collect data. Greater attention also needs to be given to potential use of information in decision-making rather than theoretical grounds for selecting indicators.”

#### *A framework for mapping indicators*

In order to map the many indicators that may be used for mental health information systems, a framework is necessary. The WHO framework embraces a range of different subsystems of MHIS that may exist within a country (Sapirie, 2000). The four interrelated “subsystems” include:

- > **Routine service reporting** from the basic health services at primary health care level, formal community mental health services, psychiatric services in general hospitals and specialist mental health services.
- > **Special programme reporting**, such as non-routine data collection for a specific initiative (e.g. a suicide prevention initiative or a mental health promotion programme in schools).
- > **Administrative systems**, including human resources information, drug and logistic systems, and financial information.
- > **Vital registration systems** for births, deaths and migratory movements.

Using the four subsystems and the five essential stages of MHIS, Table 3 presents a framework that may be used for mapping indicators.

*This task requires the identification of a set of indicators that measure current policy and planning objectives.*

*Several key questions need to guide the selection of indicators.*

*In order to map the many indicators that may be used, a framework is necessary.*

**Table 3. A framework for MHIS**

MHIS subsystems	Indicator	Data collection	
Routine service reporting: <ul style="list-style-type: none"> <li>&gt; Primary health care</li> <li>&gt; Formal community MH services</li> <li>&gt; Psychiatric services in general hospitals</li> <li>&gt; Specialist services</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Process: <i>e.g. admission rate, attendance rate, bed occupancy rate</i></li> <li>&gt; Outcomes: <i>e.g. % with symptom relief, % with improved level of functioning</i></li> </ul>	Routine data collection forms	
Special programme reporting (e.g. suicide prevention initiative, MH promotion programme)	<ul style="list-style-type: none"> <li>&gt; Process: <i>e.g. % of staff who received training in MH promotion</i></li> <li>&gt; Outcomes: <i>e.g. behaviour change among adolescents in an MH promotion programme</i></li> </ul>	Programme data collection forms	
Administrative systems	Input: <i>e.g. % of health budget allocated to MH, mental health staff per population; availability of medication and facilities</i>	Budgets, staff establishment, pharmacy stocks	
Vital registration systems	<ul style="list-style-type: none"> <li>&gt; Outcomes: <i>e.g. death rates by cause: suicide, alcohol- related road deaths</i></li> </ul>	Data collection from death registers ( <i>e.g. dept. of home affairs</i> )	

Source: adapted from Sapirie, 2000.

### Stages of MHIS

	Data processing	Data analysis	Data dissemination	Data use
	Summary, quality check and transmission of routine data to district, provincial or central level, depending on the type and relevance of the data	Analysis of data to generate specific indicators (e.g. <i>annual admission rates per 100 000 population to general and mental hospitals</i> )	Dissemination of indicators and data summary to: (i) management at central, provincial and district levels; and (ii) frontline clinical staff	i) Service planning ii) Quality improvement iii) Clinical interventions iv) Evaluation v) Review of MHIS
	Summary, quality check and transmission of programme data to district, provincial or central level, depending on the type and relevance of the data	Analysis of data to generate specific indicators (e.g. <i>% of adolescent population exposed to an MH promotion programme</i> )	Dissemination of indicators and data summary to: (i) management at central, provincial and district levels; and (ii) frontline clinical staff	i) Service planning ii) Quality improvement iii) Evaluation iv) Review of MHIS
	Summary, quality check and transmission of data to district, provincial or central level, depending on the type and relevance of the data	Analysis of data to generate specific indicators (e.g. <i>% of PHC staff with at least 2 days of in-service refresher training in mental health in past year</i> )	Dissemination of indicators and data summary	i) Service planning ii) Quality improvement iii) Evaluation iv) Review of MHIS
	Summary, quality check and transmission of data, depending on the type and relevance of the data	Analysis of data to generate specific indicators (e.g. <i>annual suicide deaths per 100 000</i> )	Dissemination of indicators and data summary	i) Service planning ii) Evaluation

The goal of this task is therefore to produce a set of indicators that can be used to measure policy and planning objectives for mental health. The framework needs to be applied to all of the service levels identified in the WHO pyramid framework – as indicated under the subsystem of routine service reporting. This is crucial, in order to be able to assess the distribution of resources and service activities across the various mental health service levels.

For example, if a mental health policy objective is to develop community-based mental health services, then indicators regarding (i) the service activities in both hospitals and community-based facilities (under routine service reporting) and (ii) the resources allocated to each (under administrative systems for staff and budgets) will be crucial to assess whether community-based mental health services are in fact being developed, or whether the resources and activities are still being maintained within hospital care.

By the end of this task, the team should have identified a set of indicators that could be used to measure key policy objectives.

*The framework needs to be applied to all of the service levels identified in the WHO pyramid framework.*

### **Box 8. Task 4 example: Identify indicators to measure the policy and planning objectives**

In keeping with new mental health policy objectives, and following an extensive consultation process, the task team elects to use the following indicators for each of the subsystems:

> **Routine service reporting:**

*Process:*

- Number of patients treated in mental health outpatient facilities in the previous year, per 100 000 population.
- Annual number of admissions in mental hospitals per 100 000 population.
- Number of patients treated in mental health day treatment services in the previous year, per 100 000 population.

*Outcomes:*

- Global assessment of functioning (GAF) intake and discharge in primary care clinics, psychiatric wards of general hospitals, mental hospitals, community residential facilities, outpatient facilities and day-care facilities.

> **Special programme reporting:**

- Population groups targeted by specific mental health education and awareness campaigns.

> **Administrative systems:**

- Essential medicine classes included in the country's essential medicines list.
- Mental health budget as a percentage of the general health budget (primary, secondary, tertiary).
- Number of beds in psychiatric wards in general hospitals per 100 000 population.
- Number of beds in community residential facilities per 100 000 population.
- Number of beds in mental hospitals per 100 000 population.
- Number of mental health professionals per 100 000 population working in community mental health facilities on 31 December (full-time equivalent staff, by professional role).
- Number of mental health professionals per 100 000 population working in general hospitals on 31 December (full-time equivalent staff, by professional role).
- Number of mental health professionals per 100 000 population working in mental hospitals on 31 December (full-time equivalent staff, by professional role).
- Percentage of psychiatric inpatient facilities in general hospitals in which at least one psychotropic medicine of each therapeutic class (anti-psychotic, antidepressant, mood stabilizer, anxiolytic and antiepileptic) is available in the facility throughout the year.

> **Vital registration systems:**

- Annual deaths from suicide per 100 000 population
- Alcohol-related road deaths per 100 000 population

*Note: this is an example, and does not constitute the recommendation of a minimum data set by WHO. Definitions of indicators are taken from WHO (2005).*

## **Key points: Step 1. Needs assessment**

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### **Task 1: Establish a task team**

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The first task in a needs assessment is to establish a team that will take responsibility for designing and implementing the MHIS. A multidisciplinary task team is needed, support from senior management is essential, and team members should be recruited with a view to the long-term sustainability of the MHIS.

### **Task 2: Review current policy and planning objectives**

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Once established, the first task of the team is to conduct a review of the mental health policy and planning objectives. Information systems that are consistent with policy are more likely to produce the required minimum information within the limited resources available. This task requires the development of an overall vision for the information system: what is the MHIS setting out to achieve, and what policy and planning objectives need to be measured?

### **Task 3: Consult with all relevant stakeholders**

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Having reviewed the existing policy and plans, the task team needs to undertake a consultation process with all stakeholders. This is a continuous process, which should be part of the preceding and subsequent steps.

### **Task 4: Identify indicators to measure the policy and planning objectives**

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The next task is to begin to translate the policy objectives and consultations into items that can be measured by an information system. Indicators are essential for measuring specific policy objectives and their implementation. Certain questions should guide the selection of indicators, particularly their validity, reliability, cost, relevance, specificity, sensitivity, balance and the feasibility of data capture. In addition, these indicators need to be located within a framework of the four subsystems and five stages of the MHIS. By the end of this task, the team should have identified a set of indicators that could be used to measure key policy objectives.

## **Step 2. Situation analysis: what information do we have?**

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### **Task 1: Review the current situation**

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The task team now needs to turn its attention to the existing information system. Is there currently an MHIS? If so, how well is it functioning, and what are the current problems?

The purpose of the situation analysis is twofold:

- To examine what systems currently exist;
- To identify problems in the current systems, and areas for improvement.

This situation analysis needs to be conducted systematically by examining all stages of the current system:

- What mental health data are currently collected?
- How is the information processed and analysed?
- How is the information used for decision-making?
- How is it disseminated?

Throughout this analysis, planners will need to ask whether the current MHIS is fulfilling its purpose, in keeping with the current service priorities. This requires an understanding of the existing indicators that are used and the functions they serve.

### **Box 9. The importance of conducting a situation analysis**

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“No new data collection strategy has the luxury of a clean slate of information systems. There is always a legacy of systems designed for different purposes. If the system is to be rolled out nationally, it is unlikely to be possible to scrap all the existing systems and start again. At least the core of the information to be gathered thus needs to be feasible within the data systems already found in most local services. This places limits on the scope of the data that can sensibly be requested.” (Glover, 2000)

Once again, the framework set out in Table 3 provides a useful template for examining the current system. To use this framework, the task team will need to identify which of the four subsystems are found in the current mental health information systems in the country or region (routine service reporting, special programme reporting, administrative systems and vital registration systems). It should then systematically map how the information is managed through each of the stages: collection, processing, analysis, dissemination and use. For an example, see Table 4 below.

*The task team now needs to turn its attention to the existing information system.*

*The framework used for the needs assessment can be applied to an analysis of the current situation.*

**Table 4. Example: Using the MHIS framework to identify problems in the current MHIS\***

<b>MHIS subsystems</b>	<b>Data collection</b>	<b>Data processing</b>	
<b>Routine service reporting</b>	<ul style="list-style-type: none"> <li>&gt; Poor: staff lack time for collection in clinics, and do not understand the reason for collection</li> <li>&gt; Difficult to sift mental health data from that of the general health services</li> <li>&gt; Purpose of the data collected is not clear</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Little quality checking of data</li> </ul>	
<b>Special programme reporting</b>	<ul style="list-style-type: none"> <li>&gt; Data collection is better here than in the routine services, because the programmes have been established with clear goals, data needs</li> <li>&gt; Weak indicators for MH promotion</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Data processing is adequate</li> </ul>	
<b>Administrative systems</b>	<ul style="list-style-type: none"> <li>&gt; Staffing data are poor because of frequent staff changes</li> <li>&gt; Budget and facility data are available</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Little quality checking of data</li> </ul>	
<b>Vital registrations systems</b>	<ul style="list-style-type: none"> <li>&gt; These systems are largely geared towards general health, and provide little data for mental health planning</li> </ul>	<ul style="list-style-type: none"> <li>&gt; None</li> </ul>	

\* Note: The table provides examples of findings from a situation analysis of a hypothetical current MHIS

Data analysis	Data dissemination	Data use
<ul style="list-style-type: none"> <li>&gt; Data analysis is weak due to lack of analysis skills among management staff</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Little or no data are disseminated back to frontline staff</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Because of poor data quality, it is difficult to use the data for planning</li> </ul>
<ul style="list-style-type: none"> <li>&gt; Data analysis is limited by staff skills</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Data are not disseminated back to frontline staff</li> <li>&gt; Data are disseminated to foreign donors for ongoing programme evaluation</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Data are used for planning and ongoing evaluation</li> </ul>
<ul style="list-style-type: none"> <li>&gt; Data analysis is adequate</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Data are not disseminated to local managers</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Data are used for incremental budget increases, but are not linked to policy and planning objectives</li> </ul>
<ul style="list-style-type: none"> <li>&gt; None</li> </ul>	<ul style="list-style-type: none"> <li>&gt; None</li> </ul>	<ul style="list-style-type: none"> <li>&gt; None</li> </ul>

## **Task 2: Conduct a “walk-through” analysis**

A useful methodology for taking the review further is to conduct a “walk-through” of the current systems. This requires site visits to clinics and hospitals, tracking how data are collected and how data flows through the MHIS. Such site visits need to be conducted only after a thorough understanding of the overall service framework (such as the pyramid framework described above). The framework provides data for a functional analysis of each service facility and level, in order to confirm the important tasks currently being carried out and the information that is currently being collected, processed, analysed, disseminated and used.

During the site visits, interviews can be conducted with key role players: those involved in data collection during routine service delivery, those who are required to compile the collected data, and those involved in analysing and disseminating the data. Qualitative information about staff members’ daily frustrations and successes is extremely valuable here (see example in Box 10 below).

*A “walk-through” requires site visits to clinics and hospitals, tracking how data are collected and how data flow through the MHIS.*

*Interviews can be conducted with key role players.*

### **Box 10. Task 2 examples of walk-through/situation analysis**

#### **1. A “walk-through” analysis of existing hospital-based mental health information systems in Gauteng province, South Africa.**

A hospital walk-through, mapping and form gathering exercise.

