



INDICATORS AND PARAMETERS TO ASSESS ACTIVITIES AT THE LOCAL LEVEL TO CONTROL ACUTE RESPIRATORY INFECTIONS

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I. INTRODUCTION

Proper implementation of a program to control acute respiratory infections (ARI) means that program goals and objectives must be clearly defined. The goals will indicate to what extent objectives are achieved within a given timeframe.

To achieve the goals, the specific activities that are planned beforehand need to be carried out. The success anticipated in reducing the problem is specified in the major and subordinate goals.

To ascertain the extent to which proposed goals are achieved, the processes known as monitoring and assessment are performed on a regularly scheduled basis and at the conclusion of the period that is scheduled for the activities (1, 2).

The assessment of the activities and the course of ARI control is attempted through verifying the status and relationship of the following aspects (3-5):

- The original situation that prevailed before control activities were conducted (situational analysis);
- The current situation at the time the assessment is conducted;
- What was anticipated for the current moment, in terms of what was originally specified in the major and subordinate program goals.

This process allows the progress of ARI control actions to be gauged. Major program goals and subordinate goals provide the framework for the assessment since they are compared to the kind of impact that has resulted.

Both the processes of planning and of assessment have different characteristics at the local level. Activities performed at the local level will also be somewhat different than at the national or central level. It is at the local level that actions performed and the target population are most closely understood. This proximity presents advantages in performing the assessment at the local level as compared to the central level (6-8):

- More thorough analysis because more specific data are available;
- Veracity in the direct, reciprocal relationships between those who issue information and those who analyze it;
- Timeliness of data analysis—i.e., far briefer time span between when the data are issued and when they are analyzed;
- Greater flexibility and speed in responding to problems that are detected;
- Participation in the assessment process by the personnel who are direct providers of care and by the community.

Based on this general plan for the main assessment areas and their different characteristics as they are applied at the local level, this chapter presents an assessment proposal for ARI control actions at the local level.

It may be advisable to use average indicators of the situation—that is, the ratios between the number of times a phenomenon is observed and the total population in which the phenomenon applies. These indicators are known as rates, percentages, or proportions; examples include disease incidence, the percentage of antibiotic use, the proportion of health centers or posts that have oxygen available, just to name a few.

In other cases, particularly at the local level, accurate representation of average health indicators may not be feasible. Under these circumstances, it is advisable to conduct individual case analysis to estimate, for example, pneumonia mortality in a given area or to use the data to supervise health services where cases of meningitis are found.

Organization of and assessment of data collection and analysis are covered in the preceding chapter, “Evaluating Control Mechanisms for Acute Respiratory Infections.”

The following section describes the indicated model assessment, along with indicators suggested for specific aspects.

II. THE ASSESSMENT PROCESS

The assessment process concerns the evaluation of what may be called “executed activities,” or the activities that are performed or conducted. In other words, the assessment is intended to verify whether all activities planned or provided for have indeed been carried out and, if so, to what extent.

This section will consider the assessment of activities that should be carried out—specifically: training, supplies, communication, supervision, monitoring, and assessment. The purpose of these activities, which constitute steps to be followed in the implementation of ARI con-

trol, is to offer a greater number of health services and health personnel to the community to afford greater access to standard ARI case management in the community (1, 2).

The performance of these activities and the greater access that is expected to be made available do not, on their own, ensure that the population will in fact use the health services to address problems that affect a child's health. Thus, the progress anticipated must also be expressed in terms of the actual use the population makes of these health services. Thus, the results to be assessed are examined within two kinds of parameters that are defined in the planning process as the access goal and the usage goal.

a) Training

Training health personnel in standard ARI case management is the first step in the process to increase access to the strategy, and is normally an activity planned in great detail. The training assessment must verify whether the number of personnel provided for in the planning stage were trained in the corresponding time period. Two basic indicators are proposed:

a.1) Proportion of health personnel in the area who have received training in standard ARI case management.

This indicator is the most direct reflection of results from training. A high proportion would indicate that training was properly performed during the period of time in question.

A breakdown of the type of personnel may be advisable (e.g., physicians, nurses, aides, and community health workers), particularly because the kind of personnel performing health services varies widely in the countries of the Region. This disaggregation can reinforce training efforts by indicating which personnel have missed the training and how different categories compare.

In addition, the assessment can indicate how many of the personnel received practice in care of children with ARI. The assessment of this aspect is of great importance to establish if the trained personnel were instructed in the specific skill of case management, which is one of the major goals of the program.

a.2) Proportion of health services in area that have available at least one staff member trained in standard ARI case management.

This indicator is also related to the access of the population to standard ARI case management and takes into account the previous indicator as well. And, as in that instance, this indicator can also reflect each category of health personnel that has received the training. In many countries only the physician is capable of prescribing drugs, in which case the benefits of the training would be limited if nurses, for example, were the only health personnel to receive it. Thus, one may wish to further refine this indicator by tracking the number of services in which at least one member in each professional category (physician, nurse, aide) has received this training.

