CHAPTER 48

Monitoring and evaluation

ILLUSTRATIONS

COUNTRY STUDIES

SUMMARY

Monitoring refers to the ongoing review of the progress toward completing program activities and achieving objectives. It allows corrective action during program implementation. Monitoring systems focus on inputs and short-term outputs and should be an integral part of day-to-day management.

Fully developed monitoring systems, which may be established in phases, typically consist of a combination of four methods—

1. Supervisory visits for continual, informal monitoring of workplan implementation and progress toward program plans
2. Routine reporting of selected data through the pharmaceutical management information system (PMIS)
3. Sentinel sites for more detailed reporting when new initiatives or rapid expansion requires more intensive monitoring
4. Special studies whenever an implementation problem or planning question requires specific additional information

Performance indicators can facilitate tracking a program's progress toward established performance targets or milestones and help compare this progress to that of other programs. Indicators should meet the criteria of clarity, usefulness, measurability, reliability, and validity, as well as acceptance by key stakeholders.

To be effective in improving program performance, monitoring requires—

- Clear communication of plans and targets
- Regular review and sharing of monitoring results
- Follow-up to provide feedback and take corrective action

Evaluation is commonly discussed along with monitoring as part of an overall strategy. It refers to the periodic analysis of a program's progress toward meeting established objectives and goals. Evaluations fall into three categories, which differ in timing and purpose—

- Needs assessment (situation analysis, see Chapter 36)
- Formative evaluation (midterm review)
- Summative evaluation (final evaluation)

Evaluations use data collected through the ongoing monitoring system, supplemented by document review, interviews, additional data collection, and field surveys using standard pharmaceutical assessment indicators. Strategies for monitoring and evaluation are normally developed in parallel to ensure a comprehensive, unified evaluation strategy.

48.1 Definitions of monitoring and evaluation

Monitoring refers to reviewing, on a continuous basis, the degree to which program activities are completed and performance targets or milestones are being met. Typically, monitoring focuses on tracking program inputs such as funding, staff, facilities, supplies, and training. As such, monitoring is part of the operational management of a program. Monitoring also tracks outputs such as availability of medicines and supplies, number or percentage of trained staff, and quality of services. Systematic monitoring of inputs and outputs can help identify potential problems and corrective actions to be taken during program implementation.

Evaluation refers to analyzing progress toward meeting established objectives, goals, or results. It provides feedback on the outcomes of activities, such as changes in prescribing behavior and health care–seeking behavior, whether plans have been met, and the reasons for success or failure. Evaluation should also provide direction for future programmatic plans. Evaluation methods may be used to carry out a situation analysis or a needs assessment as the first step in designing an appropriate intervention to improve program performance. Evaluation takes a longer-term perspective and concentrates on the strengths and weaknesses of the program strategies.

Country Study 48-1 illustrates the monitoring and evaluation system put into place for pharmacy and laboratory services in a new antiretroviral therapy (ART) program in Kenya.

This chapter is concerned mostly with monitoring pharmaceutical supply systems. Monitoring is closely linked with the pharmaceutical management information system, described in Chapter 49. Evaluation, which is closely linked with systematic assessment (Chapter 36), is discussed briefly at the end of this chapter.

48.2 Monitoring issues

Systematic and ongoing monitoring is essential for ensuring that program performance is on track, for improving performance, and for achieving long-term program goals and results. Unfortunately, during program implementation, attention can easily get focused on specific technical activities at the expense of monitoring activities. Too often, monitoring is done casually, without a clear plan, without a

clear link to program objectives and targets, and without any effort to use monitoring results to improve program performance.

Monitoring should be an integral part of the day-to-day management of pharmaceutical supply systems. Managers of pharmaceutical supply programs are concerned with getting the most out of scarce resources. Meeting this goal means making the program as efficient and as effective as possible. Therefore, managers need to generate current, reliable information to use in making decisions on program performance and operations.

The monitoring system should center on key program activities and objectives. To operate efficiently, it must focus on a small number of specific, clearly formulated monitoring issues that are directly related to performance and are generally taken from program plans, objectives, and targets.

Monitoring is intended to—

- Determine whether activities are being carried out as planned
- Measure achievement of targets
- Identify implementation problems to initiate corrective action
- Identify and reinforce good performance
- Identify and strengthen weak performance
- Help target supervision toward problem areas
- Assess whether activities are having their expected effect
- Assess long-term trends
- Contribute to reviewing and revising program priorities and plans

Funding agencies and donors may impose their particular reporting requirements for their own monitoring and reporting purposes. For the most part, these reporting requirements do not deviate much from standard reporting needs. The advent of international funding initiatives, such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, has been accompanied by increased attention to the issue of ensuring accountability in the use of funds and achievement of program goals (see References and Further Readings). Unfortunately, specific reporting requirements, performance indicators, and targets may differ significantly between donors and funders, thereby increasing the monitoring and reporting burden of funding recipients.

Ultimately, monitoring is meant to improve the long-term performance of the program and individual staff members.

48.3 Monitoring methods

How are monitoring activities organized, and where does monitoring information come from? Information required for monitoring can be obtained through a combination of four formal and informal methods: supervisory visits, routine reporting, sentinel reporting systems, and special studies.

Supervisory visits

Supervisory visits support the performance of individual staff or health care workers, provide some on-site, in-service training, and represent an important method for informal but direct monitoring of program implementation (see Chapter 51).

Supervisory visits should reinforce routine reporting requirements. Such visits may include checking the quality of entries on standard reporting forms, such as inventory management forms (for example, stock cards). Visits sometimes involve the collection of information, such as the availability of specific medicines, for special studies.

Routine reporting

The core of a monitoring system for pharmaceutical supply programs is the routine reporting that is accomplished through the pharmaceutical management information system. A PMIS consists of record-keeping documents; data reporting forms; feedback reports; and procedures that govern the availability, use, and flow of information up and down the system, including tracking the availability and use of medicines.

Chapter 49 provides a practical overview and specific guidance on designing an effective PMIS. It emphasizes the need to build on existing recording and reporting systems, to involve users in developing the system, to use appropriate data collection methods, to integrate the PMIS with other information systems, to take advantage of practical analysis methods, and to communicate information promptly and clearly.

Depending on the program's objectives, routine reporting focuses on the availability of supplies at different levels in the system, finances, procurement and supplier performance, training, quality assurance, and medicine use. Clear presentation of reported information, feedback to those providing the information, and follow-up action contribute to the effectiveness and usefulness of the reporting system. Reports should include both quantitative information and brief descriptions of processes, key problems, and proposed follow-up actions. Some countries are now using mobile telephones to transmit routine monitoring data to a central location for timely analysis or even analyzing data at remote locations. For example, the National Malaria Control Program in Malawi is using a mobile phone–based tool to collect and analyze data on malaria commodity availability and case management indicators during supervisory visits to facilities. This method allows supervisors to identify and address problems quickly.

Country Study 48-1
Developing a monitoring and evaluation component for a new ART program in Mombasa, Kenya

In countries that are introducing and scaling up ART programs, a challenge is improving ART access quickly while at the same time working to strengthen systems that support long-term quality care. In 2002, the government of Kenya, with technical assistance from various partners, initiated an ART program in four health facilities in Mombasa. The overall goal of the Mombasa ART program was to reduce HIV/AIDS-related morbidity and mortality and to improve the quality of life of people living with HIV/AIDS and their families in the Mombasa district. The program's specific objectives were to—

- Improve the capacity of HIV/AIDS clinics, laboratory, and pharmacy services in selected public health facilities in Mombasa to provide HIV/AIDS comprehensive care, including ART
- Provide ART to 300 patients over a period of five years in accordance with eligibility criteria
- Sensitize communities and strengthen support groups' knowledge of comprehensive HIV/AIDS care, including ART

A monitoring and evaluation system was incorporated into the program design to provide quality information to help decision makers take timely corrective actions and ensure that the program is achieving its goal and objectives.

The key features of the system were to—

- Encourage analysis and use of information by using well-defined indicators rather than *only* reporting. The system stresses the use of data at the point where data are collected.
- Monitor all aspects (input, process, output, and quality) of the program, including support systems (for example, availability of human resources and enhancement of their capacities).
- Build on the existing information system to minimize the additional burden on service providers.
- Integrate feedback mechanisms at all levels.
- Ensure system simplicity to facilitate staff training on its modification and use.
- Make sure the system is functioning manually before computerizing it.