“Hospital representatives who formed part of the task team assembled for this project, arranged appointments with key individuals who work with the administration and management of patient records in the hospital.

These individuals were asked to describe the flow of information throughout the hospital for a patient being admitted whose primary diagnosis is psychiatric in nature. Respondents were asked to be storytellers, detailing a patient’s experience of the particular hospital, from admission to discharge and the information collected at each step of the way. To aid this description, a researcher drew a conceptual map of the process that was being described.

Visual mapping of the verbal description aided the researcher to conceptualise the information flows within the hospital whilst serving as a memory aid to the interviewee. Different colours were used to highlight the various steps. Also significant to this technique was the request that interviewees identify the forms used at the various steps being described. Upon completion of each step, the researcher fed back the processes involved, checking for comprehensiveness and correct interpretation. Every effort was made to ensure all steps and associated forms were included.” (Dartnall, Modiba & Lee, 1998)

#### **2. A situation analysis at national level: case study from the Philippines**

“Data for this case study were gathered over the period 1993-1994, during a consultation for the development of a project for Community Health Services in the Philippines. A range of data collection methods and a number of data sources were used. The data collection commenced with a review of written documentation (including DOH policies) of the background to the development of the Field Health Service Information System (FHSIS) and other information systems. Following this review and discussions with DOH counterparts to the study, a list of key informants was prepared for the DOH and five provinces. On a site visit to a province, a purposive sample of facilities was visited. At each facility key personnel involved in information systems activities and health managers were interviewed. In all, 45 person days were spent over a period of three months in interviews, consultations, reviewing documentation and meetings.” (Jayasuriya, 1999)

Usually, this task will clearly show what data are currently collected, processed, analysed and used. It is also likely to show current problems and shortcomings of the MHIS. From the wider analysis and the specific findings of the walk-through, it should be possible to map current problems onto the MHIS framework. This is illustrated in the example provided in Table 4 above which uses the MHIS framework to identify current problems.

*This task is likely to show current problems and shortcomings.*

The conclusion of the situation analysis should leave the task team with a clear understanding of the current difficulties in the MHIS.

## **Key points: Step 2. Situation analysis**

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### **Task 1: Review the current situation**

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In this step, the task team turns its attention to the existing information system. The purpose of the situation analysis is twofold:

- > To examine what systems currently exist;
- > To identify problems in the current systems and areas where they could be improved.

The framework developed in the needs assessment can be used to identify which of the four subsystems are found in current mental health information systems in the country or region. The team will then need to systematically map how the information is managed through each of the stages: collection, processing, analysis, dissemination and use.

### **Task 2. Conduct a “walk-through” analysis**

---

A useful methodology for taking the review further is to conduct a “walk-through” of the current systems. This requires site visits to clinics and hospitals to track how data are collected and how data flow through the MHIS. The findings of the situation analysis should leave the task team with a clear understanding of the current difficulties in the MHIS.

### **Step 3. Implementation: how can we get the information we need?**

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#### **Task 1: Identify the essential MHIS subsystems and indicators**

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The task team now has two sets of information available:

- The needs assessment (Step 1) will have yielded a set of proposed indicators for the MHIS.
- The situation analysis (Step 2) will have presented the team with a map of the main shortcomings in the current system.

The next task is to bring together these two sets of information in order to identify those priority areas of the MHIS that can feasibly be reformed, and to proceed with the reform. This task requires a decision as to which indicators can be accommodated within the existing system, and which aspects of the system need to be reformed to take on any new indicators that have been identified.

Faced with these two sets of information, the team will need to take one of the following routes:

- Expand the existing MHIS to accommodate some or all of the identified new indicators;
- Reduce the list of indicators to fit the current systems; or
- Some combination of these two.

As an example of one of these options, planners in Papua New Guinea adopted the approach of maintaining the existing systems, and reforming them by simplifying data processes, clarifying the purposes and use of the data, and introducing a limited number of new indicators to monitor the latest national health plan (see Box 11).

#### **Box 11. Implementing a feasible HIS in Papua New Guinea**

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“The review identified several problems in data collection, reporting and analysis, but indicated that there would be little benefit in collecting radically different data, changing reporting procedures or establishing different methods of analysis, as this would require major investments in training and support that could not be delivered using available resources. The major change proposed was to limit monthly reporting to a single form, which consisted of a folded sheet of A3 paper, and which combined the essential features of the seven or more forms in use. This would reduce the reporting burden on health facility staff and make it easier for provincial and national staff to compile and analyse data. The form would contain data elements for calculating key indicators already in use and a few additional indicators for monitoring the latest national health plan.” (Cibulskis & Hiawalyer, 2002)

Once again, the stages of the MHIS provide a framework for proceeding with this task. To use this framework, the task team will need to allocate each of the identified indicators to the four subsystems (routine service reporting, special programme reporting, administrative systems and vital registration systems). If a decision is taken to focus on one particular subsystem, for example, information systems for routine service reporting, then the other subsystems will be excluded, and indicators and systems would be set up for this specific task. As stated in the introduction, it is not necessary to plan the entire system from the outset; it may be more feasible to concentrate on small priority areas and then expand later.

*The next task is to bring together information from the needs assessment and situation analysis in order to identify priorities for reform of the MHIS.*

*The team will need to allocate each of the identified indicators to the four subsystems.*

The team will then need to systematically map how the information is to be managed through each of the stages for each of the selected subsystems: collection, processing, analysis, dissemination and use.

Often, this task will quickly show what data can feasibly be collected, processed, analysed and used. It is an essential stage for filtering out those indicators that cannot feasibly be utilized, given existing resource constraints.

In Table 5 (below) an example is provided of how the indicators identified earlier can be assessed for their feasibility in existing systems.

*Thereafter, the team should map how the information is to be managed through each of the stages.*

*This is essential for filtering out those indicators that are not feasible.*

**Table 5. Example: assessing feasibility of the identified indicators within the existing MHIS**

MHIS subsystems	Indicator	Data collection	
Routine service reporting: <ul style="list-style-type: none"> <li>&gt; Primary health care</li> <li>&gt; Formal community MH services</li> <li>&gt; Psychiatric services in general hospitals</li> <li>&gt; Specialist services</li> </ul>	Process: <ul style="list-style-type: none"> <li>&gt; Annual attendances at primary care clinics, by diagnosis</li> <li>&gt; Annual admissions to mental hospitals per 100 000 population</li> </ul> Outcomes: <ul style="list-style-type: none"> <li>&gt; % improved on global assessment of functioning (GAF)</li> <li>&gt; % of consumers satisfied</li> </ul>	Routine data collection forms ✓ <i>But GAF not feasible because of lack of staff training in routine services ✗</i> Available staff time ? No brief, standardized consumer satisfaction instrument available ✗	
Special programme reporting <i>(e.g. suicide prevention initiative, mental health promotion)</i>	Process: <ul style="list-style-type: none"> <li>&gt; % of staff who have received training in MH promotion</li> </ul>	Programme data collection forms. Registers are kept of staff who have received training. ✓	
Administrative systems	Input: <ul style="list-style-type: none"> <li>&gt; % of general health budget allocated to MH</li> <li>&gt; No. of beds in psychiatric wards in general hospitals, mental hospitals and community residential facilities per 100 000 population</li> <li>&gt; Mental health professionals in community mental health facilities, general hospitals, mental hospitals per 100 000 population</li> <li>&gt; % of psychiatric inpatient facilities in general hospital in which at least one psychotropic medicine of each therapeutic class is available in the facility throughout the year</li> </ul>	Data collection forms ✓ <i>But no separate budget for MH at primary care level ✗</i> Accuracy of staff numbers ?	
Vital registration systems	Outcomes: <ul style="list-style-type: none"> <li>&gt; Annual deaths from suicide per 100 000 population</li> <li>&gt; Alcohol-related road deaths per 100 000 population</li> </ul>	Data collection from death registers Accuracy of data?	

Source: adapted from Sapirie, 2000.

### Stages of MHIS

	Data processing	Data analysis	Data dissemination	Data use
	Summary, quality check and transmission of routine data to district, provincial and central levels ✓ <i>Accuracy? (Training programme needed)</i>	Analysis of data to generate specific indicators (e.g. annual admission rates per 100 000 population to general and mental hospitals) ✓ <i>But insufficient HIS time available for analysis ✗</i>	Dissemination of indicators and data summary to: (i) management at central, provincial and district levels; and (ii) frontline clinical staff ✓	1. Service planning 2. Quality improvement 3. Review of MHIS ✓
	Summary, quality check and transmission of programme data to district, provincial and/or central levels ✓	Analysis of data to generate specific indicators (e.g. % of staff who have received two days of in-service refresher training in mental health promotion) ✓ <i>But available outcome data from MH promotion programme insufficient for analysis purposes ✗</i>	Dissemination of indicators and data summary to: (i) management at central, provincial and district levels; (ii) frontline clinical staff and foreign donors ✓	1. Service planning 2. Quality improvement 3. Review of MHIS ✓ <i>But difficult to generalize and apply findings to other service settings ✗</i>
	Summary, quality check and transmission of data to district, provincial and central levels ✓	Analysis of data to generate specific indicators (e.g. staff per 100 000 population) ✓ <i>Weak data analysis due to limited staff skills ✗</i>	Dissemination of indicators and data summary ✓ <i>Analysis of data is not disseminated to HR managers at the regional and district levels ✗</i>	1. Service planning 2. Quality improvement 3. Review of MHIS <i>Limited data quality and weak analysis lead to low utility for planning ✗</i>
	Summary, quality check and transmission of data ✓	Analysis of data to generate specific indicators (e.g. % of deaths due to suicide) ✓	Dissemination of indicators and data summary ✓	<i>Data to be used for advocacy for mental health service needs, but no specific planning possible ✗</i>

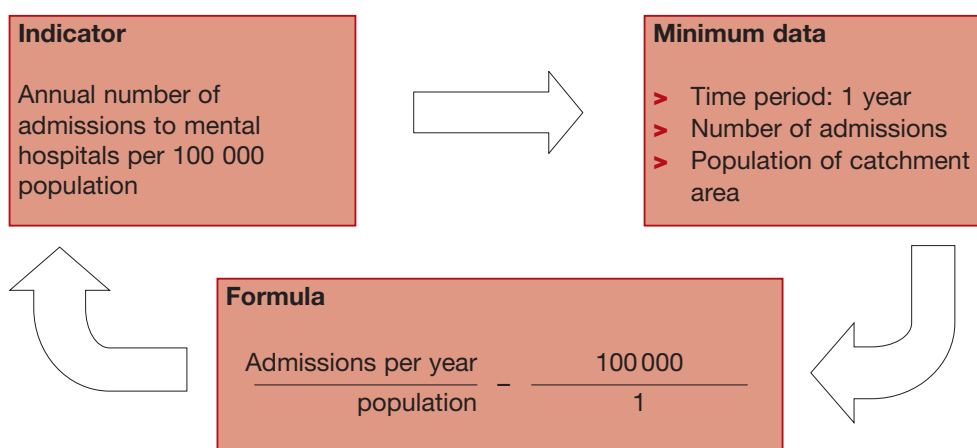
## Task 2: Establish a minimum data set

Once the indicators are mapped, a minimum data set can be identified, based on what is feasible. This requires determining what minimum data are required to provide substance to the identified set of indicators (i.e. operationalizing the identified indicators). For example, if an identified indicator was the annual number of admissions in mental hospitals per 100 000 population, the minimum data required for that indicator would be:

- > Number of annual admissions to mental hospitals in the identified catchment area during a year.
- > Population of the catchment area.

Figure 5 illustrates the relationship between indicators and minimum data, using the example of admission rates.

**Figure 5. Illustration of relationship between indicators and minimum data**



A second example of operationalizing indicators is the percentage of general hospitals with psychiatric inpatient facilities. The numerator for this indicator is the number of general hospitals with psychiatric inpatient facilities, and the denominator is the total number of general hospitals.

A useful set of questions for operationalizing the indicators include the following (Bodart & Shrestha, 2000):

- > What are the sources of the data (numerator and denominator)?
- > At what frequency should the numerator and denominator be collected?
- > At what frequency should the indicator be processed and analysed?
- > Who will actually use the indicator?
- > What is the target (objective) of the indicator that needs to be achieved?
- > What is the threshold (i.e. the maximum or minimum value of the indicator) that should trigger action?
- > What action will need to be taken, based on the measurement of the indicator?

Table 6 below summarizes these questions, using an example that measures the inpatient resources available for mental health in general health care. The purpose of this indicator is to measure the percentage of general hospitals having inpatient psychiatric facilities. This is important in the context of efforts to downscale psychiatric asylums and integrate inpatient mental health care into general health care.