Comparisons of the two proposed indicators can illuminate the following kinds of situations:

- When the first indicator reflects a high value (i.e., the corresponding goal has been nearly accomplished), but the second indicator reflects a low value (i.e., only a small proportion of the health services have benefited), the health services and personnel are then acutely concentrated in a few centers. In such instances, a conscious attempt may be required to ensure a greater number of health centers and posts are covered by the training.
- When a low percentage of personnel have received training but a high percentage of centers have specifically trained personnel, the training efforts may likely be excessively dispersed in response to an attempt to cover the greatest number of health centers and posts. Such a situation is likely to require more thorough coverage of personnel in each category.

In any event, the individuals responsible for the assessment will need to recall that the significance of the relationship between the indicators will depend on several factors, such as the number of health centers available, the demand for care that each of the centers must ideally meet, and the concentration of personnel.

To arrive at a clear demonstration that problems exist, which means that training goals have not been fulfilled, a thorough analysis of different aspects should be made to find the origins of the problems. Such an analysis requires the following indicators:

- a.3) **Obtain the proportion of scheduled courses that were conducted effectively and indicate whether all of the courses scheduled were actually held. If some were not, study the reasons for it.**
- a.4) **Obtain the proportion of aides among the total number of personnel invited to participate. If attendance is low, the reason should be investigated.**

Other indicators can be found that also demonstrate problems that may occur in the series of training activities. In all cases, it is important to establish what the problems are and propose realistic solutions.

b) Provision of supplies

The provision of supplies is the second essential element to consider in ensuring that health centers provide standard ARI case management. Certain additional aspects should be covered by the assessment:

- In general, providing supplies, particularly drugs, is not an area of responsibility incumbent on the personnel in charge of coordinating ARI control activities, but rather is under the section responsible for purchasing or supplies. Thus, special coordinating efforts are required to afford an uninterrupted and sufficient supply of essential drugs.
- Often, the provision of supplies is not regarded as warranting close attention, since it is regarded as the responsibility of other offices or personnel. This attitude may occasion severe scarcity of essential drugs in the medical services.
- The supply of drugs and other essential materials is the area of ARI activities that represents the greatest monetary expense. Therefore, its assessment is of key importance in demonstrating that budgeted resources have been used appropriately or that allocations have been insufficient.

When executing ARI control activities, it is essential at all times to motivate health personnel and the community. Therefore, the lack of adequate supplies is the source of greatest frustration and complaint among health personnel and the community.

The following indicators are proposed for the assessment of supply activities:

b.1) Proportion of health centers that have a regular supply of antibiotics.

This indicator directly demonstrates the extent of coverage achieved in the supply of antibiotics. Its priority reflects the fact that the antibiotics are the most important of the supplies.

“Regular supply” in this context means that there would never be a shortage of antibiotics. If at some time they were lacking, the situation would represent an “accident” that would not normally occur. It is also important that the antibiotics recommended for ARI control are included in the supply as per the current standards for case management in the country or region.

b.2) Proportion of health centers that have a regular supply of other drugs.

The importance of antibiotics in no way negates the considerable need to have other essential drugs available.

b.3) Proportion of health centers that have a regular supply of other materials.

The supply of other key materials is often overlooked. The supply of charts for maintaining standard case management in the health centers and forms for medical and data records must also be well planned. Certainly, the major supplies are the antibiotics. However, without these other materials monitoring and assessment activities would be severely hampered by the lack of information. The provision of supplies other than drugs is usually the responsibility of the ARI control program.

The above three indicators should give an accurate idea of the coverage of supplies. At the local level, where information is more readily available and supervision more direct, the task is made easier.

If a failure to meet supply goals is found, more detailed study of each step in the supply chain will be required—budgeting, requests for bids from suppliers, purchasing, storage, distribution, and use. To the extent that it is possible, these areas should be evaluated in conjunction with the personnel responsible for the supplies.

Other aspects that can be reviewed include:

- time devoted to formulating the requests for purchases;
- time elapsed between the request for supplies to be purchased and the actual acquisition;
- time elapsed between the arrival of supplies at the storage site and the actual distribution to the services;
- regularity of deliveries;
- amounts (whether adequate or not) of each delivery;
- miscellaneous losses due to various causes (expiration of shelf life, inadequate storage, etc.)

Given that one of the objectives of the program is to decrease the inappropriate use of antibiotics and other drugs (see Section III. b in this chapter), the lack of drugs in health services may reflect excessive prescription rather than a problem in supply. Dwindling supply may also reflect antibiotic use of non-ARI pathologies or by persons over 5 years of age. In these circumstances, training must be reinforced to avoid inappropriate antibiotic use.

c) Supervision

The supervision of health services should ensure constant availability of trained personnel and adequate supplies for effective application of the strategy of standard ARI case management. But these two factors will not ensure effective implementation without regular and appropriate supervision, which is particularly effective at the local level. This supervision is also needed to detect failures and problems that call for a quick and effective response.