The diagram opposite illustrates the processes and timing of the monitoring and evaluation system throughout the life of the program (five years).

Baseline status: Result of the pre-implementation assessment formed the baseline status.

Activity monitoring: Pharmacist and laboratory staff responsible for the ART program monitored the activities during the week and reported to their supervisors at the end of *each week.*

Supportive auditing: At the *end of each month,* the supervisor, together with the respective responsible staff members, performed an audit of the activities and resources and discusses problems and solutions.

Review with pharmacy/laboratory technical partner: At the end of each quarter, all staff related to ART (pharmacy and laboratory) and technical partner staff jointly reviewed the activities and progress and discussed problems and solutions. Quarterly indicators were used as a basis for discussion.

The biggest failures in routine reporting systems are overdesign and underimplementation. Collecting too much data usually results in too little analysis. Also, reporting systems that are overly complex result in poor compliance with reporting requirements. Implementing an information system takes time and money. Moreover, the more complex the system is, the greater is the need for qualified and trained staff, time, and money to make it function.

Therefore, the content of routine reporting systems should be limited to the minimum amount of information that the typical reporting unit can reasonably be expected to provide and that can routinely be analyzed for decision making and feedback purposes. Identification of key data requirements is the result of a prioritization exercise that considers the critical information needs of all components of the pharmaceutical supply cycle. The simple rule is: do not collect what you cannot use.

Sentinel reporting systems

When routine reporting systems are properly collecting only the minimal essential information, a great deal of potentially useful information is not included. To supplement routine reporting, sentinel reporting systems can be useful.

A sentinel reporting system consists of a carefully selected sample of health facilities or dispensaries that are given greater recording and reporting responsibilities. For example, in a country with forty districts, six districts may be selected as sentinel districts. Within each district, a sample of health facilities from each level may be selected. Sentinel

Review with all technical partners: All technical assistance partners participated in the biannual review. Quarterly indicators were used as a basis for discussion.

Midterm evaluation: The technical partner conducted a midterm review of activities related to pharmacy and laboratory and also participated in the midterm evaluation jointly conducted by all the partners with the Kenyan Ministry of Health (MOH). Quarterly indicators were used as a basis for discussion.

Final evaluation: The pharmacy/laboratory partner conducted a program-end review of related activities and participated in the final evaluation jointly conducted by the other technical assistance partners and the MOH.

Source: Bhattarai and Walkowiak 2005.

	Weeks	1	2	3	4	1	2	3	4	1	2	3	4	…	1	2	3	4	…	1	2	3	4	…	1	2	3	4
Processes	**Months**	**1**				**2**				**3**				…	**6**				…	**30**				…	**60**			
Baseline status		▪																										
Activity monitoring		▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪		▪	▪	▪	▪		▪	▪	▪	▪		▪	▪	▪	▪	
Supportive auditing				▪				▪				▪					▪					▪					▪	
Review with pharmacy/laboratory technical partner												▪					▪					▪					▪	
Review with all technical partners																	▪										▪	
Midterm evaluation																						▪						
Final evaluation																											▪	

reporting differs from routine reporting in the amount of information collected, the frequency or promptness of report submission, and the level of accuracy demanded.

Sentinel reporting is common in disease control programs such as HIV/AIDS prevention, control of diarrheal disease, and treatment of sexually transmitted diseases. Sentinel sites provide a relatively economical means of collecting up-to-date, detailed information on disease incidence, antimicrobial resistance, and responses to program interventions.

Need for sentinel reporting. A sentinel reporting system is most useful when a system is undergoing rapid or substantial change, such as when a new treatment or public health intervention is being introduced. Sentinel reporting helps assess the implementation and short-term effect of changes or interventions such as—

- Introduction of a major new computerized stock management system
- Transition from a central medical stores system to a decentralized system
- Introduction or scale-up of a treatment program, such as ART or artemisinin-based combination therapy

Sentinel reporting is particularly important for new or expanded HIV/AIDS treatment programs where donors may have many new record-keeping requirements and where many unknowns may exist regarding how the patients will be integrated into the health system. Policy makers and managers can recognize and react more quickly to unexpected or undesirable issues related to program implementation, and information on the availability of antiretrovirals, patient adherence to medication regimens, and other key variables may be collected and rapidly reported.

Whereas the routine reporting system answers only the questions it asks, a sentinel reporting system can be useful to detect unexpected or unintended outcomes. However, recording and reporting formats developed for sentinel sites sometimes prove sufficiently useful and convenient to be incorporated into routine reporting.

Selection of sentinel sites. The level and number of health units in a sentinel system depend on the organization of the health and pharmaceutical management systems, the monitoring objectives, and the overall diversity within the country. If, for example, a country has only one central medical store and a handful of regional stores, they would all be included in sentinel reporting requirements. Generally, at least six units should be included within each level. For example, a sentinel system could include six districts, six district hospitals, and six health centers within each district (thirty-six health centers total). Larger numbers of units are needed in more populous, more organizationally complex, or more diverse countries.

Selection of specific districts, locations within districts, or health facilities is generally purposeful, not random. Selection is aimed at achieving diversity rather than statistical representativeness. The selected sites should represent the range of facilities that serve culturally, linguistically, and geographically diverse groups; the distribution of ministry and nongovernmental facilities; and accessibility.

Staffing levels at sentinel sites should be sufficient to handle additional recording and reporting requirements, which may mean hiring extra staff at some sites. Extra incentives are sometimes given for prompt, complete, accurate reporting, although this practice should be avoided. Prompt feedback of information can be sufficient to motivate staff to respond quickly and reliably. Because cost is a consideration, relatively inaccessible sites are usually chosen as sentinel sites, even at the price of omitting cultural or geographic diversity; however, if these inaccessible sites are particularly likely to suffer shortages of medicines and delayed delivery, including some of them in the sentinel system may be worth the effort, especially if there is an intent to make changes in the system to address these deficiencies.

Information required from sentinel sites. Sentinel sites may differ in the amount of information recorded, the amount of information routinely reported, or the speed at which the information is processed. Additional recording and reporting requirements should be based on the reasons that the sentinel system was established, such as monitoring a new stock management system, assessing transition to a supply agency system, or evaluating the effect of a user-fee program.

Most of the principles used in designing a PMIS apply to sentinel reporting: being selective in deciding which indicators to collect, choosing appropriate data collection methods, and building on existing recording and reporting systems whenever possible. In some instances, putting in computers at sentinel sites may be appropriate (or choosing sites that already have computer capability), even if national computerization is not currently foreseen.

Working with sentinel sites. Establishing a system of sentinel sites nearly always requires training key staff at the sites and making frequent supervisory visits, especially in the beginning. Sites may require additional forms, registers, stock records, and other materials.

Finally, a system of sentinel sites is generally maintained for a specified period of time, perhaps for the first several years of a transitional program. After that, these sites may revert to normal reporting status.

Special studies

Sometimes managers and planners need to gather information that is not available from routine or sentinel reporting. Examples of topics that may warrant a special study include—

- Names, dosage forms, and values of medicines purchased by individual health units
- Names, dosage forms, and value of recently expired medicines
- Reasons for expiration of pharmaceuticals
- Average percentage of essential medicines available
- Level of patient adherence to prescribed treatment
- Level of prescriber adherence to standard treatment protocols

Facility or population-based survey and research methods are typically used to obtain this type of information. These methods may involve expenses that are not considered in regular recurrent operating costs and may require specialists to design and carry out, but many questions can be answered with relatively simple methods and at little additional cost. For example, Chapter 40 describes how ABC analysis, lead-time analysis, expiry-date analysis, and pipeline analysis can help improve performance and reduce costs.

Both managers and staff should be involved in the design and implementation of these studies, as well as in the analysis and interpretation of results. However, it is also the manager's role to identify when additional information is needed and to use experts to help design and conduct these special investigations, so that resources are not wasted on a useless effort.

In-depth interviews, structured observation, focus group discussions, or other qualitative methods (see Chapter 28) can be used to explore behavior, attitudes, practices, and causal factors.

Rapid assessments are small-scale studies that include a survey of sample facilities, use of selected core indicators, and interviews with key informants. Rapid assessments typically are designed and conducted within one month (see MSH/RPM et al. 1995).