*Once the indicators are mapped, a minimum data set can be determined.*

*Several key questions may be used to operationalize the indicators*

**Table 6. Example of operationalizing indicators: measuring the inpatient resources available for mental health in general health care**

Sources of data	Frequency of collection	Frequency of processing indicator	Level of aggregation	Target	Thresholds and actions
<b>Numerator:</b> Number of general hospitals with psychiatric inpatient facilities <b>Denominator:</b> Number of general hospitals <b>Formula:</b> (Number of general hospitals with psychiatric inpatient facilities/number of general hospitals X 100)	Annual	Annual	Region	40%	<40%: 1. Assess capacity and needs for psychiatric inpatient facilities in general hospitals 2. Develop inpatient psychiatric facilities in general hospitals, if needed.

*Adapted from Bodart & Shestra, 2000 p.69*

In order to produce a complete minimum data set, all the data elements required for all the identified indicators should be listed. MHIS managers and planners will then need to review the proposed list and make practical recommendations as to what is feasible.

In addition, the case-level and transaction data required for routine service delivery (some of which may not be aggregated to indicators) should be determined.

*All the data elements for all the identified indicators need to be listed and reviewed*

**Box 12. Task 2 example: Minimum data set required to assess integration of mental health into primary health care**

Indicato	Minimum data
<ul style="list-style-type: none"> <li>&gt; Percentage of training hours devoted to psychiatry or mental health during specialization of PHC doctors and nurses in primary care, family medicine or general practice</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Numerator: Number of training hours for PHC doctors and nurses devoted to psychiatry/mental health during specialization in primary care/family medicine/general practice</li> <li>&gt; Denominator: Total number of training hours for PHC doctors and nurses during specialization in primary care/family medicine/ general practice</li> </ul>
<ul style="list-style-type: none"> <li>&gt; Percentage of primary care doctors and nurses with at least two days of in-service refresher training in psychiatry/mental health in the past year</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Numerator: Number of primary care doctors and nurses with at least two days of in-service refresher training in psychiatry/mental health in the past year</li> <li>&gt; Denominator: Total number of primary care doctors and nurses working in primary care clinics in the past year</li> </ul>
<ul style="list-style-type: none"> <li>&gt; Percentage of primary care clinics with assessment and treatment protocols for key mental health conditions</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Numerator: Number of primary care clinics with assessment and treatment protocols in place</li> <li>&gt; Denominator: Total number of primary care clinics</li> </ul>

*Note: these are illustrative examples, and do not constitute a recommendation of a minimum data set by WHO.*

**Task 3: Map the information flow**

The next task is to map the information flow within the MHIS (collection, processing, analysis, dissemination and use). The MHIS framework (above) needs to be supplemented with flow charts showing how the information should flow. To illustrate this, Box 13 below gives an example of a flow chart from the Gauteng MHIS in South Africa (Figure 6).

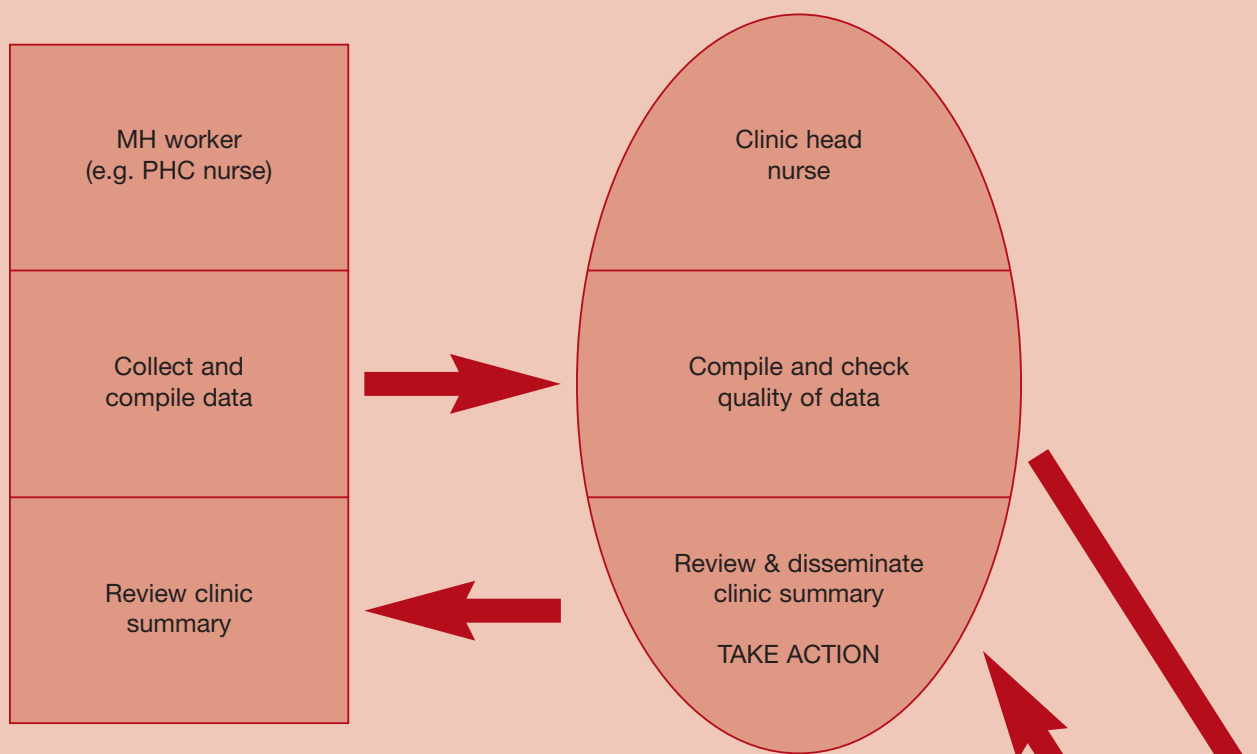
**Box 13. Task 3 example: Mapping the information flow, Gauteng MHIS, South Africa.**

The movement of information begins with collection and compilation by the mental health worker (e.g. the primary health care nurse). The facility and system data are then sent to the clinic head nurse, who compiles and checks the quality of the data. The system data are then forwarded to the regional mental health coordinator who collects the data from all the clinics in the region, checks quality and then forwards the data to both the health information system's regional coordinator and the provincial Mental Health Directorate. The HIS regional coordinator enters the data on a computer, forwarding the data in electronic format to the provincial level HIS Directorate. The HIS regional coordinator also generates a clinic summary and returns this to the regional mental health coordinators. They then return the clinic summaries back to the clinic head nurses who in turn forward them on to the mental health workers.

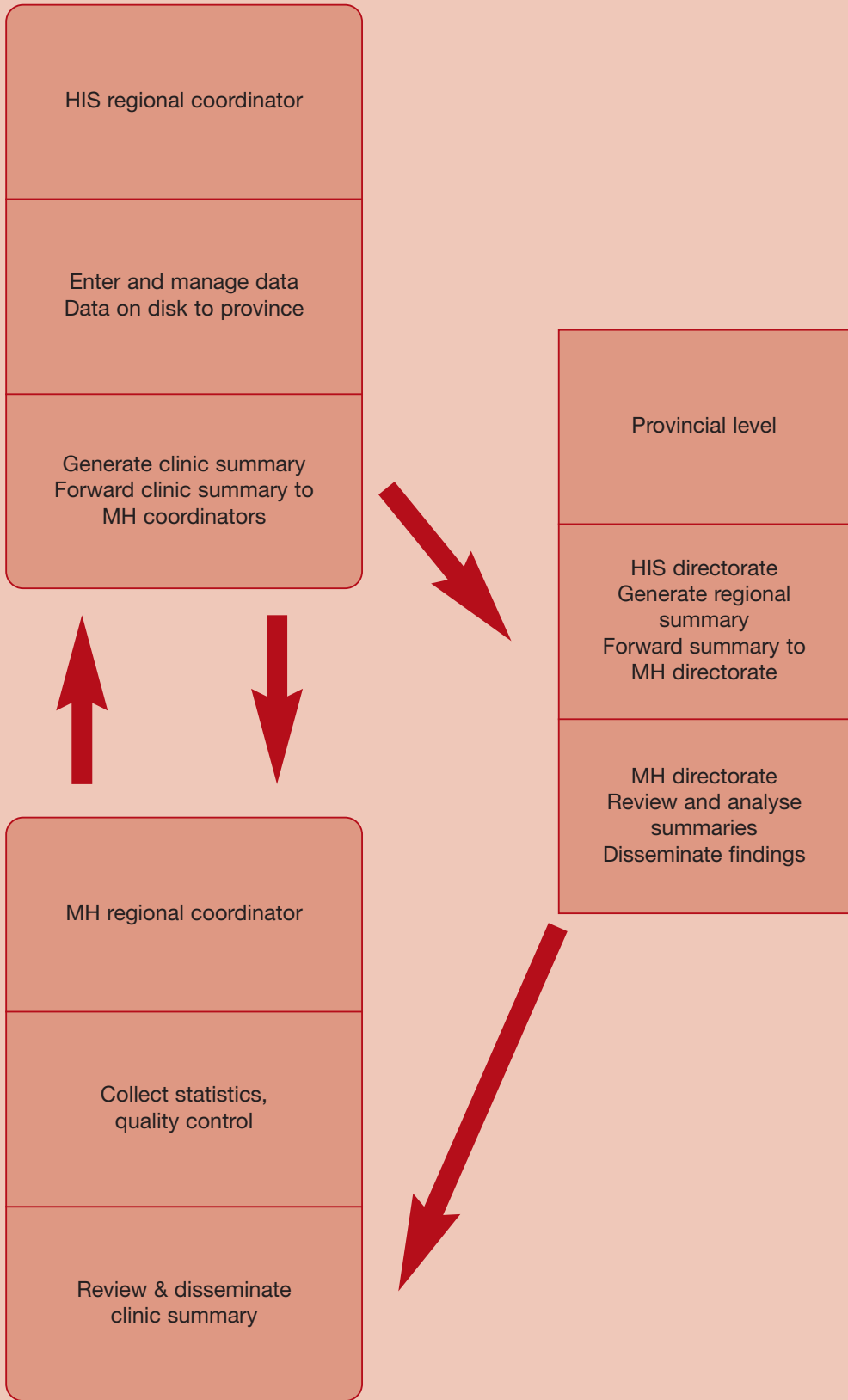
At the provincial level, the HIS directorate receives data from all the regional HIS coordinators, and generates a regional summary. The mental health regional summary is then forwarded to the Mental Health Directorate, which reviews and analyses the summaries. It then disseminates the findings and their implications for planning and service management back to the mental health regional coordinator.

At each point at which the data are disseminated after having been analysed, action is taken in various aspects of planning, management and service delivery, depending on the service level. For example, at the level of the mental health worker, receiving the clinic summary from the clinic head nurse may indicate a need for better time management with patients in clinics. For the mental health regional coordinator, the regional summary may indicate inequalities in service utilization between clinics within a region, and the need to either redistribute staff or recruit more staff in one area. In short, the dissemination of information always leads to decision-making and action (Centre for Health Policy, 1998).

**Figure 6. Example: Information flow diagram in the Gauteng Community Mental Health Information System, South Africa**



Source: Centre for Health Policy, 1998



#### **Task 4: Establish frequency of data collection**

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The flow chart set out in the previous task needs to be located in time, and for this reason it is important to identify the times during an annual cycle when information is to be collected and processed. How frequently data needs to be collected will depend on how frequently data can feasibly be collected and the rate at which change is likely to be observed in the aspect being measured. For example, there is little point in gathering staffing data on a daily basis, when changes are likely to occur only on a monthly basis. The following example is again taken from Gauteng province, South Africa (Table 7).

*The flow chart now needs to be located in time by specifying the frequency of data collection.*

**Table 7. Example: Linking of indicators, data, collection methods and frequency of collection**

Indicator	Type of information	Method of data collection	Frequency of collection
<b>Input</b>			
Health professionals per 1000 patients	Number/ Type	Survey	Annual
Budget		Survey	Annual
Drugs	Match with diagnosis Availability Use at different levels Costs	Routine annual data Routine annual data Routine annual data Routine annual data	Annual
Transport	Allocated; used	Survey	Annual
Beds per 1000 population			
<b>Process</b>			
Referrals	From where, to where	Routine daily data	Monthly
Bed occupancy rate		Routine daily data	Monthly
Bed turnover		Routine daily data	Monthly
Average length of stay		Routine daily data	Monthly
Number of admissions per 1000 population		Routine daily data	Monthly
Number of OPD contacts		Routine daily data	Monthly
Number of patients		Routine annual data	Annual
Activity (including consultation, liaison)		Routine daily data	Monthly
Demographic profile	Age, gender, race	Routine annual data	Annual
Diagnostic profile (discharge diagnosis)		Routine annual data	Annual
Drug profile		Routine annual data	Annual
Transfer out		Routine daily data	Monthly
Referrals		Routine daily data	Monthly
Composition of groups		Survey	Annual
Accessibility	Hours open	Survey	Annual
Integration	Training generalists in general hospitals Training MH team Detection of MH problems at generalist level (e.g. casualty)	Survey Survey Survey	Annual Annual Annual
Referral system	Logical and efficient support to PHC	Survey	Annual
Peripheral hospital or clinic outreach	Hours spent	Routine daily data	Monthly
Cost per patient/day			Annual
Relapse rate		Routine daily data	Annual
Discharge rate		Routine daily data	Annual
<b>Outcome</b>			
Patient satisfaction		Survey	Annual
Family satisfaction		Survey	Annual

Note: Survey = non routine data gathering; Routine daily data = collected daily and collated monthly; Routine annual data = routinely collected once a year

## Task 5: Identify roles and responsibilities

The next task, once the flow of information has been mapped and located in time, is to identify the roles and responsibilities of all the stakeholders in each of the stages of the information system: collection, processing, analysis, dissemination and use. This can be included in the flow diagram, as with Figure 6.