Thus, a detailed assessment of the supervisory work will help to make needed improvements in the later stages of the program cycle. The assessment of supervisory activities should focus on both the qualitative and quantitative aspects of supervision (9). The proposed indicator for assessing supervision in quantitative terms is as follows:

c.1) Proportion of health centers in the area that receive regular supervision.

This indicator directly reflects the extent of supervision offered in the time period under assessment. The importance of this first step is that if regular supervision cannot be exercised, other aspects of the services cannot be meaningfully examined. Detailed attention to shortfalls in fulfilling supervisory goals is required if the sources of problems are to be located.

What is meant by “regular supervision”? There is no universal definition of what constitutes “regularity,” because it is dependent on a plethora of circumstances that are specific to particular regions or geographical areas—the number of health centers in the jurisdiction, the distances that have to be covered, the means of transportation available, and the number of personnel under supervision, just to name a few. At the local level, regular supervision may simply mean the greatest number of site visits possible in the time allotted. In any case, planning an assessment of supervisory activities should always take account of the regularity of visits.

The quality of supervision is less amenable to gauging with a single indicator that will account for all pertinent factors. Some of the issues that the assessment of supervisory quality should consider are (9):

- Was a written guide prepared for the supervision? If so, does it cover all areas that should be assessed? Will the structure of the guide permit a conclusive determination of whether the standard case management strategy is being properly implemented?
- Were the personnel responsible for the supervision properly trained? Did the training include standard case management? What other areas subject to supervision were covered?
- Among the health centers that have trained personnel and adequate supplies available, to what extent is the standard case management strategy being applied?
- How long does it take from the time a problem is detected through the supervision until it gets resolved?

Whereas these areas are often murky when studied at the central level where spot testing or sampling must be used to exercise supervision, at the local level more opportunities are found to exercise detailed and more effective supervision.

Just as occurs in other areas, problems detected in supervisory activities through the assessment should spur an effective response that will correct them.

d) Access and use

Increasing access and use is an “intermediate goal” of the ARI control activities. Success in the area of access means the population will have greater opportunities to resolve health problems that affect the child; access means a greater supply of services offered to the community.

For its part, greater use of services means more likely and extensive utilization of this care. This is the most important indicator of whether the activities performed will have a real impact on the problem.

An assessment of access and use acts as a “quality control” check on the other assessments performed. This is because appropriate performance and a corresponding favorable assess-

ment in the areas of training, supplies, communication, and supervision should be reflected in an increase in access and use of the services that offer appropriate care for children with ARI. Access can be assessed according to the following indicators:

d.1) Proportion of health services prepared to offer standard ARI case management.

This indicator will reflect which health centers have trained staff, adequate antibiotic supply, and regular supervision of the standard ARI case management strategy. When personnel are trained, adequate supplies are available, and correct supervision is exercised, then the health centers with problems will be identified and their problems resolved. The supervisory process is the most accurate source of information used to develop this indicator. When supervision is appropriate, the centers listed as capable of offering standard ARI case management will in fact be doing so.

d.2) Proportion of the population in the health service area that practice standard ARI case management.

This is one of the most revealing of the indicators. The official in charge of health services in a given area must cover several health centers and types of personnel, which in turn are responsible for providing health care to the community. This indicator therefore reflects the activities conducted in the community and provides a check for the assessment. Just the same, however, frequently a large health center will not be able to accurately define the coverage area and population level it serves.

Unlike the other indicators, in this case the health centers to which the population has access must be those that effectively implement practice standard case management. To ensure this is the case, regular, appropriate supervision is required, not only to ascertain regular antibiotic supplies and the proper performance of trained personnel, but to ensure the proper practice of standard case management.

d.3) Proportion of mothers or relatives that know when to seek care from a health worker for a child with ARI.

This indicator gauges the mothers' awareness of the ARI problem, particularly with regard to childhood pneumonia. It reflects the level of success of communications efforts to increase this awareness and with it, efforts to seek care for the sick child. It also gives an indication of true access to the population; that is, leaving aside the features of transportation and geography, the indicator shows the "cultural access" to the strategy that mothers and other relatives of the child have.

This indicator is developed through community surveys in which mothers are questioned about their awareness of urgent warning signs of disease in the child, which should lead her to seek medical care at a health center. The signs that the mothers should recognize are the same ones that should be taught to the community either when they bring their children in to be seen or during special sessions designed for this purpose.