Country Study 48-2 describes how these four approaches were combined and how the system evolved for monitoring medicine and treatment fees in one East African country.

48.4 Designing the monitoring system

The principles for designing a monitoring system are to focus on key monitoring questions and indicators; keep data collection to a minimum; develop practical procedures for managing monitoring information; and consider the need to make comparisons between performance of similar programs, performance of different facilities within the program, and performance over time. Design should also consider how information will be available for timely feedback and follow-up action. The "KISS" concept should be applied: keep it simple and straightforward (or keep it short and simple).

When time pressures, financial resources, and staff members' inexperience with monitoring methods are limiting factors, phasing the design and implementation may make sense. Initial monitoring efforts can focus on issues of selection and procurement. Medical stores data, for example, are often easy to collect. As the program develops, the monitoring system and core indicators can be expanded to cover

medicine distribution and use. Regardless of the approach taken, the design of the monitoring system must be based on a sound understanding of how the system works, including the relationships between system inputs, outputs, and desired outcomes.

Managers can often benefit by designing a monitoring system that allows comparison of the performance of various health units or facilities. When a facility is introducing or phasing in a new activity, practice, or program, it can be matched to a control site that has not yet been introduced to the new practice or program. The control site should be as similar to the program site as possible, so that any changes can be more reliably attributed to the new program. If no control site is available to use as a comparison,

Country Study 48-2
Monitoring the introduction of medicine fees in Kenya

The Kenyan Ministry of Health introduced a new user-fee program. After early implementation problems, the ministry initiated a program of management improvement and regular fee adjustments. An outpatient medicine and treatment fee was introduced in phases. To assess the effect of the program—in particular the medicine treatment fee—a comprehensive monitoring system was implemented. The system consisted of targeted field supervision, routine reporting, a sentinel system of indicator districts, and special studies.

Targeted field supervision: Supervisory staff from the MOH health financing program made regular supervisory visits to each part of the country. Information from routine reporting and other sources was used to identify problem districts and problem facilities. These were visited more often. Gradually, the role of headquarters staff evolved from primary supervision (directly visiting districts and facilities themselves) to secondary supervision: teaching supervisory skills to provincial and district staff by making visits with counterparts.

Routine reporting: Routine reporting used the financial information system (FIS) and the health information system (HIS). The FIS was developed specifically for the user-fee program and consisted of reports from districts and hospitals covering collections, expenditures, insurance claims, exemptions, and bank balances. The existing HIS was adapted to support additional information needs of the user-fee system.

Indicator districts: The routine reporting system was kept to a minimum for reasons of feasibility, cost, and staff availability. Therefore, a system of six indicator districts was developed to provide additional details on the implementation of user fees. Districts were selected to achieve rural/urban and socioeconomic diversity. Specialized information gathering in the indicator districts included (a) outpatient use data from all MOH levels as well as selected mission and private facilities; (b) rapid household surveys before and after major fee changes to assess care-seeking patterns and knowledge of fees; (c) outpatient and inpatient surveys to assess patients' perceptions of the fee system and quality changes; and (d) a quality-of-care checklist to assess the availability of critical patient care inputs.

Special studies: During implementation, questions arose that could not be answered through either routine reporting or the indicator district system. Special studies were, therefore, conducted on the planning and expenditure process for the use of revenue; on fee preferences, to assist in expanding the fee schedule; on exemptions, to assist in adjusting exemptions to balance equity and revenue needs; and on revenue losses caused by non-collection of inpatient fees.

Uses of monitoring information: Supervision and routine reporting information were used to identify districts and facilities that were performing poorly and to strengthen their performance. Supervisory visits corrected misunderstandings of the new management systems. In some cases, staff members were intentionally flouting new rules for personal gain, and disciplinary action was taken. Districts and facilities that were performing well were identified and publicly recognized. Data from the indicator districts were used to guide decisions about the type, level, and timing of fee changes. Results from special studies were used to correct management problems and to revise management systems.

Evolution of the monitoring system: As the new user-fee system matured over a five-year period, the nature of the monitoring system evolved. Supervision was decentralized to the provincial and district levels. Routine reporting requirements were simplified to focus on the few critical FIS and HIS reports that most facilities could generate regularly. Data from indicator districts were important for monitoring major fee changes, but subsequent fee adjustments were having less and less effect, so little information was being gained from the indicator districts. Efforts were then concentrated primarily on effective local use of targeted supervision and routine reports.

Country Study 48-3
Using supervisory visits to improve medicine management in Zimbabwe

In Zimbabwe, training pharmaceutical technicians and health workers in medicine management resulted in significant improvements in inventory management and rational medicine use, but the achievements were not sustained. A monitoring program based on two supervisory visits every three months was instituted in district-level health facilities to determine whether progress in managing medicines could be maintained.

The study compared three different groups—

1. Twenty-three facilities receiving supervision on using standard treatment guidelines
2. Twenty-one facilities receiving supervision on inventory management
3. A control group of eighteen facilities receiving no supervision in either area

The evaluation measured performance using a range of indicators relating to medicine availability, use of stock cards and books, and monthly ordering, as well as adherence to the standard treatment guidelines.

The results showed that after supervision, overall inventory management and adherence to standard treatment guidelines improved significantly when compared with the control and comparison groups. In addition, supervisory visits had a positive effect on improving staff performance in other areas besides just inventory management and rational medicine use.

Source: Trap et al. 2004.

baseline data can be collected to use as a basis for assessing development after the program is started at the site. If more than one facility is initiating a program, the different facilities can serve as comparison groups to monitor how well each group is progressing. Country Study 48-3 details the effects of supervisory visits using both comparison and control groups.

48.5 Using indicators for monitoring and evaluation

Indicators are variables that measure change. They may be numerical and expressed in terms of numbers, percentages, or averages. They may also be expressed as binomials such as "yes" and "no." Indicators are useful tools for managers to track the performance of particular aspects or activities of the pharmaceutical supply system as well as the performance of the overall system. A well-defined indicator is clearly linked to an important input, process, or outcome. A well-selected indicator will help managers quickly identify potential problems in critical areas. Indicators are extremely helpful to communicate important performance gains and losses to other stakeholders of the pharmaceutical supply system. Indicators can be developed for different levels of the supply system.

Managers should be aware that well-established indicators exist for measuring the performance of the different components of the pharmaceutical supply system (for example, WHO 2007). However, because systems can be organized in different ways, managers should adapt or modify internationally recognized indicators to reflect the realities of their own system if necessary.

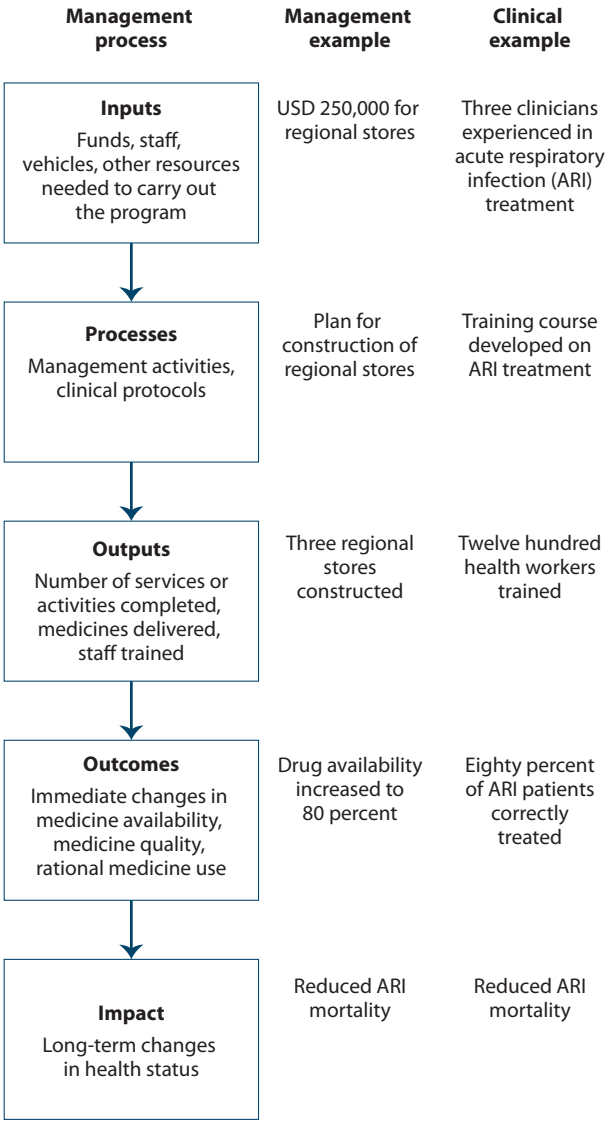
Applications of indicators

When used to make measurements at one point in time, indicators allow a manager to compare a program's performance with a target level of performance (or with another program's performance) and to identify areas of relative strength and weakness. Applied over time, such indicators can be used to set and monitor performance improvement targets, such as—