Additionally, it is important that a thorough list be made of all the staff participating in the system, and the tasks, time and skills required of them (see Table 8). This will assist in identifying gaps and training needs. For example, clinical staff may be required to provide case-level information regarding their clinical encounters. The precise information required and the time taken to complete this task need to be specified. To ensure compliance, “providing data on clinical encounters” should be listed as an obligation in the job description.

*The roles and responsibilities of all relevant stakeholders now need to be identified.*

*This may help to identify training needs.*

**Table 8. Example: Tasks and roles of staff in a community MHIS**

Staff category	Tasks	Time required (% of full-time staff)	Skills required
Primary care nurse	<ul style="list-style-type: none"> <li>&gt; Collect and compile data from routine clinic forms</li> <li>&gt; Interpret data results for service delivery</li> </ul>	5%	<ul style="list-style-type: none"> <li>&gt; Data collection</li> <li>&gt; Interpreting data results for clinical practice</li> </ul>
Clerical staff	<ul style="list-style-type: none"> <li>&gt; Collect and compile data from routine clinic forms</li> </ul>	25%	<ul style="list-style-type: none"> <li>&gt; Data collection</li> </ul>
Clinic head nurse	<ul style="list-style-type: none"> <li>&gt; Compile and check quality</li> <li>&gt; Review and disseminate clinic summary</li> </ul>	10%	<ul style="list-style-type: none"> <li>&gt; Data collection</li> <li>&gt; Quality checking</li> <li>&gt; Interpreting results for clinic management</li> </ul>
Mental health regional coordinator	<ul style="list-style-type: none"> <li>&gt; Collect data and check quality</li> <li>&gt; Review and disseminate clinic summary</li> </ul>	10%	<ul style="list-style-type: none"> <li>&gt; Data collection</li> <li>&gt; Quality checking</li> <li>&gt; Interpreting results for clinic management</li> </ul>
HIS regional coordinator	<ul style="list-style-type: none"> <li>&gt; Enter, summarize and manage data</li> <li>&gt; Forward data to province and summary to MH coordinators</li> </ul>	15%	<ul style="list-style-type: none"> <li>&gt; Data capture</li> <li>&gt; Data summary and some analysis</li> </ul>
HIS provincial director	<ul style="list-style-type: none"> <li>&gt; Generate regional summary</li> <li>&gt; Forward summary to MH directorate</li> </ul>	5%	<ul style="list-style-type: none"> <li>&gt; Data summary</li> <li>&gt; Data analysis</li> </ul>
Mental health provincial director	<ul style="list-style-type: none"> <li>&gt; Review and analyse summaries</li> <li>&gt; Disseminate findings</li> <li>&gt; Use data for planning</li> </ul>	15%	<ul style="list-style-type: none"> <li>&gt; Data summary</li> <li>&gt; Data analysis</li> <li>&gt; Data dissemination</li> <li>&gt; Planning</li> </ul>

## **Task 6: Design and distribute materials**

Once roles and responsibilities are clarified and the system has been mapped with a time frame, the practical tasks of designing and distributing materials can begin. This includes preparing instruction manuals and/or procedure manuals, as well as data collection forms. If manuals and forms already exist, these will need to be revised in keeping with the new data requirements. If none exist, new manuals and forms will have to be developed, guided by the data and system requirements.

Detailed guidelines for these tasks can be found in other WHO literature on general HIS development, and are equally applicable here (Lippeveld, 2000b). These include:

- Data collection instruments for case management.
- Data collection instruments for health facility management.
- Data collection instruments for health system management.

It is worth emphasizing that both manuals and reporting formats need to be as simple and easily understood as possible. If tables, diagrams or text materials are too complex, the likelihood of compliance in their use is reduced. For example, a form that does not have face validity (see definitions), and is not easily understood by the person completing it, is likely to be poorly completed.

These materials should then be distributed to the appropriate points in the information system. For example, there may be a certain set of instructions that are required for PHC staff, and another set for HIS management staff. If necessary, the appropriate computer equipment will also need to be distributed, and associated support mechanisms established.

Examples of mental health data collection forms are provided in Annex 2.

Several strategies may be used to assist with this stage of implementation (see Box 14 below for an example from Papua New Guinea).

### **Box 14. Task 6 example: Good practice in implementation in Papua New Guinea**

Good information systems may fail if they are poorly implemented. In Papua New Guinea, several strategies were used to reduce the risk of failure. Widespread consultation ensured that staff were aware of the changes and had contributed to them, and that the system's design was realistic. Testing on a limited scale helped to confirm the system's appropriateness. Improved analysis and dissemination of information before implementation created a more favourable climate in which to introduce new systems. It stimulated interest in information, generated support from senior levels in the Department of Health, and gave credibility to the programme managers leading the change.

Attention was given as to how the system would be introduced into each province, with the organization of workshops, printing and distribution of stationery, revision of computer software, and discontinuation of existing systems. Private printing companies and training schools were kept apprised of the changes. At national level, procedures were established for follow-up of missing reports, data quality control, updating coding systems, data summary and provision of feedback. Provisions were included in the National Health Administration Act, 1997, to compel all health facilities to report using the National Health Information System (NHIS). Certificates were awarded to the health facilities and provinces that provided the best reports. Financial support was secured for stationery, freight/postage, communications, periodic upgrading of computers and software (Cibulskis & Hiawalyer, 2002).

*Instruction manuals, procedure manuals and data collection forms can now be prepared.*

*The manuals and forms should be simple and easily understood.*

## **Task 7: Schedule staff training**

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Training is required for managers, administrative and clinical staff in information gathering, analysis and use. The situation analysis in Step 2 should have made clear the gaps in current staff skills. This information can be used to target specific training needs in a country or region. For example, weak analysis of data at the local planning level can highlight the need to train local planners in analysis of the data they receive from the community and hospital mental health services. This is likely to lead to improved decision-making at the local level as well as to improved data quality for regional and national planning (Cibulskis & Hiawalyer, 2002).

Improved efficiency and effectiveness can result from including consultation in the design of information system training programmes (see Box 15 below for an example from Pakistan).

### **Box 15. Task 7 example: The link between training and consultation in Pakistan**

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“The process of achieving all-round efficiency is complex. As part of the efforts to improve the Management Information System (MIS), the MIS Unit and the field teams stepped up the training of field workers in the production and use of information in December 1989. MIS workshops were held at each field site. This included the identification of those data items which the field workers considered useful in their work. By identifying a minimal set of data that was acceptable to the field workers, this joint effort facilitated the evolution of the MIS into a more efficient system. A new activity register was developed which had fewer columns and was easier to fill in than the old format, and the frequency of reporting was decreased to quarterly from monthly. The field teams are now able to use the register to monitor their households more effectively and use their time more efficiently.” (Husein et al., 1993)

## **Task 8: Address practical barriers to getting the needed information**

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During the course of implementing the MHIS, several barriers will inevitably be encountered. Some of the barriers to MHIS implementation are discussed in this section (see also Barriers and Solutions in section 4 below for more detailed information).

### **Staff opposition**

Staff opposition to the reform of the MHIS or to the introduction of a new system is likely to arise for several reasons. These include changes to established work patterns, the requirements for new skills, added responsibilities and additional demands on their time, and staff perceptions of the usefulness of data to their daily clinical workload. The opposition may take direct forms (such as outspoken objections or a refusal to complete tasks) and indirect forms (such as poor data quality or late delivery).

To address these forms of opposition, it is essential to consult with staff early in the situation analysis and needs assessment phases of the development of MHIS. As noted earlier, staff are more likely to contribute usefully to the ongoing functioning of the system when they have been consulted, feel a sense of ownership of the system and understand the purpose and benefits of the data they collect.

In addition to “pre-emptive” consultation, it is also important to establish communication and support systems to address grievances or problems of poor quality data during the routine functioning of the system. The quality of the data received in the MHIS is likely to affect the quality of the planning decisions that are made. It is therefore

*Training is required in a range of areas, based on the gaps identified in the situation analysis*

*Several barriers may be encountered during the implementation phase.*

*Staff opposition may arise for several reasons...*

*...and should be addressed early by means of thorough consultation.*

*Communication and support systems also need to be established for staff.*

in the interests of those who manage information systems to take all measures necessary to ensure the smooth running of the system. The use of positive incentives, such as rewards for good quality data reporting, has proved successful. (See example for task 6 above: Good practice in implementation in Papua New Guinea (Box 14), for some of the strategies that may be adopted).

### ***Inadequate technology: the issue of computerization***

The development of appropriate technology to manage the MHIS is essential. In many countries, insufficient attention is given to the potential benefits and long-term savings that can result from investment in information technology (IT). In many countries, lack of funding, technical resources and skills impedes the realization of this goal.

However, it is important to note that automation of the system does not necessarily amount to reform. Unless careful thought is given to the purpose of the MHIS, automation can simply lead to a repetition of the same mistakes that were made when data were collected and processed manually (Taintor & Laska, 2002). As Wilson cautions: “it is important to ensure that computerisation does not dominate the health information system improvement process. The majority of information users in developing countries have no access to computer technology, and the development and improvement of manual systems for the collection and analysis of data should be the primary focus. Computerisation should only be undertaken when it supports the overall objectives of improving health surveillance and service performance.” (Wilson, 2000)

System planning and careful software development are of the utmost importance in a computerized system – much more so than for manual systems. Computerized systems are difficult to change, once put in place, due to difficulties in modifying computer “code” and changing interfaces and databases. These all take time to implement and test, and, in many cases, old databases have to be converted into the new format. All this requires time, skill and computer expertise to implement successfully.

Experiences in the Pacific islands have shown that in the long term computerized systems failed to alleviate the problems of poor reporting or lack of analysis, and created additional problems (Finau, 1994). A report by an international workshop on HIS and microcomputers in primary health care only includes one recommendation specific to computerization. Its remaining recommendations all apply equally to manual information systems (Wilson & Smith, 1991). The development of an electronic MHIS needs to take into account some of these issues, while also considering ongoing maintenance and training costs. Careful planning is therefore needed for the automation of an MHIS.

This is particularly so in relation to human resource management. Getting staff buy-in is essential, particularly because staff may have anxieties about using computers. Staff will need further training, direct assistance and ongoing support, with opportunities for continuous feedback. Consultation is useful for developing specifications for the system, and staff with experience in implementing the manual MHIS would add value to this process.

In assessing the appropriateness of computerized systems, the option of partial computerization should also be considered. In those areas where clerical labour may be less expensive than the use of corresponding computers, hierarchical systems are possible (for example, hand-counting at the local level, especially for small clinics), with the aggregated data being passed up to higher levels and “computerized” at some point up the chain. For many low-income countries, a widespread “paper and pencil” information system, with computerization of the aggregated data at the upper levels, is a practical solution.

*Careful planning is needed for the introduction of new information technologies.*

This said, however, unless raw data are passed up the hierarchy, it is not possible to redefine and refine indicators following the collection of the data. For example, if the same data are to be used to calculate a range of different indicators, the raw data need to be retained by manual portions of the system until such time as they can be entered into a computerized system.

Many of the issues related to information technology are the same for HIS and MHIS, and are dealt with more comprehensively in other WHO publications (Wilson, 2000). A good overall view of a computerized MHIS can be found in Ustun et al. (1994). Two examples of computerized MHIS are:

Nathan Kline Institute for Mental Health/WHO instrument (<http://www.rfmh.org/ssed/who/mhis>); and

Sri Lanka MHIS, Batticaloa (available on request from WHO Mental Health Policy and Service Development team, Geneva).

### **Task 9: Build in quality checks**

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As a way of addressing many of these obstacles to implementation, quality checks need to be built into the MHIS. Ongoing quality checks are essential for routine data systems, particularly if service planning decisions are to be based on the information generated by the system (Centre for Health Policy, 1998). These checks can be introduced at all stages of the MHIS: collection, processing, analysis, use, and dissemination.

Sources of error might include (Centre for Health Policy, 1998):

- Reporting error: the person completing the statistics does so incorrectly and does not pick up the mistake.
- Input error: there is an error when the data are entered into the computer from the paper form.
- Maintenance error: information in the database is inaccurate, incomplete or out of date.