In addition, in countries where there is high demand for care and the level of concern is also high, it is important to also evaluate whether communication efforts result in fewer unnecessary appointments sought out for everyday matters, particularly in those centers intended to handle emergencies. Communication activities should be geared to increasing the number of medical visits in a rational manner (12).

Use of care can be assessed with the following indicator:

d.4) Effort to obtain care from a health worker for a child with ARI.

This indicator gauges the ratio between the total number of children with ARI who require a diagnosis and the number who are in fact taken to the doctor. It is an indicator of the use of the health services offering standard ARI case management by the mothers or other family members of pediatric patients. Whether the care that was actually provided was effective is another important question, given the reduction in mortality that the consultations can have.

This indicator is particularly comprehensive in assessing the progress from the entire set of activities undertaken, because greater effort by mothers to seek proper treatment is possible only when other elements are conducted in a well-coordinated manner.

Indirect information for this indicator can be obtained through household surveys in which the mother or other caretaker is asked about the signs the child exhibited during his or her last bout of respiratory disease and whether or not health services were sought.

The most sensitive phase in the entire process of the activities assessment is the calculation and detailed analysis of these indicators. A low level of access and use duly assessed using the indicators proposed above should immediately lead to a thorough analysis of the activities conducted in order to find out where the weaknesses lie.

III. ASSESSMENT OF IMPACT

This assessment is the most important step in verifying the success of the activities. To obtain a positive final result from ARI control activities, all efforts made must be guided by the objectives proposed at the onset—the reduction of harm in the community from ARI.

The framework for these objectives was put forth by the Pan American Health Organization with regard to its ARI control programs as follows (12):

- a) Reduce mortality from pneumonia in children under 5;
- b) Reduce the excessive and inappropriate use of antibiotics and other drugs in treating ARI;
- c) Reduce the complications from acute infections in the upper airways, particularly partial and total hearing impairment, secondary to acute otitis media.

The assessment of the level of accomplishment vis-à-vis these objectives is the most pertinent reflection of this process. The final purpose is to reduce specific health problems affecting the community and the human suffering they bring. At the same time, increased availability of health services means a better quality of life for the community. Thus, it should never be overlooked that the assessment of the impact of the health services is the most important of all; no other assessment will directly reflect true improvements in the health conditions of the population.

The minute and detailed study of activities is important, but is no substitute for thorough analysis of the impact. It is the relationship of the health inputs to health outcomes that needs to be established.

In certain circumstances, the absence of an analysis of impact is due to the difficulty in obtaining an assessment. The impact may be measured according to the proposed indicators during different time periods in which activities are conducted. And these may not translate into a measurable impact.

Nevertheless, every assessment should expressly state the impact anticipated and if the time frame following the implementation of activities is too brief to afford a measurable impact, the assessment can make note of the time constraint, so that at the appropriate time in the future, the issue can be studied.

At the local level, the time constraint should not be as great because of the ongoing monitoring of activities and the opportunity to assess individual cases.

Thus, the rules that apply at national or regional levels do not necessarily hold at the local level, where the impact of increased efforts can be tracked on a short-term basis, and goals, such as eliminating unnecessary deaths as a result of improper case management, are entirely feasible.

Not only can local planning, performance, and effective use of opportunities achieve optimum impact from available resources, but a more direct method of assessment and control are also possible at the local level, so problems detected can be quickly addressed.

The following are methodologies to assess the anticipated impact as set forth by the objectives of the activities. Specific indicators for each case are also provided.

a) Reductions in pneumonia mortality in children under 5.

Pneumonia mortality in children under 5 (which is the age group where the strategy is most effective) is the worst effect of all from ARI. Thus, the prevention of unnecessary deaths is the most important goal set for the activities.

Assessment of this impact requires a view of two fundamental aspects:

- the number of deaths produced; and
- the causes of their occurrence.

The number of deaths can be more reliably ascertained at the local level than on the national level. A survey of deaths should be taken to have the most current data possible. Information on deaths depends on the coordination of different data sources from local civil registries,

immediate notification from referral hospitals where deaths are common, data from community health workers, and other sources. Whatever methodology is used, all deaths should be reported within less than one month of the time they occur, and the mortality data should be examined for trends in causes, so that possible responses will be immediately forthcoming.

The characteristics of the deaths should be classified according to one of the following categories:

- Deaths that occur despite the use of effective standard case management and available technology (unavoidable deaths);
- Deaths that occur without the patient consulting health services (domestic death);
- Deaths that occur because the patient is not treated until his or her condition becomes severe (death due to delayed search for care);
- Deaths that occur after one or several patient visits with health worker(s), who fail to provide standard ARI case management.

This proposed scheme for classifying deaths attempts to determine the level of “responsibility” of the health services to specify weaknesses that may have contributed to or caused the deaths. The information can be gathered by local officials from records (e.g., clinical chart of hospitalized children who die) and community research and surveys.