- Monitoring implementation of program plans and workplans
- Evaluating achievement of long-term goals
- Assessing the performance of individual units
- Identifying relative strengths and weaknesses in current policies and systems
- Measuring the effect of new policies or management systems
- Self-monitoring to improve performance
- Demonstrating needs to treasury, donors, or other funders
- Reporting on progress to senior officials, donors, or other interested parties

For program management purposes, whether at the national or facility level, performance indicators should tie directly to program plans and annual workplans and to a general performance improvement process. One way to view the management process is that it takes *inputs* (for example, human and financial resources, equipment, policies) and the implementation of certain management and clinical *processes* (meetings, trainings, development of materials) to create specific service or activity *outputs* (number of staff trained or clients served, new management system), which have immediate *outcomes* (change in practices, improved services), which lead to a desirable long-term *impact* on health status (change in disease rates, change in birth rates). This process is illustrated in Figure 48-1.

Figure 48-1 The health management process and illustrative indicators



Types of indicators

Indicators can be developed for each point in the health management process to monitor specific inputs, processes, and outputs associated with both management and clinical activities. Similarly, pharmaceutical supply system managers can identify input, output, and outcome measures for each major component of the pharmaceutical supply cycle. Table 48-1 lists commonly used indicators that correspond to the components of selection, procurement, distribution, use, policy, and management support.

Managers of pharmaceutical supply systems will note that many of their management activities focus on inputs such as financing, human resources, and the existence of policies and standard operating procedures. Examples of corresponding indicators include—

- Existence of a national medicine policy updated within the last three years
- Percentage of total health program budget dedicated to procuring pharmaceuticals

Managers are also concerned with activities or processes such as procurement, stock keeping, and prescribing and their outputs. Examples of related indicators include—

- Percentage of the pharmaceutical budget spent on essential medicines
- Average supplier lead time from order to delivery (in days)
- Average inventory turnover
- Number of prescribers trained on standard treatment guidelines

Important outcome indicators for pharmaceutical management focus on aspects of availability and affordability of key medicines, quality issues, and the appropriate use of medicines. Indeed, these indicators are typically the most visible and most commonly cited in evaluating how successfully a supply system is functioning. Examples of outcome indicators include—

- Average number of days of stockouts (of key medicines and supplies)
- Average number of items out of stock at a given point in time
- Average number of medicines prescribed to a patient for a given condition

Selecting indicators

Five necessary criteria for selecting appropriate performance indicators are—

- Clarity: the indicator is easily understood and calculated.
- Usefulness: the indicator reflects an important aspect of performance.
- Measurability: the indicator can be defined in quantitative terms and used within existing constraints on information quality and availability.
- Reliability: the indicator permits consistent assessment over time and among different observers.
- Validity: the indicator is a true measure of what it is meant to measure (see Chapter 36). Validity must also be based on the indicator's acceptance by key stakeholders and the consistency of interpretation among different stakeholders.

Table 48-1 Examples of performance indicators and performance targets

Objective and performance indicator	Performance target
Overall performance	
Central stores: indicator pharmaceuticals available (unexpired)	90%
District stores: indicator pharmaceuticals available (unexpired)	90%
Health units: indicator pharmaceuticals available (unexpired)	90%
Health units: average stockout duration for indicator pharmaceuticals	10 days
Financing—ensure that financial resources are adequate to meet basic pharmaceutical needs	
Per capita government pharmaceutical expenditure	USD 1.20
MOH budget allocation for pharmaceuticals	15%
Actual pharmaceutical expenditures as a percentage of budgeted allocation for pharmaceuticals	85%
Medicine costs covered by user fees	60%
Procurement—obtain a regular supply of pharmaceuticals at favorable prices	
Total value of MOH medicines purchased through competitive tender	95%
Total value of MOH purchases on essential medicines list	98%
Average ratio of unit prices of indicator pharmaceuticals to international prices	0.9 to 1.1
Average lead time for external suppliers	50 days
Average lead time for local suppliers	20 days
Quality assurance—ensure that procured pharmaceuticals meet recognized standards of quality and that quality is maintained throughout the distribution chain	
Number of medicines/batches tested of number of medicines/batches procured	1 of 4
Number of medicines/batches that failed quality control testing, of number of medicines/batches tested	0
Central storage—ensure that medications are properly stored, with minimal expiration and other losses	
Medicines for which stock records and physical counts agree (all medicines)	100%
Average difference between stock records and physical count (all medicines)	Less than 5%
Drugs for which stock records, procurement records, and physical counts agree (indicator pharmaceuticals)	100%
Value of expired medicines as a percentage of total pharmaceutical purchases last year	Less than 3%
Delivery—ensure timely delivery of pharmaceuticals to health units	
Average lead time from central medical stores to health units, routine monthly orders	30 days
Average lead time from central medical stores to health units, emergency orders	5 days
Storage at health units—ensure that medicines are properly stored, with minimal expiration or other losses	
Health units using stock cards correctly	75%
Stock records correspond with physical counts	90%
Health units with expired items	25%
Health units practicing first-expiry/first-out (FEFO)	90%

In selecting indicators, considering how data will be collected is also important. Indicators may rely on generally available information from routine reporting, or they may require special surveys or other sources of information. The sources and the cost of collecting and processing these data must be carefully considered in selecting indicators.

Some indicators may be routinely available from standard recording and reporting systems (such as percentage of indicator pharmaceuticals available), whereas other indicators may require a special survey (for example, percentage of pharmaceutical costs covered by user fees or percentage of health units using stock cards correctly). Some indicators represent annual summary measures (per capita government pharmaceutical expenditure or percentage by total value of pharmaceuticals purchased through competitive tender).

It may be useful to distinguish core performance indicators, for which data are routinely reported and monitored, from complementary performance indicators, for which data may be collected only at sentinel sites or in special studies or that may be used only for periodic evaluation purposes.

The indicator examples in this chapter draw on five useful sets of internationally recognized indicators, some of which are described in greater detail in Chapter 36 (Brudon, Rainhorn, and Reich 1999; CPM 2003b; MSH/RPM et al. 1995; WHO 2007). By using internationally defined indicators for national pharmaceutical policy (Brudon, Rainhorn, and Reich 1999), pharmaceutical management (MSH/RPM et al. 1995; WHO 2007), and medicine use (Nachbar et al. 2003; WHO 2007; WHO/DAP 1993), countries can compare their performance against that of other countries.

Setting performance targets

A performance target is a desirable and—in principle—attainable standard of performance. For example, the impact indicator may be the percentage of ten indicator pharmaceutical products in stock, and the performance target may be 80 percent availability at each level for this list of indicator pharmaceuticals. Performance targets should be set for each indicator. Table 48-1 presents illustrative targets for the indicators listed.

A widely used guide to developing performance targets is SMART (MSH/LMS 2008). A SMART result is—

Specific (S): The performance target is clearly written to avoid different interpretations.
Measurable (M): The target allows a team to monitor and evaluate progress toward achieving its result.
Appropriate (A): It is in line with the scope of a team's program or work activities, so that it can have influence or make changes.
Realistic (R): The target is achievable within the time allowed.
Time-bound (T): The performance target has a specific time period for completion.

Performance indicators can be compared with agreed-upon performance standards over time within the same health unit, among health units of the same level, or across countries. Initially, comparisons among health units may help set realistic performance standards, which can be adjusted upward as the system develops.

When setting targets, managers should keep in mind that costs are associated with reaching their targets, and therefore, they should consider budget and staff limitations. For example, attaining a 100 percent service level (in essence, completely filling every order for medicines in one delivery) may not be possible or practical, even though it may be theoretically desirable. Therefore, the target should be set at an appropriate level, and the manager's challenge is to have a strategy to ensure that shortfalls in the pharmaceutical service level do not jeopardize the facility's ability to provide quality care.