Missing data are a common problem in MHIS, and can be due to either reporting or input error.

Each person identified in the earlier roles and responsibilities can be required to address these errors by including quality checking in their job description. Spot checks may be used to detect data inconsistencies or failures in data capture. Mandatory fields can also be introduced in order to address the issue of missing data. These measures will make it easier to detect the source of ongoing errors.

In addition, feedback is essential to improve data quality. Clinicians, managers and medical records staff will be more inclined to input data comprehensively and accurately if they are able to extract (or be provided with) regular reports that are beneficial at a local level.

As an example, in New Zealand the mental health information collection system (MHINC) uses a formal audit process, during which auditors compare the information being sent in to that contained in file notes, using a randomized process. This audit helps improve the data collection of the service provider. The process is ongoing in that there are regular rounds of provider audits. In addition, the data are monitored, and gaps or major changes to the data coming in are discussed with the providers on a monthly basis, thus completing the feedback loop.

*Staff training and support need to be carefully considered if a decision is taken to introduce new information technologies.*

*Ongoing quality checks are essential for routine data systems.*

*Errors may occur in reporting, input and maintenance.*

*Feedback is essential to improve data quality.*

One of the issues in attempting to develop a mental health information system that spans a number of hospitals/providers is that people may be counted twice when they visit more than one agency. This creates a major error in access rate data. This problem can be addressed by developing a unique identifier for each service user to facilitate accuracy of data collection and ongoing quality improvement. For example, New Zealand has developed a national health index number, which is a unique identifier allowing people to be counted only once even when they access a range of mental health and alcohol and other drug services.

A broader quality issue is that there will always have to be compromises between what is desirable to collect and what is feasible to collect. Since too many data fields tend to reduce data quality, it will be necessary to consider what is absolutely essential when creating indicators. This relates to the earlier discussion of the minimum data set.

For a further discussion on quality in mental health, see the module: *Quality Improvement for Mental Health*, available at: [http://www.who.int/mental\\_health/resources/en/Quality.pdf](http://www.who.int/mental_health/resources/en/Quality.pdf)

### **Task 10: Conduct a pilot project**

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A pilot project is a useful means of testing the feasibility of an MHIS and ironing out implementation difficulties. Conducted on a smaller scale than the large-scale implementation of a national or regional MHIS, a pilot project can quickly demonstrate the potential pitfalls and successes of a proposed larger MHIS, at a considerably lower cost. Pilot projects provide valuable lessons regarding both the design and implementation of an MHIS. Box 16 below provides an example of the use of a pilot project in the national roll-out of the New Zealand Mental Health Information Project.

### **Box 16. Task 8 example: Using a pilot project in the national roll-out of the New Zealand Mental Health Information Project**

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#### **Background**

“The Mental Health Information Project (MHIP) flowed from the acknowledged need for national-level information about the mental health sector. Existing national collections of information from mental health service providers are incomplete, inflexible and - in some instances - up to three years out of date. The objective of the MHIP is to provide complete, accurate and timely information on secondary mental health services. This will allow adequate monitoring of the implementation of the national mental health strategy and provide a database for research into the provision of mental health services. Information that does not identify individuals will also be available to providers, consumer groups, the Ministry of Health, the Health Funding Authority (HFA), the Mental Health Commission, and other interested parties in the sector.

#### **Pilot**

The pilot phase of the MHIP, which took place between March and May 1997, was successfully completed. This phase confirmed that it is possible to extract and store data, and to report on the information obtained from mental health service providers in a cost-effective manner.”

Source: <http://www.nzhis.govt.nz/documentation/mhinc/mhip.html>

However, caution should be exercised in interpreting the results of a pilot project. Its success may at least partially be attributed to a high level of staff motivation often associated with such projects. The ease of implementing a small-scale project, relative to a large national one, also needs to be borne in mind when measuring its success.

*The problem of double counting can be addressed by developing a unique identifier for each service user.*

*Compromises between what is desirable and what is feasible will always be necessary.*

*A pilot project is a useful means of testing feasibility and ironing out implementation problems.*

Similarly, when drawing from experiences elsewhere, it is important to distinguish between small-scale and national systems, as there are particular, favourable characteristics in small-scale systems compared to national systems (for example, the ratio of HIS technical assistance to health staff is generally higher, and lines of communication are relatively direct) (Cibulskis & Izard, 1996). The following list of reference materials may be grouped according to their relevance for small-scale and national-scale settings:

Small scale (single facility to provincial level)	Centre for Health Policy, 1998; Dartnall, Modiba & Lee, 1998; Husein et al., 1993; Lee & Dartnall, 1998.
National scale	Bodart & Shrestha 2000; Cibulskis and Hiawalyer, 2002; De Kadt, 1989; Finau, 1994. Foltz, 1993; Jayasuriya, 1999; Glover, 2000; Robey & Lee, 1990; Taintor & Laska, 2002.

### **Task 11: Roll out the MHIS**

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Once the pilot project has identified final implementation issues, the roll-out of the MHIS can begin, with “live” data collection and processing. The implementation procedure for roll-out of the MHIS should be clearly spelt out in the form of an operational plan. Its specific details will depend to a large extent on the particular circumstances of the country. A checklist is essential for implementation. This may serve as a tool for exploring possible reasons for failure when obstacles are encountered. This checklist might include:

- > Design of data collection forms (see Task 6)
- > Staff training and time spent learning applications (see Task 7)
- > Design/adaptation of hardware and software (see Task 8)
- > Quality checks (see Task 9)
- > Data entry
- > Data maintenance
- > Data retrieval

Once again, special attention to incentives for staff is vital to the system’s ongoing success.

### **Box 17. Task 11 example: Designing the HIS for optimal use in Papua New Guinea**

“Attempts were made to increase the analysis of information at all levels of the health system. Health workers were provided with tools and training in data analysis including a ‘Health centre record’ – a booklet designed to assess trends over time and provide a permanent record of a health facility’s activities. At provincial level, strategies for analysing indicators were reinforced by revising computer software and training provincial managers.

At national level, analysis and dissemination were initially limited to an annual booklet on family health indicators. By limiting the analysis to a small area of activity in which data were readily available, and considered important, the publication could be prepared in advance of an annual meeting of provincial health managers where performance of individual provinces was publicly disclosed. Such feedback helped to increase reporting rates from 73% in 1994 to 85% in 1995 and to 93% in 2000.

Improvements in information systems eventually allowed the government to undertake more extensive analysis and use information for assessing priorities in the national health plan. Targets were set on the basis of previous performance statistics and they helped managers to assess which health programmes were proceeding as planned and how each province was performing.” (Cibulskis & Hiawalyer, 2002)

*Lessons learnt from other settings need to be interpreted to suit the local context.*

*The roll-out procedure for the MHIS should be spelt out in an operational plan.*

## **Key points: Step 3. Implementation**

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### **Task 1: Identify the essential MHIS subsystems and indicators**

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The task team should bring together information from the needs assessment and situation analysis, to enable identification of those priority areas of the MHIS that can feasibly be reformed, and to proceed with the reform. The team will need to systematically map how the information is to be managed through each of the stages for each of the selected subsystems. This task will often quickly show what data can feasibly be collected, processed, analysed and used.

### **Task 2: Establish the minimum data set**

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Once the indicators are mapped, a minimum data set can be identified, based on what is feasible. This requires identifying what minimum data are required to ensure that the selected indicators are meaningful (i.e. operationalizing the identified indicators).

### **Task 3: Map the information flow**

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The next task is to map the information flow within the MHIS (collection, processing, analysis, dissemination and use).

### **Task 4: Establish frequency of data collection**

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The flow chart set out in the previous task needs to be located in time, and for this reason it is important to identify the times during an annual cycle when information is to be collected and processed.

### **Task 5: Identify roles and responsibilities**

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The next task is to identify the roles and responsibilities of all stakeholders in each of the stages of the information system.

### **Task 6: Design and distribute materials**

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Once roles and responsibilities are clarified and the system has been mapped, along with a time frame, the practical tasks of designing and distributing materials can begin. This includes preparing instruction manuals and/or procedure manuals, as well as data collection forms.

### **Task 7: Schedule staff training**

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Training is required for managers, administrative and clinical staff in information gathering, analysis and use. The situation analysis in Step 2 should have made clear the gaps in current staff skills. This information can be used to target specific training needs in a country or region.

### **Task 8: Address practical barriers to getting the needed information**

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During the course of implementation of the MHIS, it is inevitable that several barriers will be encountered. Two key areas are staff opposition and inadequate technology.

### **Task 9: Build in quality checks**

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To help address many of these obstacles to implementation, quality checks should be built into the MHIS.

### **Task 10: Conduct a pilot project**

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A pilot project is a useful means of testing the feasibility of an MHIS and ironing out implementation difficulties.

### **Task 11: Roll out the MHIS**

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Once the pilot project has identified final implementation issues, the roll-out of the MHIS can begin, with “live” data collection and processing. The implementation procedure for roll-out should be clearly spelt out in the form of an operational plan that indicates the process of implementing the MHIS.

### **Step 4. Evaluation: how well is the MHIS working?**

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The implementation of an MHIS would not be complete without an evaluation. In this final step, the task team is required to evaluate the MHIS, now that it is up and running. It should be emphasized that evaluation is an integral part of the design and implementation of an MHIS and should not be tacked on as an afterthought. Criteria for the evaluation should be considered from the outset, during the needs assessment and situation analysis (see above). Indeed, the situation analysis is in itself a form of evaluation, and it can provide valuable lessons for future evaluations.

Evaluation is essential to ensure the ongoing quality of the system (Lee & Dartnall, 1998). However, it is a distinct process from ongoing quality improvement, discussed in Step 3 above. An evaluation is a less frequent process that brings together various stakeholders to measure the extent to which the MHIS is achieving its stated aims and objectives.

### **Task 1: Establish criteria for evaluating the MHIS**

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The first task is to establish the criteria for evaluating the MHIS. Clear definitions for each criterion are essential for clarifying what aspect of the system that criterion is attempting to measure. Table 9 provides an example.

**Table 9. Criteria for evaluating the mental health information system**

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Evaluation Criteria	Definitions
Validity	The extent to which the data collected reflect the true situation
Reliability	The extent to which the data provide a consistent measure
Sensitivity	The extent to which the system is able to detect changes in the services provided as well as monitor trends
Accuracy	The extent of precision of the data
Completeness	The extent to which the routine data gathered are complete
Timeliness	The extent to which information is available to decision-makers in a suitably appropriate period of time to ensure data-based decision-making
Relevance	The extent to which the system is relevant to all levels of the health service (e.g. occurrence of feedback to peripheral levels and level of local analysis)

*Once the MHIS is up and running, it should be evaluated.*

*The first task is to establish the criteria for evaluation*

Utility	The extent to which the MHIS assists managers and clinicians in their decision-making and actions; and the extent to which the MHIS helps the planning process
Simplicity of administration	The extent to which the system is user-friendly and can run without excessive logistic support
Acceptability	The extent to which the system is acceptable to end-users
Feasibility	The extent to which the system is feasible and affordable
Flexibility	The ability to adapt the pace of progress and areas of support to local needs and resources while maintaining the overall framework

Source: Lee & Dartnall, 1998

## **Task 2: Establish a framework for evaluating the MHIS**

The next task is to establish a framework for evaluation. In this framework it is important to ask specific questions:

1. Which *main aspects*, and *specific aspects*, of the MHIS need to be evaluated?  
Main aspects include:
  - Stages of the MHIS (collection, processing, analysis, dissemination and use);
  - Functioning of the MHIS at different service levels (PHC, formal CMHS, psychiatric services in general hospitals and specialist institutions);
  - Effectiveness of the MHIS: does it enable decision-making?
  - Efficiency of the MHIS: do its benefits outweigh its costs?

Specific aspects refer to the methods of operationalizing each of these main aspects (see Table 10, below).

2. What *perspective* is needed or is the most useful? For example, questioning whether feedback of information occurs at facility level is best captured from the viewpoint of clinicians, not management.
3. Which research instrument is the most appropriate? For example, when evaluating difficulties in collecting and processing data, it may be more appropriate to distribute questionnaires to a representative sample of facilities rather than conduct time-consuming interviews.

Table 10 is an example of a comprehensive framework which was developed for evaluating the Gauteng MHIS in South Africa.