It is important to make every effort to discriminate in the determination of the cause of death between the underlying cause and contributing factors or secondary causes. This is not always a simple matter, which is the reason that “undefined” is an important category. However, other information on pneumonia cases can be obtained such as basic and associated causes and whether infections had a nosocomial etiology or were secondary to other disease.

These assessments at the local level are among the most important activities conducted. It should be noted that these assessments will have a strong effect on the health personnel involved in the fatal cases, due to any awareness arising from the assessment of the role their actions played in the deaths. The purpose here, however, is not to assign blame, except in cases of negligence, but to reveal the current situation and the major problem areas that need to be addressed. Thus, the following indicator is proposed for local assessments to determine the impact on mortality of ARI control activities:

a.1) Individual analysis of deaths in children under 5 to determine the cause of death and actions taken to prevent it.

In general, the higher up the organizational ladder one travels in ARI control programs, the more difficult or impractical it becomes to assess individual cases. At the central level, the personnel have available the traditional tools of infant mortality, mortality in children under 5, and mortality from pneumonia in children under 5 and over 5. The study of these variables requires an analysis of the quality and reliability of the data, and their magnitude and evolution over time.

Although the quality of the data may not be the direct responsibility of those using it here, their input is critical to efforts to improve their content. A detailed awareness of the weakness and limitations in the data can contribute significantly to eventual improvements.

Undercounting and underreporting are not uniform in countries throughout the Region, many of which do a fine job. Thus, the assumption that the impact on mortality from ARI control efforts cannot be assessed because of problems in data quality should not be made without a prior evaluation to confirm the belief. Moreover, methodologies exist to adjust for undercounting or underreporting and they may provide a more accurate picture of the true situation.

With these constraints in mind, the following indicators are proposed for assessing the impact of ARI control activities at the central, national, or regional level.

a.2) Mortality from pneumonia in children under 1 year and 1-4 years or 5 years.

This indicator expresses the magnitude of the problem. Whenever possible, mortality figures from official records should be adjusted on the basis of available estimates of underreporting of deaths in each country. One of the reasons these adjustments are needed is that the goals of health programs are expressed in terms of the impact sought on specific kinds of mortality. And the situation as reflected in these magnitudes will largely determine the actions taken.

a.3) Mortality from all causes in children under 1 year and under 5 years.

This indicator reveals the ratio of pneumonia deaths to total deaths in each cohort, which are key data needed to establish the magnitude of the problem. This indicator can be used to check figures that suffer from classification problems to improve their accuracy.

a.4) Trends in mortality from pneumonia.*

The trend in mortality from pneumonia helps to define the magnitude of overall mortality. Average or even relatively low mortality from pneumonia should not give rise to complacency; if rates have been stable for some time, actions can still be taken to decrease the rates, and these actions should be reflected in declining trends.

For this purpose, indicators such as hospital lethality can be used, although in the early phases of a program this particular indicator is likely to appear high because severe cases are being properly referred. The percent of all infant mortality due to

* With regard to methods for calculating decreases in mortality from pneumonia or trends in other proposed indicators, see the PAHO publication *Acute respiratory infections in children in the Countries of the Americas: Mortality in the Andean area* (HMP/ARI-013/89).

pneumonia is another indicator that can reveal the impact of ARI control efforts.

These indicators should be routinely evaluated at all levels of national, intermediate, and local ARI control programs. Because impact cannot always be measured opportunistically, these surveillance efforts will afford much information about program progress.

Even though these data do not evaluate the program itself, the health personnel and community should be aware at all times of the characteristics and trends of the problem they are addressing.

b) Reduction in the excessive or inappropriate use of antibiotics and other ARI control drugs.

Reduction of needless use of these drugs is another program objective and should be reviewed regularly to assess impact. Although many of the same difficulties found at the central level in obtaining these data exist also at the local level, the status of the problem is more easily assessed locally. The following indicators are proposed for this area of assessment.

b.1) Proportion of ARI cases in children under 5 years that received antibiotic treatment from the health services.

This is the most comprehensive indicator of antibiotic use in the health services and measures antibiotic use in outpatient facilities and by patients of community health workers in those countries or areas where they are certified to prescribe antibiotics.

In planning ARI control activities, the objective is put forth in relation to the total number of ARI cases. Ordinary medical records do not always indicate the treatment prescribed. However, the supervision of health services can play an important role in this collection, whatever way it is carried out. Again, collection of this information at the local level is far simpler than at the national level.

Possible data sources include daily logs of medical visits (if treatment is listed), pediatric outpatient clinical histories, individual patient charts, supervisory reports, medical prescriptions presented to pharmacies, or any other records that allow the treatment provided to children who are diagnosed with ARI to be identified.

Generally speaking, an acceptable average proportion of patients with ARI who are treated with antibiotics is 20 to 30%. This range is the goal that ARI control programs should take on both a short- and long-term basis. If average prescription rates exceed this range, detailed analysis of potential problems should be conducted.