Formulation of indicators

If indicators are variables that measure change, they can be counted. Indicators can be in the form of counts (400 health workers trained), rates (two workshops per year), ratios (USD .90 per tin versus USD .60 per tin equals a ratio of 3:2), proportions (400 of 1,200 health workers trained equals one-third), or percentages (400/1,200 health workers trained equals 33 percent). Indicators can also require a "Yes" or "No" response ("Yes, there is a national pharmaceutical policy," or "No, standard treatment guidelines have not been updated in the last three years").

When defining a numerical indicator, considering the availability of information is important. Proportions and percentages require that the size of the whole (the denominator) be reliably known; if not, then actual counts may be more useful. For example, if the number of health workers in a district is not precisely known, specifying a count (400 health workers trained) is preferable to a percentage that cannot be verified.

Indicator pharmaceuticals and supplies

Several of the performance indicators listed in Table 48-1, mentioned in Chapter 36, or included in some of the chapter assessment guides are based on the availability, prices, and accuracy of stock records for a list of indicator pharmaceuticals and supplies.

Indicator pharmaceuticals and supplies are a small number of representative items, which are also known as tracer or index medicines. Economists use a market basket of common goods and services to measure inflation through the consumer price index. Similarly, the list of indicator medicines is sometimes called a basket of medicines (WHO 2006). The advantage of using a list or basket of items for indicators is that data collection and analysis are simplified.

Selecting which items to include on a tracer list is based on preestablished criteria and should include input from important stakeholders. The items should be on the national essential medicines list or national medicine formulary, therapeutically important, widely used, appropriate for the level of care where measurements will be made, and commonly available internationally (if the study includes multinational comparisons). In principle, these items should be available at all times (target 100 percent). For this reason, inclusion of medicines that are not commonly used, that are difficult to obtain, or that have other unusual characteristics influencing how they should be managed is not practical.

Table 48-2 provides a list of medicines, grouped by therapeutic category, that was used to assess the pharmaceutical supply system in Tanzania. Depending on the purpose and uses of the indicators, distinguishing a list of fifteen core indicator medicines to use as indicators for all levels of the health system and a supplementary list of ten additional

Table 48-2 Example of a list of indicator pharmaceuticals and supplies

Pharmaceutical/supply	Form, dosage
Analgesics/antipyretics	
Acetylsalicylic acid (aspirin)	Tablet, 300 mg
Paracetamol	Tablet, 500 mg
Antihelminthics	
Mebendazole	Chewable tablet, 100 mg
Anesthetic	
Ketamine	Vial, 50 mg/mL
Antibacterials	
Amoxicilline	Tablet, 250 mg
Metronidazole	Tablet, 450 mg
Benzylpenicillin sodium	Vial, 5 MU
Sulfamethoxazole/trimethoprim (co-trimoxazole)	Tablet, 400 mg + 80 mg
Ciprofloxacin	Tablet, 500 mg
Doxycycline	Tablet, 100 mg
Erythromycin	Tablet, 250 mg
Gentamycin	Ampoule, 40 mg/mL
Rifampicin + isoniazid	Tablet, 150 mg/100 mg
Antimalarials	
Sulfadoxine/pyrimethamine	Tablet, 500 mg/25 mg
Quinine dihydrochloride	Ampoule, 300 mg/mL
Cardiovascular medicines	
Propranolol	Tablet, 40 mg
Hydroclorothiazide	Tablet, 25 mg
Gastrointestinal medicines	
Oral rehydration salts	Sachet
Minerals	
Ferrous sulfate + folic acid	Tablet, 200 mg/0.25 mg
Ophthalmological preparations	
Oxytetracycline eye ointment 1%	Tube, 5 mg
Vaccines	
Polio vaccine	Vial

Source: CPM 2003a.

medicines to use at central storage facilities and hospitals may be helpful. The supplementary list of items might include other dosage forms, such as injections and topical preparations, and additional therapeutic categories, such as cardiovascular medications and contraceptives. Items to consider for the core list include oral rehydration solutions, procaine penicillin injections, paracetamol tablets, tetracycline eye ointment, iodine, gentian violet or a local alternative, benzoic acid and salicylic acid ointment, or retinol (vitamin A) (WHO 2007).

To facilitate measurement calculations and consistency, the number of items on the list should be kept small: a list of ten or twenty medicines usually suffices. For calculating rates and percentages, using a number that divides easily into 100 (for example, 10, 20, or 25) is convenient. Larger or more diverse lists of indicator pharmaceuticals may be needed for specific purposes. When first introducing performance indicators and indicator items, however, it is probably wise to keep to a core list such as that shown in Table 48-2.

48.6 Using the monitoring system to improve performance

A monitoring system gives managers a way to identify potential problems with program and staff performance and to improve performance. A formalized monitoring system facilitates the development of improvement plans and performance targets, all of which must be clearly communicated at all levels of the pharmaceutical management system. For the monitoring system to be useful, managers should review and share the results regularly and take timely action to follow up. For example, Country Study 48-4 shows how a psychiatric hospital instituted a monitoring system that included regular feedback to psychiatrists to improve prescribing habits. The ongoing monitoring activities will determine if follow-up actions achieved the desired results.

Communicating plans and targets

Program plans and workplans are sometimes viewed simply as documents for fund-raising or for "the people above." To the contrary, they should be blueprints to guide the day-to-day work of staff at all levels, who need to be aware of the plans as well as of output and performance targets. Managers should communicate plans and targets both in writing and face-to-face: memoranda or circular letters alone are usually insufficient. Often, staff members need some education or training to understand why indicators were selected, how they are measured, and how results will be used.

Reviewing progress

A schedule is needed to review program progress, with the review period depending on the nature of the plan and the specific indicators. Managers should review implementation progress for a five-year program plan, for example, at least once a year. During the review, key staff members meet to systematically assess each objective, each activity, and each output target. For an annual workplan, reviewing progress each month or at least each quarter is important. New programs should also be reviewed often as they are getting off the ground.

In a progress review, actual outputs and performance are compared against the established targets; when discrepancies exist between the expected results and actual perfor-

mance, further discussion or investigation is needed. When progress has exceeded expectations, managers should ask whether positive lessons can be learned and whether specific people should be recognized for their work. Table 48-3 provides an example of a progress review based on a workplan to promote rational medicine use.

When progress is less than expected, it is even more important for managers to ask the reasons why. For instance—

- Were necessary funds, materials, or other inputs lacking?
- Were two units unable to communicate their expectations to each other or to coordinate their actions?
- Did key staff simply fail to take the plans and performance targets seriously?
- Is failure to achieve a specific planned output a reflection of overly ambitious plans?

A well-designed, well-implemented monitoring system can usually provide information on *what* happened or did not happen. Information about *why* things happened—or did not happen—may come from the monitoring system or may require management follow-up.

Giving feedback

No monitoring system is complete without feedback. Giving feedback to individual units or staff members tells them how well they have done the reporting and how useful the information is. Feedback also demonstrates the value and importance of the reports. As such, it represents one of the most powerful tools for motivating staff. Feedback also improves the quality of data by breaking the "bad data cycle" (see Chapter 49).

Direct, action-oriented feedback involves presenting staff with some of the problems and successes identified in the monitoring or evaluation reports—

- Discuss the achievement of specific performance targets.
- Identify weak performers for more intensive supervision or training.
- Identify and congratulate successful districts and facilities.
- Identify policy or program weaknesses and how to strengthen them.

Always check to see whether the information has been used, how it has been used, and what action has been taken.

Taking action

Effective use of the monitoring system requires prompt follow-up action. A manager can take at least five types of action—

- Provide positive feedback to high-performing units or staff to encourage continued good performance.

Country Study 48-4
Monitoring the use of neuroleptic medicines in a psychiatric hospital in Tatarstan, Russia

Neuroleptic drugs, such as chlorpromazine, can help control symptoms related to schizophrenia, but overuse, polypharmacy, and medicine interactions can contribute to dangerous adverse effects, such as irreversible movement disorders. The Clinical Psychiatric Hospital in the Republic of Tatarstan, Russia, implemented a monitoring system to measure the use of neuroleptic drugs and related adverse effects and to institute regular feedback to hospital psychiatrists aimed at decreasing the use of neuroleptic medicines and improving overall prescribing habits.