*A framework for evaluating the MHIS should be established.*

**Table 10. Framework for evaluation of the mental health information system in Gauteng, South Africa**

Main aspects MHIS	Specific aspects	Research instruments and perspectives					
		Int	Int	Int	Obs	RR	QU
		Clinicians	HIS clerks	Management			
<b>Stages</b>							
Collection	Attitudes to collection	+	+	+			
	Availability of forms	+	+	+	+		+
Process	Transmission	+	+	+			+
	Collation	+	+	+			+
	Data preparation		+				
Analysis	All data analysed?	+	+	+			+
	Aggregation of data from different levels	+	+	+			+
Dissemination	Constructive	+		+		+	
	Relevant	+		+			
	Immediate	+		+			
	Selective	+		+			
	Presentable	+		+			
	Appropriate	+					
	Accurate					+	
	Reliable					+	
	Complete					+	
	Timely	+		+			
	Standardized	+	+			+	+
	User-friendly	+					+
Local participation	+					+	
Use	At different levels of the MHS	+	+	+			+
<b>Functioning at different service levels</b>							
Facility	Integrated and coordinated Aggregation and analysis at each level Staff trained	+	+	+	+	+	+
District							
Regional							
Provincial							
National							
<b>Effectiveness: enables decision-making at different stages of the planning cycle</b>							
Assessment		+		+			
Planning objectives	Specific	+		+			
	Measurable						
	Appropriate						
	Realistic						
Time-bound							
Implementation		+		+			
Evaluation		+		+			
<b>Efficiency of MHIS: using a systems approach</b>							
Input	Budget, staff			+			+
Process	(see "Processes" in above rows)						
Outcomes	Reports	+			+		+

Key: Int = interview; Obs = observation; RR = record review; QU = self administered questionnaire; + = suitable instrument and perspective to gather data on specific aspects of MHIS

Source: adapted from Lee & Dartnall, 1998

### **Box 18. Task 2 example: Establishing a framework for evaluating the MHIS**

A year after piloting the new MHIS, the task team undertakes an evaluation of how well it is working. There are concerns that some facilities are sending in forms erratically or that they are not complete. Moreover, the collated forms are piling up in the central office and have not been completely analysed. Some of the criteria for evaluation had been discussed during the earlier needs assessment and situation analysis stages, and this provides a foundation for the evaluation.

The following is a proposed series of steps:

- 1 Formulate terms of reference for the evaluation. This includes clarifying specific objectives of the evaluation (including the most pressing concerns), who is responsible for it, time frames, budget and limitations.
- 2 The following evaluation is then implemented (after initial piloting of the newly developed instruments, as no standardized instruments were identified):
  - Questionnaires are sent to a representative sample of urban and rural facilities to be completed by all clinicians. Questions include amount of time taken in completing the MHIS forms, attitudes to completing the forms, and availability of forms.
  - Semi-structured interviews are held with clinicians at three rural and three urban clinics to explore at greater depth the issues raised by the results of the questionnaire.
  - Semi-structured interviews are also held with HIS clerks at the regional and head offices concerning collection, processing, analysis and dissemination of data.
  - Observation: HIS clerks are given a tick sheet to complete regarding availability of MHIS forms on their routine weekly visits to facilities.

Findings of the evaluation:

- Clinicians report having to spend 10% of their time completing the forms if they are to complete them accurately. They want to spend less time on this. They report that the feedback report after the first three months of the pilot was useful and made them feel that completing the forms was worth the effort (i.e. that the information they received helped them in routine mental health care). They are disappointed that they have not received any feedback since that initial report. Significantly more rural clinics than urban clinics report that the forms are not always available at the clinic. A third of clinicians report they are not sure to whom they are to give the completed forms.
- HIS clerks report feeling demoralized at the lack of clarity of their job description. They state that the supply of MHIS forms from the central stationers is unreliable, and that they have insufficient time to enter the data. They also feel that their training in data analysis was too short and that they require further training.

Recommendations from the evaluation:

- Simplify the forms and process procedures still further.
- Reduce the data requirements for routine collection.
- Increase support to HIS clerks in terms of working conditions and training
- Review supply of blank forms and transmission of completed forms within the next two months.
- Plan to provide feedback to clinicians within three months. Plan to send a regular two-page report at six-month intervals.

### **Task 3: Compare with baseline assessment**

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The progress of the MHIS can be evaluated by repeating the measures taken at baseline. For example, the subsystems' stages of data collection, processing, analysis, dissemination and use can be evaluated and compared to the baseline measures. The purpose is to compare development at each of the stages of the MHIS over time (see Task 2 example, above).

*Measures taken at baseline should be repeated to enable comparison.*

### **Task 4: Timing of evaluations**

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As a general principle, it is essential to conduct periodic evaluations of the MHIS. The frequency of these evaluations will depend on such issues as availability of resources, the difficulties encountered in the design and implementation of the system, and the complexity and scale of the system. See also Table 7 for examples of frequency of collection of different indicators.

As a way of maximizing resources, it may be useful to conduct routine evaluations at the same time as wider evaluations of the mental health system are done, for example as part of routine service planning evaluations (see modules: *Planning and Budgeting to Deliver Services for Mental Health and Quality Improvement for Mental Health*).

*It may be useful to conduct routine evaluations of the MHIS at the same time as wider mental health system evaluations are done.*

### **Box 19. Case example: Evaluating the MHIS in Gauteng province, South Africa – a service manager's perspective**

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Evaluating the MHIS in Gauteng province in South Africa over the past 10 years has required an understanding of the context of events that unfolded during this time. When South Africa achieved a democratic government in 1994, the country was divided into nine provinces. Previously racially fragmented health services were integrated into nine provincial departments of health. The National Department of Health provides guidance and oversees the work done in the provinces, but provinces are responsible for service delivery. Since 1994, substantial work has been undertaken to develop district health services in order to implement the policy of equal access to comprehensive primary health care services for all South Africa's citizens. At the same time, secondary and tertiary level services have had to be developed in some areas and rationalized in others. Systems for monitoring and evaluation of services had to be established and information systems within provinces and in the country as a whole had to be developed and coordinated. The experiences of establishing mental health information systems in Gauteng need to be evaluated in the above context.

The initial work on MHIS within Gauteng province was done by the Mental Health Directorate of the Gauteng Health Department, in partnership with the Centre for Health Policy at the University of the Witwatersrand. The first area of attention was to develop an information system for the Gauteng specialist ambulatory mental health service (MHS) within the District Health Service. This information system was implemented with the expectation that there would be regular analysis of data, and feedback reports to all levels of stakeholders (clinic staff, regional coordinators and provincial mental health managers). However, the system broke down because the HIS department did not have the capacity to capture the data effectively and then to analyse it or provide feedback reports.

Subsequently, the province developed a comprehensive District Health Service (DHS) Minimum Data Set (MDS). The existing specialist ambulatory MDS for MHS was incorporated into this. In addition, two indicators were included in the primary health care (PHC) MDS. The major problem with this DHS MDS is that it was a maximum data set! Everyone (including mental health service managers, general health service

managers and clinicians) wanted items included in it. The result was a huge amount of data of questionable quality, and the HIS department was unable to process the data effectively.

In order to evaluate how information systems were working, a review of some indicators was undertaken. The two PHC indicators from the first year of operation of the DHS MDS were reviewed. These were: acute mental illness (number of newly detected patients with mental illness/total PHC headcount), and chronic mental illness (down-referral to PHC = number of patients seen at PHC clinic with chronic mental illness/total PHC headcount). Both these indicators were well below target norms (<1% and 1.6% respectively). This may be due to underdetection of mental disorders at PHC level, as well as to poor referral of chronic patients to PHC, but it may also reflect inadequate completion of daily and monthly forms at facility level.

In addition, there was a review of the defaulter rate in the specialized ambulatory mental health service in the DHS. This was revealed to be 7%, comparable to surveillance checks done in the service. However, when raw data from the information system were examined, it was full of gaps and extreme inaccuracies (the defaulter rates ranging from 0 to 100 %!).

As a result of this learning experience, the province undertook a review of the District Health Service MDS, and the number of data elements in the specialist ambulatory MHS HIS was reduced from well over 100 to just 22. The two MHS indicators at PHC level were retained. This new MDS is currently being piloted.

As a result of the lack of useful information from the MDS, a survey of the mental health services was undertaken in 2001. Forms were developed for hospital and ambulatory services, which were then collated into a report that was widely distributed to clinicians and managers (See Annex 3 for further information from this report). Information from this report has been used in various other reports and presentations with a view to improving services and increasing staff motivation. This is the kind of survey that can be conducted every 2 to 5 years in order to track changes. It can also be used to inform the process of development/review of an MDS. Although a routine MHIS is preferable, for managers who are in the early stages of developing an MHIS this form of non-routine survey may be a useful alternative.

Lessons learnt:

1. Developing MHIS often occurs in the context of other major changes within health systems. Role-players need to understand the impact and constraints that such changes entail, in order to try to work within generic health information systems where possible. But they also have to be patient, think creatively and use other information-gathering methods when needed.
2. Start small and exclude unnecessary information in the information systems.
3. Service providers/clinicians can make a valuable contribution to the development of information systems, since they are the front-line workers and have experience in completing innumerable statistical forms on a daily basis. They therefore need to be involved in this work.
4. All role-players need to have a clear understanding of the aims of collecting data and the usefulness, or lack thereof, at all levels.

*Source: Rita Thom, personal communication. (Note: this is a personal opinion/review, and does not constitute the official view of the Gauteng Health Department).*

## **Key points: Step 4. Evaluation**

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The implementation of an MHIS would not be complete without an evaluation. In this final step, the task team is required to evaluate the MHIS, once it is up and running. It should be emphasized that evaluation is an integral part of the design and implementation of an MHIS, and should not be tacked on as an afterthought.

### **Task 1: Establish criteria for evaluating the MHIS**

---

When establishing the criteria for evaluating the MHIS, clear definitions for each criterion are essential to clarify what aspect of the system the criterion is attempting to measure.

### **Task 2: Establish a framework for evaluating the MHIS**

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When establishing a framework for evaluation, it is important to ask specific questions:

1. Which main and specific aspects of the MHIS need to be evaluated?
2. What perspective is needed, or is most useful?
3. Which research instrument is the most appropriate?

### **Task 3: Compare with the baseline assessment**

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The progress of the MHIS can be evaluated by comparing the most recent data with those established as the baseline. The purpose is to compare development for each of the stages of the MHIS over time.

### **Task 4: Determine the frequency of evaluations**

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As a general principle, it is important to conduct periodic evaluations of the MHIS. The frequency of these evaluations will depend on such considerations as the availability of resources, the difficulties encountered in the design and implementation of the system, and the complexity and scale of the system. As a way of maximizing resources, it may be useful to conduct routine evaluations at the same time as wider evaluations of the mental health system are done, for example as part of routine service planning evaluations.

## 4. Barriers and solutions in MHIS

Barriers	Solutions
<p><b>Stages of MHIS</b></p> <p><b>Collection:</b> Data collected is of poor quality and is duplicated. Common reasons are that health workers:</p> <ul style="list-style-type: none"> <li>(i) are overloaded with data collection</li> <li>(ii) see no use in data collection</li> <li>(iii) are not supplied with the data collection forms</li> </ul> <p><b>Processing:</b> A large proportion of the data collected pass to the national level without being used locally.</p> <p><b>Analysis:</b></p> <ul style="list-style-type: none"> <li>(i) Data remain unanalysed.</li> <li>(ii) Analysis often consists of simple aggregates which lack denominators or are inaccurate.</li> <li>(i) The aggregation of data at higher levels often prevents data from being sufficiently specific to enable appropriate local action.</li> </ul>	<ul style="list-style-type: none"> <li>(i) Sharpen policy and regulations to allow collection of simple, but carefully selected data, with an emphasis on ease of collection.</li> <li>(ii) Regulations and legislation should ensure data collection through a “stick and carrot approach”.</li> <li>(iii) Identify areas of duplication.</li> <li>(iv) Prioritize collection and processing of data in the most efficient manner.</li> <li>(v) Exclude all data that are not absolutely necessary.</li> <li>(vi) Ensure that case-level data are useful for clinical practice.</li> <li>(vii) Conduct training sessions on how to collect data and on how data will be used.</li> <li>(viii) Provide shorter and fewer forms, and ensure their adequate supply.</li> <li>(ix) Create a national health index number, which is a unique identifier allowing people to be counted only once, even when they access a range of mental health and alcohol and other drug services.</li> <li>(i) Enable more local processing and analysis of data, through local training and local allocation of resources.</li> <li>(ii) For wider data management problems, conduct a situation analysis of the system (if necessary a “walk-through” analysis) to examine causes of poor data management and to identify solutions.</li> <li>(i) Ensure streamlining of analysis through emphasis on a minimum data set, and selection of only the most essential indicators.</li> <li>(ii) Assure adequate resources for analysis, in terms of: (a) personnel, which requires planning for training of staff to ensure that they have analytic competencies, clear job descriptions and support systems; and (b) equipment (software and hardware with adequate support systems).</li> <li>(iii) Provide locally specific information by disaggregating data sent from the central level, or by local analysis.</li> </ul>

**Dissemination:**

- (i) Peripheral services rarely receive feedback on the data reported to the higher levels.
- (ii) Oversupply of inappropriate and poorly presented data.

**Use:**

- (i) Information may be available but is not used.
- (ii) There is a lack of sharing and coordination of information within the health sector
- (iii) There is a lack of sharing and coordination of information between sectors.