To begin, a determination should be made of the pathologies for which antibiotics are prescribed to find out whether excess medication is being prescribed for routine pathologies or if mistaken diagnoses are reached of pathologies that require antibiotic treatment. This information provides key feedback on areas that need reinforcement in training sessions and from supervisory activities.

Other potentially useful indicators of inappropriate or excessive antibiotic use are:

b.2) Proportion of cases of pneumonia or otitis media in children under 5 treated with antibiotics.

This indicator reflects whether pathologies that requiring antibiotic therapy are treated accordingly. The proportions should approach 100% (they may be less due to some cases being diagnosed after the fact).

b.3) ARI cases in children under 5, other than pneumonia and otitis media, treated with antibiotics.

This indicator reflects whether antibiotic use is excessive in viral and routine pathologies such as common cold and most pharyngitis. The proportion should be 20 to 30% or lower. Depending on the level responsible (physicians, nurses, or community health workers) higher proportions indicate the need for additional training to reinforce concepts concerning pathologies that do require antibiotic treatment, such as streptococcal pharyngitis.

b.4) Proportion of overall ARI in children under 5 represented by each pathology.

This indicator identifies whether the distribution of diagnoses is correct and whether severe pathologies that require antibiotic treatment are being overlooked. The general distribution of each pathology follows a relatively well-known pattern in which the vast majority of consultations are for routine pathologies, with pneumonia representing no more than 5% of the total and otitis media 20%.

Regardless of whether there is in fact a greater level of pneumonia and otitis media cases or classification problems are evident, the situation will warrant further review to reinforce personnel training, particularly areas of supervision and case assessment.

A close study of inadequate or excessive antibiotic use will help to resolve critical problems. Assessment of the reduction in antibiotic use is easier to measure than mortality-related data and can be tracked with the information forthcoming from the health centers or community health workers.

This information lends itself to simple graphic representations that can be shared with the entire health service staff to follow monthly trends. This technique has been successful in many countries where it has helped personnel to become strongly motivated in the accomplishment of related goals.

c) Reduction of complications from acute infections of the upper airways, especially hypoacusis and deafness secondary to otitis media.

Not many details are provided for this indicator, given that few countries have carried out specific activities for this objective. The lack of specific knowledge concerning this problem has prevented specific goals from becoming formulated, although some countries have attempted to define the basic situation through studies, while conducting activities for the appropriate management of acute and chronic otitis media.

Studies that attempt to track the prevalence of hypoacusis in the population and correlate it with histories of acute or chronic otitis media require complex efforts and special equipment for tympanometry to determine the extent of hearing loss. Many health services simply lack such equipment and its acquisition is overshadowed by other priorities.

To the degree that the prevalence of hypoacusis can be determined in the pediatric population and correlated to otitis media episodes, another component to control this problem can be established and subsequently assessed in the ARI program. At a minimum, this is an area that can be assessed a priori to indicate whether cases of otitis media are being properly treated. Tracking and treating otitis media would constitute a reasonable preliminary attempt to address the problem.

This component would be assessed using the following indicators:

c.1) Proportion of cases of acute otitis media in children under 5 that are properly handled.

Notwithstanding the problems in collecting reliable information, this indicator can be assessed indirectly. In the absence of numerical accuracy, a hypothesis that standard case management for acute otitis media contributes to reductions in the incidence of hypoacusis and deafness in the pediatric population is quite reasonable. Thus, an accounting should be made of the proportion of all cases of acute otitis media that receive antibiotic treatment.

c.2) Reduction of the cases of hypoacusis (annually or in other time frame) secondary to otitis media.

As is clear, accurate assessment of this indicator requires baseline information that is not easy to obtain in many countries. However, proper treatment of otitis media will certainly reduce hearing loss problems in the infant population and have a significant impact on the problem.

Tables 1 and 2 in the appendix of this chapter provide a list of proposed indicators for the assessment process as well as of the impact on the population. Calculation methods and data sources are also suggested.

IV. PRESENTATION OF THE ASSESSMENT AND PARTICIPATION OF HEALTH PERSONNEL IN THE PROCESSES OF MONITORING AND ASSESSMENT

How the results of monitoring and assessment are handled and how health personnel take part in discussing these results are every bit as important as the prior steps involved in the collection and tabulation of information on the process and its impact. Thus, whenever ARI control activities are assessed in a limited or comprehensive manner, the persons concerned must be brought into the process.

The participation of personnel can take many forms, including: meetings to review progress

in activities, updates and bulletins that publish results, integration of the results into the course materials used for personnel training, and conferences or seminars held by medical professionals during which results are examined and problems concerning scientific knowledge are discussed.