The hospital used standardized medicine-use indicators developed by the World Health Organization (WHO) to track the outcomes related to the monitoring program. Results showed that implementing medicine-use monitoring helped psychiatrists improve their prescribing habits for schizophrenic patients, although adding an educational intervention component to regular monitoring might result in additional gains.

Source: Ziganshina et al. 2004.

	WHO medicine use indicators[a]				
Year	Number of medicines/patient	Percentage of cases prescribed generic medicines	Percentage of cases including antibiotics	Percentage of medicines on formulary	Percentage of cases prescribed injections
1[b]	8.3	56.7	32.2	63.5	40.8
2	5.8	69.1	10.6	99.0	38.8

[a] WHO/DAP 1993.
[b] Before monitoring system was implemented.

Table 48-3 First-year progress review for promoting rational medicine use

Objectives/activities	Outputs		Budgets		Expenditures	Balance	Comments
	Target	Actual	Five-year budget (USD)	First-year budget (USD)	First-year actual (USD)	First year (USD)	
Selection							
Essential medicines list (EML): Revise and distribute national EML at least every two years.	Revision of EML completed	Done	4,000	2,000	2,850	850	Required additional workshop to finalize
Prescribing							
Undergraduate training: Ensure that all students are trained in essential medicines concept and rational medicine use in basic health curricula (amount of time depends on professional category).	Curricula designed for medicine, pharmacy, nursing, paramedical training	Initial workshop held, curricula not completed	5,000	5,000	2,670	2,330	
Standard treatment guidelines (STGs): Develop/revise and distribute standard treatment manual at least every four years.	First edition of STGs completed and distributed	Manual completed and printed, not distributed	96,000	48,000	39,860	8,140	
Continuing education: Provide all clinicians with at least one week of in-service training on rational medicine use every three years.	Sixty-five percent of clinicians trained (1,300 of estimated 2,000)	Training designed, first workshop held	84,000	42,000	4,830	37,170	
Dispensing							
Packaging and labeling: Ensure that at least 80 percent of patients receive medications in clearly labeled containers or dispensing envelopes.	Packaging and labeling materials provided, sufficient for 80 percent of patients	Materials ordered, not received	15,000	3,000	0	3,000	Materials order placed too late
Patient use							
Undergraduate training: Ensure that all students are trained in communications and patient education methods in basic health curricula (amount of time depends on professional category).	Combined with essential medicines training for prescribing	See above	See above	0	0	0	
Continuing education: Include skills for patient education at in-service training workshops.	Combined with essential medicines training for prescribing	See above	See above	0	0	0	
Total			**204,000**	**100,000**	**50,210**	**49,790**	

- Provide corrective feedback to staff or units that have not met expectations, but that should be able to take specific steps to improve their performance; many problems can be corrected through supervision and retraining.
- Reallocate resources or reassign staff to achieve a better fit between the task to be accomplished and the resources or staff available.
- Make plans and targets more realistic based on actual experience.
- Request additional information to further define a specific performance problem and the reasons for the problem.

Country Study 48-5 illustrates how indicators can be used to improve performance through self-monitoring.

Whatever actions are taken after a progress review, the effects of these actions should be considered at the next progress review.

Table 48-4 Types of evaluation

Type	Project stage	Purpose
Needs assessment (initial analysis)	Design	• Assess current situation • Develop program/project plan • Acquire baseline for comparison
Formative evaluation (midterm review)	Implementation	• Focus on implementation process • Assess progress toward goals and objectives • Improve program/project implementation
Summative evaluation (final evaluation)	Follow-up	• Assess program/project outputs • Measure impact of program/project • Demonstrate program/project impact to donors • Recommend future actions

Source: Adapted from García-Núñez 1992.

48.7 Evaluation

Whereas monitoring focuses on program activities, evaluation focuses primarily on assessing progress toward achieving goals by fulfilling program objectives—taking a step back to look at the program as a whole. An evaluation is carried out at a specific time and should have a clear purpose.

Evaluation questions

Depending on the timing and purpose, evaluations may be of three types (Table 48-4)—

1. Needs assessment (situation analysis)
2. Formative evaluation (midterm review)
3. Summative evaluation (final evaluation)

A needs assessment or situation analysis is meant to appraise the pharmaceutical system or essential medicines program and to identify areas of strength and weakness (see Chapter 36). The purpose is to design a project to address major weaknesses in the system.

Formative and summative evaluations are more programmatic and concerned with answering some or all of the following questions—

- Is the program relevant? Are its goals and objectives appropriate to the present circumstances of the country and the pharmaceutical system?
- Is the program effective? Is it achieving satisfactory progress toward its stated goals and objectives? What are the reasons for success or failure?
- Are monitoring results representative? Do the results from the program's monitoring system reflect the actual situation?
- Is the program efficient? Are the effects of the program being achieved at an acceptable cost compared with alternative approaches to providing the same services?
- Is the program sustainable? Financially and institutionally, can the program continue with present levels of local inputs? If external financial and technical assistance is involved, can the program continue after it has stopped?
- Is the program having the intended impact? Does the program appear to be achieving or will it achieve its intended long-term health care benefits?
- What future changes should be made? What recommendations can be made for program development, new plans, or project assistance? Are new goals or objectives needed?

In practice, needs assessments, formative evaluations, and summative evaluations sometimes overlap. For example, the final evaluation for one project may also serve as the needs assessment for the next project.

Conducting an evaluation

Chapter 36 describes three approaches to assessment: self-assessment, limited assessment, and structured assessment. Structured assessment is the most comprehensive but requires the most resources. The choice of assessment approach depends on available financial and human resources, timing, sponsorship, and intended uses of the results.

Health program and health project evaluations are sometimes limited assessments, consisting primarily of

Country Study 48-5
Use of indicators for self-monitoring in rural Java

The twenty-nine health centers and 109 subcenters of Gunungkidul district in Java, Indonesia, suffer from periodic shortages of medicines, as do other health facilities. These shortages are caused by limited resources; increasing patient demand; and overprescribing of injections, antibiotics, and other medicines. To address this problem, the district health team in Gunungkidul undertook a series of activities to improve and control medicine use.

The team first surveyed medicine use with three prescribing indicators. Results showed extensive polypharmacy (4.2 medicines per case), a high percentage of patients receiving antibiotics (63 percent), and a very high percentage receiving injections (76 percent). The team explored these issues in randomly selected health centers using in-depth interviews, observation, focus group discussions, and questionnaires (see Chapter 28). From this information, a self-monitoring system was developed, pilot-tested, and implemented in all health centers in the district.

Each health center completes a monitoring form each month, based on a survey of thirty cases in each health center and subcenter. Results are discussed locally and forwarded to the District Health Office for review. Data from the four subcenters under Widoyo Health Center are compared with those from the previous month (see the accompanying figure). Using this form, health center staff can easily determine whether each indicator has increased or decreased in each facility.

The continuity of the self-monitoring process is sustained by—

- Weekly staff meetings of the district team at which results are discussed
- Monthly district-level meetings for the heads of all health centers
- Regular feedback and occasional supervisory visits to health centers by members of the district team

After two years, an evaluation showed substantial improvements in all three indicators. Despite these changes in practice, the number of attendances at health centers had remained constant. Interviews with health workers showed improved attitudes toward the use of standard treatments, willingness to improve skills, and increased communication among health workers and the district team.

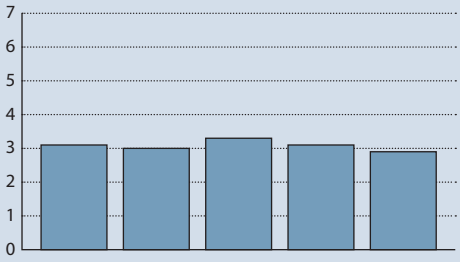
Source: Sunartono and Darminto 1995.