**Resources:**

- (i) Information systems are often overcentralized.
- (ii) Often, insufficient resources are allocated to information systems

**Rules:**

Health workers rarely receive standardized instructions on how to collect data, and receive little, if any, training in data collection methods.

- (i) Plan the resources of the MHIS to allow regular feedback at monthly, quarterly and annual intervals.
- (ii) Carefully select only essential indicators and place emphasis on a minimum data set.
- (iii) Emphasize the need for well presented data.
- (iv) The results should be disseminated to allow stakeholders to discuss the implications of the results in relation to service delivery improvements and planning.

- (i) Present information simply and attractively (for example, with a view to suitability of placing it on the walls of most peripheral clinics).
- (ii) Training should be provided at all levels (in particular managerial level) on how to use the information.
- (iii) Develop and reform the MHIS in coordination with the general HIS and other sectors.
- (iv) Identify ways of presenting information which will advance equity and accountability.

Balance resource centralization (to meet efficiency and overall coordination needs) with decentralization (to enable some analysis of data at the local level).

Plan to provide standardized instructions and training.

<sup>1</sup> A useful example is provided from experience in Papua New Guinea. Cibulskis & Hiawalyer (2002) state: "A promising initiative has been to summarise health statistics according to parliamentary constituencies and ensure their widespread circulation. This is not only of interest to health managers but also to a wider audience who wish to see accountability among public servants and politicians."

## General aspects of MHIS

Information is more often about hospital contacts than community service contacts, even though mental health services are increasingly community-based. This often causes a historical time lag in the development of information systems (Thornicroft & Tansella, 1999).

Information is more often event-level than case-level (e.g. stating number of admissions per year, rather than characteristics of individual users admitted) (Thornicroft & Tansella, 1999).

The MHIS does not provide information that indicates whether policy is being implemented

Monitoring mental health services in an integrated health service is a problem. Specifically, it is often difficult to isolate mental health indicators and to request general health workers to devote time to the collection of mental health data. For example, it may be difficult to monitor mental health activity among general health nurses at the primary care level.

- (i) Develop community service indicators.
- (ii) Ensure compatibility between hospital- and community-based information systems; for example, in Germany a non-hospital-based mental health service information system (BADO-K) has been developed for local level services, which is compatible with that used within hospitals (BADO) (Kluge et al., 1999).

Develop case-level information systems that make information available on user characteristics, diagnosis and intervention(s) used.

Carefully design the MHIS to include indicators that measure policy implementation (e.g. if deinstitutionalization and community service development is a policy objective, use indicators that measure bed numbers, admissions, discharges and utilization of community services).

- (i) Select only the most essential mental health indicators for the minimum data set, in close coordination with general HIS (e.g. number of mental health contacts per day, or number of mental health trained nurses in primary care clinics). The specification of these data needs to be followed up with quality checks with regard to mental health data collection, processing, analysis, use and dissemination.
- (ii) Training of general health nurses in mental health care should include training in data collection and monitoring.

## 5. Conclusion

Information is crucial for decision-making at all levels of the mental health system. It is used by policy-makers to help them make the best use of scarce resources, by planners for the design of more efficient and effective services, by managers for the monitoring and evaluation of services and by clinicians to provide appropriate, good quality, evidence-based care. In a context of limited resources, increasing decentralization and changes to the financing of mental health care, the quality of this data is becoming even more important.

This module provides a four-step framework for an MHIS: needs assessment, situation analysis of the current MHIS, implementation of the new system and evaluation. Although specific step-by-step guidance is provided, it is important that countries adapt this guidance to their own circumstances. Countries will need to adjust their expectations to their current resources, without compromising the quality of the system or the essential data that are needed. There are few quick solutions and long-term investment will be required. To assist countries with these decisions, Annex 1 refers readers to a suggested set of mental health indicators recently developed by WHO.

The following quotation summarizes some of the key recommendations of this module:

“While information systems often involve such an effort that any thought of repeating the effort is discouraging, it is important to think of the system as a living thing that will grow and change or may die. When the system is in its infancy, it is best to start with a small data set, bearing in mind that all such data sets and the forms used to collect them are compromises among those who do the work. Inevitably there will be some who will be interested in gathering data items that others will find burdensome. Agreement is easier to reach if one appreciates that ‘perfect is the enemy of good.’ The system must be flexible and users should anticipate adding other items as capabilities increase. With top-down and bottom-up planning the subgroup that monitors the implementation of the system should meet regularly to monitor how the system is going, changing its membership as desirable according to where there are particular problems or benefits, noting what reports are useful or need to be developed. If the system is not computerised, it probably will be so eventually, as the computing costs continue to decrease while availability increases. No information system is ever finished.” (Zebulon Taintor, personal communication)

*Information is crucial for decision-making at all levels of the mental health system.*

*This module provides a four-step framework for an MHIS: needs assessment, situation analysis, implementation and evaluation.*

## **Annex 1. A WHO instrument to assess mental health systems and services at country level**

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Health authorities in countries need information to help them decide what actions to take to improve mental health services in specific areas. To facilitate decision-making, an instrument – World Health Organization Assessment Instrument for Mental health Systems (WHO-AIMS 2.1) – has been developed, that provides essential information on the mental health system of a country or region (WHO, 2005). WHO-AIMS 2.1 is based on the ten recommendations of the World Health Report 2001 (WHO, 2001). These recommendations are:

1. Provide treatment for mental disorders in primary care
2. Ensure wider accessibility to the essential psychotropic drugs
3. Increase the treatment of individuals with severe mental illnesses within community psychiatric services
4. Provide public education on mental health
5. Involve communities, families and consumers in mental health care
6. Establish national policies
7. Establish programmes and legislation on mental health
8. Develop appropriate human resources
9. Link the mental health system to the other health and non-health sectors
10. Develop information and monitoring mechanisms and support relevant research.

For each recommendation of the World Health Report (domain of interest), items were generated and grouped together in a number of facets (subdomains). Experts and key focal points from resource-poor countries provided inputs to ensure the clarity, validity and feasibility of the items. An earlier version of the instrument was released and tested in 12 resource-poor countries. These countries were selected based on regional diversity and size, and included countries from all the WHO Regions. The instrument was revised and shortened based on feedback from the pilot study as well as expert rankings of the importance of each item for planning public mental health action in low- and middle-income countries. In addition, each item was rated on the extent to which it is meaningful and feasible. The revised instrument was then presented at a WHO meeting to 14 country representatives and key resource people. Several minor additions and revisions were recommended and were incorporated into the current version of WHO-AIMS 2.1. This version consists of six domains (covering the 10 World Health Report 2001 recommendations, with 28 facets and 156 items). The six domains are: policy and legislative framework, mental health services, mental health in primary health care, human resources, public education and links with other sectors, and monitoring and research. These domains are interdependent, conceptually interlinked, and somewhat overlapping. All six of them need to be assessed to form a relatively complete picture of a mental health system.

This instrument is being used by WHO for systematic baseline assessments to help countries make information-based plans, with achievable targets, to strengthen their mental health systems.

## **Annex 2. Country examples**

### **Example 1. Sample minimum data set recommended for inpatient services in Gauteng, South Africa**

<b>Category</b>	<b>Items</b>
Organization identifiers	
Patient identifiers and demographic information	Name, date of birth or age, gender, marital status, current employment status, housing/living arrangements, education, citizenship, language, religion
Administrative data	Admission and discharge dates, usual address, category of payment
Legal basis for admission	
Clinical data	Prior receipt of care, medical history, presenting problems, discharge diagnosis
Discharge data	Place of referral, guardian/person to notify
Event data	Date and time of event, event type, place of service and responsible clinician, staff member reporting, patient(s) involved, event programme and event identifier
Human resources/staff registry data	Name, gender, date of birth, speciality, educational and certification data

*Source: Lee & Dartnall, 1998*

**Example 2. Sample data capture form – Hospital admission form, Gauteng province, South Africa**

<b>Hospital</b> <input type="checkbox"/> Refer to coding on back page	<b>Ward</b> <input type="text"/>
<b>Identifying information</b>	
<b>File number</b> <input type="text"/>	<b>ID number</b> <input type="text"/>
<b>Name of patient</b> <input type="text"/>	
<b>Address</b> <input type="text"/>	
<b>Address</b> <input type="text"/>	
<b>Post code</b> <input type="text"/>	<b>Health district</b> <input type="checkbox"/> Refer to coding on back
<b>Telephone</b> <input type="text"/> (home) <input type="text"/> (work)	
<b>Name of Next of Kin</b> <input type="text"/>	
<b>Please state nature of relationship</b> _____	
<b>Address</b> <input type="text"/>	
<b>Address</b> <input type="text"/>	
<b>Post code</b> <input type="text"/>	<b>Health district</b> <input type="checkbox"/> Refer to coding on back
<b>Telephone</b> <input type="text"/> (home) <input type="text"/> (work)	
<b>South African Citizen</b> <input type="checkbox"/> 1= yes 2=no If no, please state where citizen: _____	
<b>Demographics/History</b>	
<b>Sex</b> <input type="checkbox"/> 1=male 2=female	<b>Date of birth (ddmmyyyy)</b> <input type="text"/>
<b>Marital status</b> <input type="checkbox"/> 1=Never married, 2=Married/living with partner, 3=separated/divorced, 4=widowed, 9=other	
<b>Primary language</b> <input type="checkbox"/> 1=English, 2=Zulu, 3=Sotho, 4=Afrikaans, 5=Tswana, 6=Tsonga, 7=Venda, 8=Xhosa, 9=Pedi, 10=Shangaan, 11=Swazi, 12=Other	
Religion: (please specify) _____	
<b>Personal characteristics</b>	
<b>Employment status</b> <input type="checkbox"/> 1=working (incl sheltered workshop), 2= working (protected workshop), 3=not working	
<b>Housing</b> <input type="checkbox"/> 1=In household alone 2=In household with relatives or others 3=In chronic care Institution	4=Hostel 5=Halfway house 6=No known res. 9=Other
<b>Education</b> <input type="text"/>	00=No formal 02=Less than std 6 03=Std 6-7 04=Std 8-9 05=Matric
	06=Tertiary education 07=School for people with disabilities 08=Technical training 99=Other
<b>Current Episode Information</b>	
<b>Admission information</b>	
<b>Admission date (ddmmyyyy)</b> <input type="text"/>	<b>Legal status</b> <input type="checkbox"/> 1=Vol (by consent C3;C4) 3=State 2=Invol (9,12) 4=Obs 9=Other
<b>Payment source</b> <input type="checkbox"/> 1=Personal/family, 2=Health insurance, 3=None, 9=Other	
<b>GAUTENG Referral source</b> <input type="text"/>	01=Self/family/ Friend 02=Gen hosp 03=Health practitioner/clinic
	04=School 05=Welfare agency 06=Priv sector 07=Crim justice 08=Lifecare 99=Other
<b>OUTSIDE PROVINCE Referral source</b> <input type="text"/>	01=Self/family/ Friend 02=Gen hosp 03=Health practitioner/clinic
	04=School 05=Welfare agency 06=Priv sector 07=Crim justice 08=Lifecare 99=Other

**Example 3. Sample data capture form – Hospital discharge form, Gauteng province, South Africa**

<b>Hospital</b> <input type="checkbox"/> Refer to coding on back page	<b>Ward</b> <input type="text"/>
Identifying information	
<b>File number</b> <input type="text"/>	<b>ID number</b> <input type="text"/>
<b>Name of patient</b> <input type="text"/>	
<b>Discharge Address</b> <input type="text"/>	
<b>Address</b> <input type="text"/>	
<b>Telephone</b> <input type="text"/>	<b>(home)</b> <input type="text"/> <b>(work)</b> <input type="text"/>
<b>Date of discharge (ddmmyyyy)</b> <input type="text"/>	<b>Discharge Type</b> <input type="checkbox"/> 1=Discharged – treatment complete <input type="checkbox"/> 2=Discharged – against medical advice <input type="checkbox"/> 3=Death <input type="checkbox"/> 4=Transfer <input type="checkbox"/> 5=Conditional LOA <input type="checkbox"/> 9=Other
<b>Date of admission (ddmmyyyy)</b> <input type="text"/>	<b>Length of Stay (days)</b> _____
Continuity of Care Details	
<b>Pt Discharged for F/up to:</b> <input type="text"/> 01=Comm. MH Clinic 02=PHC 03=Pte Sector Care 04=Lifecare 99=Other	Please provide FULL contact details of where patient has been discharged to: <b>Contact person:</b> _____ <b>Organisation Name:</b> _____ <b>Address:</b> _____  <b>Phone:</b> _____ <b>Fax:</b> _____
Diagnosis/Medications	
<b>Discharge Diagnosis (DSM-IV)</b>	<b>Medications to Avoid (e.g., Allergies, side-effects, failed treatments)</b>
Axis I	
Axis II	
Axis III	
Axis IV	
Axis V	
Treatment at Discharge	
DRUG	DOSE

### **Annex 3. Using non-routine and routine data collection methods**

#### **Using non-routine data collection, together with some routine data collection, methods for mental health service planning in Gauteng province, South Africa.**

(This report was prepared by Dr Rita Thom, a psychiatrist working in the provincial head office, for the Gauteng Health Department).