An assessment meeting held on at least an annual basis is essential to allow health personnel themselves an opportunity to show the results of their activities. During these meetings, the accomplishment of proposed goals is studied and related to the actual impact that has taken place. It is essential for the information to be presented, even when goals and objectives have not been achieved for the period in question. This procedure will allow personnel to feel that they are participants in the assessment process and enable them to examine the reasons that proposed goals have been missed. Not only should personnel participate who provide direct care for children with ARI, but supervisory staff and personnel responsible for the collection and management of records should also take part.

When these review sessions are held locally, it is important that higher-level officials at the regional or national level also attend. Regular reports to higher-level health officials are needed to keep them abreast of the course of ARI control activities, both progress made and problems encountered. This communication facilitates institutional support from higher management levels and engages them in the solution to problems where their assistance and intervention may be useful.

Finally, the review meetings should be followed up with a summary report that is distributed as broadly as possible among health personnel, community groups, and other organizations. This feedback will help make activities better known, earn them greater support, and fulfill the major objectives of the general assessment: to make known the progress of activities conducted, specify the shortfalls in the results anticipated, and evaluate the factors that need improvement to achieve the goals set forth.

V. REFERENCES

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Table 1. Indicators proposed for the “Assessment process” of ARI control activities

AREA	INDICATORS	CALCULATION	DATA SOURCE
TRAINING	<p>Proportion of health personnel trained in standard ARI case management</p> <p>Proportion of health services in area that have at least one staff member trained in standard ARI case management</p>	<p>Number of health personnel trained in standard ARI case management</p> <hr/> <p>Total number of health personnel working in the area</p> <p>Number of health services in area that have at least one staff member trained in standard ARI case management</p> <hr/> <p>Total number of health services in area</p>	<p>Numerator: list of those who have attended training sessions or courses during the period in question</p> <p>Denominator: list of all personnel in all health centers</p> <p>Numerator: list of those who have attended training sessions or courses, according to health center where they work</p> <p>Denominator: list of all health services in the area</p>
PROVISION OF SUPPLIES	<p>Proportion of health services in area that have regular supply of antibiotics</p> <p>Proportion of health services in area that have regular supply of other drugs</p> <p>Proportion of health services in area that have regular provision of other supplies</p>	<p>Number of health services in area that have regular adequate supply of antibiotics</p> <hr/> <p>Total number of health services in area</p> <p>Number of health services in area that have regular adequate supply of other drugs</p> <hr/> <p>Total number of health services in area</p> <p>Number of health services in area that have regular adequate provision of other supplies</p> <hr/> <p>Total number of health services in area</p>	<p>Numerator: the data sources for these indicators may be:</p> <ul style="list-style-type: none"> • If the supervision of the health services is regular and of good quality, this information should be provided directly in the supervisory reports, which should note the level of drugs and other inputs available. If these conditions are met, these reports will be the best way to demonstrate regular provision of these supplies. • If the supervision of the health services is not regular or is deficient, the most reliable source of this information may be the reports or records on the delivery of drugs and other supplies that the pharmaceutical or other divisions keep. Even though this information may not be as meaningful as a specific report on availability, it will be useful in calculating realistic estimates. <p>Denominator: list of area health services, as with the other three above indicators</p>

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Table 1. (continued)

AREA	INDICATORS	CALCULATION	DATA SOURCE
SUPERVISION	Proportion of health services in area that are regularly supervised	$\frac{\text{Number of health services in area that are regularly supervised}}{\text{Total number of health services in area}}$	<p>Numerator: supervisory reports on health centers in area</p> <p>Denominator: list of all health services in area</p>
ACCESS	<p>Proportion of health services in area that can offer standard ARI case management</p> <p>Proportion of population in area that have access to health services that offer standard ARI case management</p> <p>Proportion of mothers in area that know when to seek care from a health worker for a child with ARI</p>	$\frac{\text{Number of health services having trained personnel, adequate supplies, and regular supervision}}{\text{Total number of health services in area.}}$ $\frac{\text{Population of children under 5 covered by health services that use standard ARI case management}}{\text{Total population of children under 5 in area}}$ $\frac{\text{Mothers of children under 5 in area who recognize ARI danger signs that require them to seek professional care}}{\text{Total number of mothers of children under 5 in area.}}$	<p>Numerator: supervisory reports if they are done regularly and properly</p> <p>Denominator: list of all health services in area</p> <p>This is a composite indicator. Thus, the population of the service area must be calculated if it is not already known, and the corresponding services must be known. Once these two data are obtained, a calculation should be made first of the population covered by health services that provide standard case management for ARI (numerator) and then of the total population in the service area (denominator).</p> <p>The information for the latter may be found in local supervisory reports or surveys of the local services; the information for the numerator should be available as part of the basic information used by the services.</p> <p>To obtain the information to calculate this indicator, a household survey is needed that will determine mothers' knowledge of danger signs. The numerator is the number of mothers who respond correctly to the survey and the denominator is the total of mothers surveyed in the area</p>
USE	Attempt to obtain needed care for a child with ARI from a health worker	$\frac{\text{Number of children with ARI who should have received care from health service and were in fact taken to a service that provides standard case management}}{\text{Total number of children with ARI who should have received care from health personnel}}$	Calculation of this indicator requires a household survey that will determine the signs and symptoms of the child's last bout with ARI that required treatment and which children were brought to a service that provides standard ARI case management.