Local area monitoring form

Health center Widoyo | Month/Year June 2010

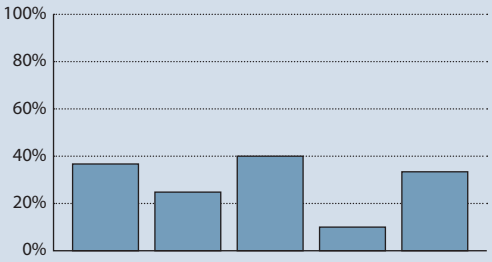
Number of cases sampled 30

Medicines per case



	I	II	III	IV	Avg.
Current month	3.1	3.0	3.3	3.1	2.9
Previous month	3.0	2.8	3.5	3.2	3.0
Trend	∧	∧	∨	∨	∨

Injections



	I	II	III	IV	Avg.
Current month	36.7	24.8	40.0	10.0	33.4
Previous month	33.0	29.0	40.0	16.7	35.1
Trend	∧	∨	–	∨	∨

interviews, secondary analysis of existing monitoring and other data, and review of available documents. Increasingly, however, evaluations are expected to contain performance data indicating what services and outcomes are resulting from the program. The starting point for an evaluation should be the data collected through the monitoring system, but field surveys using standard pharmaceutical sector assessment indicators (WHO 2007) will contribute to a much more objective, credible, and useful evaluation.

Evaluation methods and tools

An evaluation is much like a research project. The usual considerations of research design apply, including defining the scope and questions for the evaluation, choosing evaluation methods, developing and testing data collection instruments, managing data collection, collating and analyzing data, interpreting results, and presenting the findings.

Methods of obtaining information include document review, key informant interviews, data collection from existing records, and prospective surveys. These methods and the steps involved in a structured assessment are discussed in detail in Chapter 36.

Knowledge, skill, and experience are required to design and execute a credible, comprehensive evaluation. See References and Further Readings for several sources that provide practical guidance on evaluation methods.

Who should evaluate?

When individuals involved in a program carry out an evaluation, they have the advantage of understanding its aims and design; however, such evaluations can be subjective and may miss important lessons. Therefore, outsiders are frequently asked to perform evaluations. Because they are disinterested, outsiders may be more objective and may bring fresh ideas. Outside evaluators might come from local universities, local nongovernmental organizations, international organizations, or organizations in other countries.

Combined insider and outsider evaluations have many advantages. The outsider, being ignorant of the local situation, can ask the difficult questions, and the insider often knows whether the true answer is being given. Having the insider view the program or project through the eyes of the outsider is also useful. The outsider benefits because the insider knows where the answers are to be found.

Resources required

Evaluation is an activity that goes beyond routine monitoring and requires staff, time, and funds to be earmarked for it. In the case of a specific program, funds for evaluation should be built into the original proposal. Careful costing should be performed, taking into account all proposed activities.

The budget should be prepared early in the planning process. A template presented in Table 48-5 can be used to develop a budget. It should be updated as additional information becomes available, such as personnel daily rates and the cost of translators, if needed. Some key considerations for the budget include—

- Team member time
  - Planning time—technical lead and administrative/logistics support
  - Team member time—preparatory, fieldwork, and report preparation
- Travel costs (as needed)
  - Airfare
  - Per diem
  - Visa costs
  - Telecommunications costs (phone/Internet access)
- Contracted services (as needed)
  - Local consultant
  - Translator(s)
  - Driver(s) and car(s)
  - Conference room facilities for the stakeholder workshop (room charge, food costs, and equipment rental)
- Miscellaneous charges
- Photocopies—reference materials, reports, etc.
- Postage (mailing documents prior to visit, for example)

48.8 Some common pitfalls in monitoring and evaluation

Although monitoring and evaluation are two distinct activities, they share certain common pitfalls—

Failure to identify the basic questions: All monitoring and evaluation activities should start with a clear statement of the questions they intend to answer. Without this, the information gathering has no focus.

Overambitiousness: Collecting too much information is perhaps the most common failing. A basic rule is that more information means greater expense, less accuracy, more time spent managing the data, less time spent interpreting the data and providing feedback, and less time for using the data.

Complexity: Monitoring systems should be as practical and streamlined as possible. Cumbersome systems have often been designed from the top down, with insufficient testing and input from staff involved in generating and using monitoring information.

Lack of integration with planning and implementation: Monitoring and evaluation activities should follow directly from program plans, link closely with ongoing

Table 48-5 Sample assessment budget template

Line Item		Rate (USD)	Unit	Quantity	Total (USD)
Labor (add lines for as many people as needed)					
Name	Title		/day	# days	
Name	Title		/day	# days	
Name	Title		/day	# days	
Name	Title		/day	# days	
Name	Title		/day	# days	
Subtotal U.S. Labor					**Subtotal**
Travel					
Travel – airfare	Destination		/trip	# fares at that rate	
Travel – airfare	Destination		/trip	# fares at that rate	
Travel – airfare	Destination		/trip	# fares at that rate	
Per diem	Destination		/days	# days	
Per diem	Destination		/days	# days	
Per diem	Destination		/days	# days	
Other costs – local travel	Destination		/trip	#	
Other costs – visa			/trip	#	
Other costs – misc.			/trip	#	
Subtotal travel					**Subtotal**
Subcontracts/outside services					
Conference room	Stakeholder workshop		/day	# days	
Coffee service	Stakeholder workshop		/person	# people	
Audiovisual equipment	Stakeholder workshop		/day	# days	
Driver and car			/day	# days	
Translators			/day	# days	
Subtotal subcontracts					**Subtotal**
Other costs					
Postage					
Communications					
Other					
Subtotal other					**Subtotal**
Total assessment budget					**(Sum of subtotals)**

implementation activities, and lead logically into the next round of planning.

Failure to build on existing systems: Existing information systems are never perfect, but considerable resources can be squandered trying to build a separate system instead of building on and strengthening existing systems.

Inadequate resources: Both monitoring and evaluation require considerable financial and human resources. It is generally better to seek additional resources or narrow the scope of assessment rather than try to gather too much information with too few resources.

Lack of objectivity: Management indicators introduce some objectivity into the assessment process; assessments based only on subjective information are less credible and less useful.

Jumping to wrong conclusions: Well-designed monitoring and evaluation systems allow some cross-checking of findings. Taken out of context, individual monitoring reports and evaluation observations can be misleading.

Lack of comparison data: Observations must be compared over time, against agreed-upon performance standards, among health units at the same level, or across countries. Good baseline data against which changes can be compared are especially useful, but to be valid, they must come from the same sources and have the same measures as the follow-up data. If the sources or measures are altered, it is difficult to say whether apparent changes (good or bad) are real or are a result of the assessment process.

Other common problems are failure to analyze data promptly, lack of feedback mechanisms to apply results, evaluations that do not gather new information, and monitoring done for the wrong reasons. Inappropriate reasons for monitoring and evaluation include doing the activity because of tradition or donor requirements and using the activity to try to resolve conflicts between donors and recipients or to get information to punish certain staff members. ■

References and further readings

★ = Key readings.

Bhattarai, H. R., and H. Walkowiak. 2005. *Mombasa Antiretroviral Therapy Program: Monitoring and Evaluation Plan for Pharmaceutical and Laboratory Capacity Building Activities, February 2004.* Arlington, Va.: Management Sciences for Health, Rational Pharmaceutical Management Plus Program.

★ Brudon, P., J.-D. Rainhorn, and M. R. Reich. 1999. *Indicators for Monitoring National Drug Policies*. 2nd ed. Geneva: World Health Organization. <http://whqlibdoc.who.int/hq/1999/WHO_EDM_PAR_99.3_pp1-114.pdf>

CPM (Center for Pharmaceutical Management). 2003a. *Access to Essential Medicines: Tanzania, 2001.* Prepared for the Strategies for Enhancing Access to Medicines Program. Arlington, Va.: Management Sciences for Health. <http://www.msh.org/seam/reports/CR022304_SEAMWebsite_attach1.pdf>

★ ———. 2003b. *Defining and Measuring Access to Essential Drugs, Vaccines, and Health Commodities: Report of the WHO-MSH Consultative Meeting, Ferney-Voltaire, France, December 11–13, 2000*. Prepared for the Strategies for Enhancing Access to Medicines Program. Arlington, Va.: Management Sciences for Health. <http://www.msh.org/seam/reports/Access_Meeting_Ferney_Voltaire_1.pdf>

Federal Ministry of Health, Nigeria. 2010a. *Access to and Rational Use of Medicines at the Facility Level.* Abuja: Federal Ministry of Health. <http://apps.who.int/medicinedocs/documents/s16886e/s16886e.pdf>

———. 2010b. *Access to and Rational Use of Medicines at the Household Level.* Abuja: Federal Ministry of Health. <http://apps.who.int/medicinedocs/documents/s16887e/s16887e.pdf>

Fresle, D. A., A. Hardon, and C. Hodgkin. 2004. *How to Investigate the Use of Medicines by Consumers*. Geneva: World Health Organization and University of Amsterdam. <http://apps.who.int/medicinedocs/pdf/s6169e/s6169e.pdf>

García-Núñez, J. 1992. *Improving Family Planning Evaluation*. West Hartford, Conn.: Kumarian Press.