The following example from South Africa illustrates the use of non-routine data collection methods, together with some routine data sources, when the routine HIS was not able to deliver the information required for mental health service planning.

Four aspects are covered:

- Instructions for completing report forms
- Report form for Community Mental Health Services
- Report form for Child and Adolescent Mental Health Services
- Summary of the report's findings

#### **Instructions for completing report forms**

##### **Community Mental Health Services:**

Numbers of active patient files on clinic register: Over the period, 1 April to 30 September 2001.

Defaulter rate:

Number of patients who fail to keep an appointment in a month/number of patients seen at the clinic in a month x 100.

For example, 15 patients failed to keep an appointment in the month of April; 88 patients were seen in the month of April:  $15/88 \times 100 = 17.04\%$

For clarity, please complete child and adolescent clinics separately from adult clinics.

##### **Child and Adolescent Mental Health Services:**

(TMI, CH Bara, Tara-Alex CAFU, Weskoppies Hospital Child and Adolescent OPD services)

Numbers of active patient files on clinic register: Over the period 1 April to 30 September 2001.

Number of patient contacts in each month: From daily total headcount

**REPORT ON MENTAL HEALTH SERVICES IN GAUTENG  
OCTOBER 2001  
DISTRICT HEALTH SERVICES: COMMUNITY MENTAL HEALTH SERVICES**

NAME OF CLINIC:		Professional nurse in charge of service:					
Numbers of active patient files on clinic register		Adults			Children		
Staffing: Number of each profession/category (in full time equivalents) NB: Clinical staff only							
Psychiatrists	Registrars	Medical Officers	Professional nurses	Psychologists			
Occupational therapists (OT)	Social workers	Nursing assistants	Mid-level workers (e.g. OT assistants)	Interpreters			
Defaulter rate:	April	May	June	July	August	September	
Referral rate from PHC:	April	May	June	July	August	September	
Achievements in the last 6 months (April to September 2001):							
Problems encountered in the last 6 months (April to September 2001) (and action taken to resolve problems):							

**REPORT ON MENTAL HEALTH SERVICES IN GAUTENG  
OCTOBER 2001  
CHILD AND ADOLESCENT MENTAL HEALTH SERVICES**

NAME OF UNIT:									
<b>Staffing:</b> Number of each profession/category (in Full Time Equivalents) NB: Clinical staff only									
Psychiatrists		Registrars	Medical Officers	Professional nurses	Psychologists				
Occupational therapists (OT)		Social workers	Nursing assistants	Mid-level workers (e.g. OT assistants)	Interpreters				
Number of active patient files, April to September 2001				Number of new patients seen, April to September 2001					
Number of patient contacts:		April	May	June	July	August	September		
Achievements in the last 6 months (April to September 2001):									
Problems encountered in the last 6 months (April to September 2001) and action taken to resolve the problems:									

## **Summary of Report on Mental Health Services provided by the Gauteng Health Department**

### **Introduction**

The following report is a compilation of various sources of information on mental health services in Gauteng in the year 2001 (population: 8 030 406).

- Some information has been obtained from the District Health Service Minimum Data Set.
- In addition, in November 2001, questionnaires were sent to all mental health services in order to try and capture important and useful information for the planning and monitoring of these services.
- A review of child and adolescent mental health services in the District Health Service was also undertaken in 2001.

Note: this summary of the report only covers community mental health services and child and adolescent mental health services, and does not address specialist psychiatric institutions or general hospitals.

### **1. Community mental health services**

#### **1.1 Primary mental health care**

There is no information available on the extent to which primary mental health care services are being provided in Gauteng. The only information we have is from the Minimum Data Set, which indicates the following (April 2000 to March 2001):

- Percentage of newly diagnosed patients with mental illness: 0.16%
- Percentage of chronic stable patients with mental illness down-referred from secondary level to primary level: 1.3%

National and international prevalence studies indicate that the prevalence of mental illness in PHC settings is of the order of 10% of all patients presenting in these settings. National policy indicates that 80% of all people with mental health problems should be managed in PHC settings. These figures indicate how far we are from this goal in Gauteng Province.

## 1.2 Secondary level community mental health services

District	Central Wits	West Rand	Ekurhuleni	Sedibeng	Pretoria/Tshoane/Cullinan/Bronkhorst spruit	Total /National norms
Secondary level mental health clinics	20	13	11	7	22	73
Child services	3	4	2	4	5	18
Number of active patient files on clinic register	11684 <sup>1</sup>	4461	3503	2787	4752	24400
Daily patient visits (DPV) (no. of patients visiting clinics on an average day)	584	223	175	139.4	237.6	
Professional nurses: DPV	0.06	0.035	No information available	0.07	0.075	0.2 to 0.54
Doctors: DPV	0.01	0.018	0.02	0.03	0.02 <sup>2</sup>	0.04 to 0.08
Allied medical staff: DPV	0.008	0.008	0.03	0.01	0.008 <sup>3</sup>	0.06 to 0.31
Defaulter rate (%)	6.40	8	7.65	10.9	3.76	8 to 11
Referral rate from PHC (%)	0.56	0.70	No information available	No information available	3.42	No national norms

Notes: Figures falling outside the range of national norms are highlighted in bold

1. Information is incomplete. Only obtained from 13 out of 20 clinics.
2. Most of the medical staff come from Weskoppies (region does not pay).
3. Allied medical staff provide services for physically and mentally disabled people (85% and 15% respectively).

Information from the DHS Minimum Data Set shows a total annual headcount of 189 143 at all secondary level mental health clinics. This is an average monthly headcount of 15 761. Most patients attend clinic once a month, and so this should also be an indicator of the number of active patient files. There is a large discrepancy between the head-count figures in the MDS (15 761) and the active patient files in the information obtained directly from the clinics (24 400). Possible reasons include: inadequate completion of MDS forms, high defaulter rates and incorrect information regarding active patient files.

### 1.3 Referral rate from PHC

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This is a useful indicator for assessing the extent to which integration of mental health into PHC is occurring. This is in addition to the indicators mentioned above, which are obtained from the PHC MDS (number of newly diagnosed patients with mental illness, and number of chronic stable patients referred to PHC for follow-up). There are data from only two regions.

1. REGION A		2. REGION C	
Central wits	West Rand	Pretoria/Bronkhorstspuit	
0.56%	0.70%	3.42%	

It is interesting to note the discrepancy in the referral rates between regions A and C.

### 1.4 Achievements

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Community Mental Health Services report:

- Slight improvements in allied medical staffing in some areas.
- Greater utilization of mental health services by different stakeholders, including other sectors.
- Increasing number of mental health promotion activities.
- Better working relationships with PHC.
- Decreased defaulting and relapse rates.
- Some support groups have been established in some clinics, and these are run by volunteers, with facilitation and input by the community psychiatric nurses.
- Improved relationships between pharmacy, psychiatric community and ward staff.
- New mental health NGO for adult psychiatric patients opened at Vereeniging with 12 beds.

### 1.5 Problems

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- Staff shortages in mental health. In addition to the ongoing staff shortages, particularly of medical and allied medical staff, a significant number of experienced psychiatric nurses have left the service (many having been recruited to work in the United Kingdom). This has left the Sedibeng District with 10 newly appointed, inexperienced professional nurses to run the majority of the clinics in this district. Other districts are not as badly affected, but this is a serious problem, and affects the morale of the remaining staff.
- Ongoing problems with the supply of medication to clinics. There is a complicated process for ordering and supplying medications, and delays in the pharmacy and in transporting supplies are common.
- Lack of access to mental health services in some areas. Patients have to travel long distances to clinics, and this contributes to defaulting and poor compliance.
- Resource problems. Ongoing problems with accommodation, communication (lack of telephones) and transport (for patients to hospital and for home visits).
- Inappropriate referrals to child mental health service by the Education Department.
- Difficulty getting patients admitted for acute inpatient care.
- Difficulties with relocation of Vereeniging clinic, leading to poor compliance and an increase in the defaulter rate.
- Lack of essential drugs list medications in PHC makes it difficult to down-refer patients.
- Problems with Emergency Services – lack of cooperation.
- Difficulty attending in-service training and conferences, due to staff shortages, and

facility managers not allowing staff to attend.

## **2. Child and Adolescent Mental Health Services**

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### **2.1 Tertiary level services**

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Child and family units: There are child and family units at Tara/Alex, TMI, Chris Hani Baragwanath Hospital and Weskoppies Hospital. Weskoppies Hospital also has an inpatient child and adolescent unit. These saw a total of 8 815 patient contacts over the six-month period, May to October 2001. This is equivalent to 35.26 daily patient visits (including patients who were admitted to the inpatient unit at Weskoppies, but excluding data from Garankuwa). The unit at Weskoppies Hospital is adequately staffed.

For the other three services (DPV = 33.75):

- Doctor: DPV = 0.19.
- Professional nurse: DPV = 0.32
- Allied medical staff: DPV = 0.31 (includes intern psychologists)  
(without interns = 0.19)

There are no national norms for child and adolescent services. These services require much more intensive professional-patient contact, particularly with nursing and allied medical staff. The doctor: DPV ratio is below the norm for adult ambulatory services. It is likely that these services are operating with less than the necessary staffing.

There are also inpatient adolescent units at Tara and Sterkfontein Hospitals. Staffing and patient statistics from these units are contained within the general statistics for these hospitals.

### **2.2 Secondary level services**

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There are also secondary level community child and adolescent mental health services within the District Health Services. The number of treatment points has increased over the last few years. Two qualified psychiatrists, who are training as child psychiatrists, staff most of the clinics in Southern Gauteng. However, please refer to the report below on the review of community child and adolescent mental health services.

### **2.3 Achievements**

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- A number of support groups for AIDS orphans and families affected by HIV/AIDS have been established at the Alexandra Children's clinic.
- The psychiatrist at Weskoppies has been registered as a child psychiatrist, and so can provide training in the sub-speciality of child psychiatry at Pretoria University/Weskoppies Hospital.
- There are plans to expand the community child and adolescent mental health services in the Pretoria region.

### **2.4 Problems**

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- Ongoing problems due to lack of staff.
- Ongoing problems with other sectors.
- Lack of contact and effective communication between sectors.
- Lack of inpatient beds for children in southern Gauteng. A 24-bed unit was built at CH Baragwanath Hospital, but this was subsequently made into an adult psychiatric ward. There are plans in the interim for conversion of another ward for children.

### **General achievements**

The major achievement of mental health services is that they have continued and survived despite major losses of staff, particularly experienced nursing staff. Some services have expanded (community child and adolescent mental health services). There has been better communication between primary and secondary level community services, as well as between hospital and community mental health services. A new unit has opened at Natalspruit Hospital. A computerized health information system has been established at Weskoppies Hospital.

### **General problems needing urgent attention**

- Lack of experienced psychiatric nursing staff, especially in the Sedibeng District.
- Lack of inpatient child psychiatric beds in southern Gauteng.
- Better data collection from, and feedback to, all mental health services.

## Definitions

Note: An extensive list of mental health indicators is provided, along with definitions and formulae, in the WHO instrument to assess mental health systems and services at country level (Annex 1).

Capture	To store data in a computer (Pearsall, 1999).
Data	Raw facts in the form of numbers, letters and codes which in themselves have little meaning (Smith, 2000).
Evaluation	A process which attempts to determine the impact of an intervention in the light of its objectives (Sandiford, Annet & Cibulskis, 1992).
Face validity	The subjective judgement made by the user of the instrument about whether the individual items cover the appropriate range of problems relevant to the measure as a whole. This is not a statistical yardstick of validity so much as an initial impression about the degree to which the scale correctly includes relevant items (Thornicroft & Tansella, 1999).
Indicator	Measures which (i) summarize information relevant to a particular phenomenon; (ii) can be used to indicate or show a given situation; and thus (iii) can be used to measure change (Green, 1999).
Information	Processed data that appears in a context and conveys meaning (Smith, 2000).
Input	The resources that are put into the mental health care system (Thornicroft & Tansella, 1999). Inputs include human resources, finances, medication, facilities and equipment.
Monitoring	The ongoing or routine measurement of the performance of an intervention in progress (Sandiford, Annet & Cibulskis, 1992).
Need	The ability to benefit from care (Thornicroft, 2001).
Outcome	The effect of the service on the mental health of the population being served.
Process	Activities of the service, including the way in which care is delivered.
Reliability	The extent to which an instrument consistently measures a variable (Bodart & Shrestha, 2000).
Sentinel sites	Sites where information is gathered in more detail than would happen routinely in the established MHIS.
Surveillance	The ongoing and systematic collection, analysis and interpretation of health data in the process of describing and monitoring a health event (Klaucke et al., 1998).
Validity	The extent to which an instrument measures what it is intended to measure (Bodart & Shrestha, 2000).

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