SOURCE: Pan American Health Organization. *Infecciones respiratorias agudas. Guía para la planificación, ejecución y evaluación de las actividades de control dentro de la atención de primaria de salud.* PAITEX Series for health program managers, No. 17. Pan American Health Organization. 1988.

Table 2. Proposed indicators for the “Impact assessment” of ARI control activities

AREA	INDICATORS	CALCULATION	DATA SOURCE
MORTALITY	<p>Individual analysis of deaths of children under 5</p> <p>Mortality from pneumonia in children under 1 year, 1-4 years, or under 5</p> <p>Mortality from all causes in children 1-4 years and under 5 years</p>	$\frac{\text{Number of pneumonia deaths in children under 1, 1-4, and under 5 years in the region in a given year}}{\text{Total population of children in the region in that year}}$ $\frac{\text{Total mortality in children under 1, 1-4, and under 5 years in the region in a given year}}{\text{Total population of children under 1, 1-4, and under 5 years in the region in a given year}}$	<p>The individual analysis of each death requires information on deaths in the region that can normally be obtained from hospital records, health service offices, civil registers, notaries, local courts and judges’ files, cemeteries, funeral parlors, and any other available source that records deaths.</p> <p>Numerator: the same data sources for deaths that is used above should be used here as well. In addition, health statistics at the regional and central level may be helpful.</p> <p>Denominator: Estimates and census data, preferably official, may also be used. If they are not available, data from health personnel or other institutions may be helpful.</p> <p>The data for both the numerator and denominator may come from the same sources mentioned above.</p>
ANTIBIOTIC USE	<p>Proportion of all ARI cases in children under 5 received in health services who were treated with antibiotics</p>	$\frac{\text{Number of all ARI cases in children under 5 received in health services who were treated with antibiotics in a given year.}}{\text{Number of all ARI cases in children under 5 received in health services in the same year.}}$	<p>The information for all the indicators in this area (ANTIBIOTIC USE) may be obtained from health service records, which should indicate the diagnosis for each case received and the type of treatment prescribed.</p> <p>These records can provide information to formulate the indicators in two main ways:</p> <p>a) Using ongoing information systems, either previously existing ones or those created specifically for this purpose. These systems allow data to be gathered regularly (on a monthly, bimonthly, or semester basis) to formulate the indicators.</p>

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Table 2. (continued)

AREA	INDICATORS	CALCULATION	DATA SOURCE
<p>ANTIBIOTIC USE (Continued)</p>	<p>Proportion of all pneumonia and acute otitis media cases in children under 5 received in health services who were treated with antibiotics.</p> <p>Proportion of all ARI cases other than pneumonia and acute otitis media in children under 5 received in health services and treated with antibiotics</p> <p>Proportion of each pathology in relation to total ARI cases in children under 5</p>	<p>Number of all pneumonia and acute otitis media cases in children under 5 received in health services who were treated with antibiotics</p> <hr/> <p>Number of all pneumonia and acute otitis media cases in children under 5 received in health services in the area in the same time period</p> <p>Number of all diagnosed cases, other than pneumonia and acute otitis media, in children under 5 received in area health services and receiving antibiotic treatment in a given year</p> <hr/> <p>Number of all diagnosed cases, other than pneumonia and acute otitis media, in children under 5 received in area health services in a given year</p> <p>Number of cases of each diagnosis in children under 5 received in health services in a given year</p> <hr/> <p>Number of all ARI cases in children under 5 received in health services in the same period</p>	<p>b) The supervisory reports, which should demonstrate that the supervisory guides provide for the retrospective review of records to practice case management.</p> <p>Any data source should include the patient's age, diagnosis, and treatment.</p>
<p>REDUCTION IN HYPOACUSIA</p>	<p>Proportion of cases of acute otitis media in children under 5 that are properly cared for</p>	<p>Number of cases of acute otitis media in children under 5 that are properly cared for</p> <hr/> <p>Total number of cases of acute otitis media in children under 5</p>	<p>The data sources for this indicator are the same ones used for tracking antibiotic use.</p>

SOURCE: Pan American Health Organization. *Infecciones respiratorias agudas. Guía para la planificación, ejecución y evaluación de las actividades de control dentro de la atención de primaria de salud.* PALTEX Series for health program managers, No. 17. Pan American Health Organization. 1988.