Global Fund to Fight AIDS, Tuberculosis and Malaria. 2006. *Monitoring and Evaluation (M&E) Toolkit: HIV/AIDS, Tuberculosis and Malaria*. 2nd ed. Addendum March 2008. <http://www.info.gov.za/issues/hiv/global_fund08_toolkit.pdf>

Global Partnership to Roll Back Malaria, Monitoring and Evaluation Reference Group. 2005. *Malaria Indicator Survey: Basic Documentation for Survey Design and Implementation*. Geneva: World Health Organization. <http://whqlibdoc.who.int/publications/2005/9241593571_eng.pdf>

LeMay, N. 2010. "Managing Information: Monitoring and Evaluation." In *Health Systems in Action: An eHandbook for Leaders and Managers,* S. Vriesendorp, L. de la Peza, C. P. Perry, J. B. Seltzer, M. O'Neil, S. Reimann, N. M. Gaul, et al., eds. Cambridge, Mass.: Management Sciences for Health. <http://www.msh.org/resource-center/health-systems-in-action.cfm>

MSH (Management Sciences for Health). 2001. Using Evaluation as a Management Tool. *The Manager*. Vol. 9. Boston: MSH. <http://erc.msh.org/mainpage.cfm?file=2.1.1.htm&language=english&module=info>

MSH/LMS (Management Sciences for Health/Leadership, Management and Sustainability Program). 2008. *From Vision to Action: A Guide on Monitoring and Evaluation for Facilitators of Leadership Development Programs*. Cambridge, Mass.: MSH/LMS.

Nachbar, N., J. Briggs, O. Aupont, L. Shafritz, A. Bongiovanni, K. Acharya, S. Zimicki, S. Holschneider, and D. Ross-Degnan. 2003. *Community Drug Management for Childhood Illness: Assessment Manual.* Arlington, Va.: Management Sciences for Health. <http://erc.msh.org/toolkit/toolkitfiles/file/C-DMCI%20Assessment%20Manual%20English.pdf>

Rational Pharmaceutical Management Plus Program (RPM Plus). 2009. *A Guide for Implementing the Monitoring-Training-Planning (MTP) Approach to Build Skills for Pharmaceutical Management*. Arlington, Va.: Management Sciences for Health.

★ Rational Pharmaceutical Management Project/Management Sciences for Health (MSH/RPM), Latin American and Caribbean Health and Nutrition Sustainability Project/University Research Corporation, and Regional Program on Essential Drugs/Pan American Health Organization. 1995. *Rapid Pharmaceutical Management Assessment: An Indicator-Based Approach*. Arlington, Va.: MSH/RPM. <http://erc.msh.org/newpages/english/toolkit/rpma.pdf>

ASSESSMENT GUIDE

Monitoring methods and systems

- Does a program or unit exist to monitor and evaluate pharmaceutical services? Who is responsible for monitoring and evaluation?
- Is monitoring based on program objectives and linked to specific activities? Are these objectives, along with output targets and performance targets, clearly communicated to concerned staff?
- Which of the following methods are used as sources of monitoring information: supervisory visits, routine reporting, sentinel reporting, special studies?
- How often are data collected? How are they used?
- Are monitoring results regularly reviewed and shared? How and with whom? Is feedback provided to concerned staff?
- What actions are taken when problems are detected through monitoring and evaluation?

Indicators

- Have performance indicators been established? If so, how were they established, and who was involved? Do they include process, output, and impact indicators? Are they both qualitative and quantitative? Have performance targets been set?
- Have indicator pharmaceuticals been identified for indicators requiring medicine-specific information?

Evaluation

- Is progress toward achievement of program goals and objectives periodically assessed through formal evaluation?
- Does the evaluation begin with a clear statement of its basic question? Is this question used as a focus for information gathering?
- Which of the following methods are used to obtain information—review of existing monitoring reports, additional data collection, document review, interviews, field surveys using standard pharmaceutical assessment indicators?
- How is the evaluation team determined? Does it include insiders, outsiders, or both?

Sunartono, Y., and B. Darminto. 1995. From Research to Action: The Gunungkidul Experience. *Essential Drugs Monitor* 20:21–2.

Trap, B., C. H. Todd, H. Moore, and R. Laing. 2004. *Impact Assessment of Supervision on Medicines Management*. Presentation to the International Conference on Improving Use of Medicines, March 30–April 2, Chiang Mai, Thailand.

UNAIDS (Joint United Nations Programme on HIV/AIDS). 2002. *Monitoring and Evaluation Modules*. Geneva: UNAIDS. <http://data.unaids.org/Topics/M-E/me-modules-a4_en.pdf>

UNFPA (United Nations Population Fund). *The Programme Managers Planning, Monitoring and Evaluation Toolkit*. <http://www.unfpa.org/monitoring/toolkit.htm>

U.S. President's Emergency Plan for AIDS Relief (PEPFAR). 2009. *The President's Emergency Plan for AIDS Relief: Next Generation Indicators Reference Guide*. Version 1.1. Washington, D.C.: PEPFAR. <http://www.pepfar.gov/documents/organization/81097.pdf>

Valadez, J. J., W. Weiss, C. Leburg, and R. Davis. 2002. *Assessing Community Health Programs: A Participant's Manual and Workbook; Using LQAS for Baseline Surveys and Regular Monitoring*. Washington, D.C.: Child Survival Collaborations and Resources Group, CORE. <http://www.coregroup.org/storage/documents/Workingpapers/LQAS_Participant_Manual_L.pdf>

World Bank. 2004. *Monitoring and Evaluation: Some Tools, Methods and Approaches*. Washington, D.C.: World Bank. <http://go.worldbank.org/1K0M1NHOQ0>

★ WHO (World Health Organization). 2010. *Country Pharmaceutical Situations: Fact Book on WHO Level 1 Indicators, 2007*. Geneva: WHO. <http://apps.who.int/medicinedocs/documents/s16874e/s16874e.pdf>

★ ———. 2007. *WHO Operational Package for Assessing, Monitoring and Evaluating Country Pharmaceutical Situations: Guide for Coordinators and Data Collectors*. Geneva: WHO. <http://apps.who.int/medicinedocs/documents/s14877e/s14877e.pdf>

★ ———. 2006. *Using Indicators to Measure Country Pharmaceutical Situations: Fact Book on WHO Level I and Level II Monitoring Indicators*. Geneva: WHO. <http://www.who.int/medicines/publications/WHOTCM2006.2A.pdf>

———. 2004a. *Compendium of Indicators for Monitoring and Evaluating National Tuberculosis Programs*. Geneva: WHO. <http://whqlibdoc.who.int/hq/2004/WHO_HTM_TB_2004.344.pdf>

———. 2004b. *National AIDS Programmes: A Guide to Monitoring and Evaluating HIV/AIDS Care and Support*. Geneva: WHO. <http://www.who.int/hiv/pub/epidemiology/en/Care&SupportGuideE.pdf>

WHO/DAP (World Health Organization/Action Programme on Essential Drugs). 1993. *How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicators*. Geneva: WHO/DAP. <http://whqlibdoc.who.int/hq/1993/WHO_DAP_93.1.pdf>

WHO/HAI (World Health Organization and Health Action International). 2008. *Measuring Medicine Prices, Availability, Affordability and Price Components*. 2nd ed. Geneva: WHO/HAI. <http://www.haiweb.org/medicineprices/manual/documents.html>

Ziganshina L. E., A. V Kuchaeva, F. F. Gatin, and L. M. Minnetdinova. 2004. *Pharmacoepidemiological Monitoring Helps in Reducing Neuroleptic-Induced Extrapyramidal Disorders at the Psychiatric Clinical Hospital in Tatarstan*. Presentation to the International Conference on Improving Use of Medicines, March 30–April 2, Chiang Mai, Thailand. <http://www.icium.org/icium2004/agenda.asp?keyword=Tatarstan>