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A Strategic Framework for Setting Priorities for Research, Analysis, and Information Dissemination for Integrated Case Management of the Sick Child in Africa

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Acronyms

AFR/SD/HRD	Bureau for Africa, Office of Sustainable Development, Human Resource and Democracy Division
AIDS	acquired immunodeficiency syndrome
CDC	Centers for Disease Control and Prevention
CDR	Program for the Control of Diarrhoeal and Acute Respiratory Illnesses (WHO)
HHRAA	Health and Human Resources Analysis for Africa
HIV	human immunodeficiency virus
SARA	Support for Analysis and Research in Africa
UNICEF	United Nations International Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Background

Activities and interventions to promote child survival are important priorities of the Agency for International Development's Africa Bureau. This is appropriate given that the countries with the highest infant and under-five mortality rates in the world are located in Africa (Hill 1992). High mortality rates coupled with high fertility rates mean that, in the 21st century, Africa will have a strikingly high share of the world's infant mortality. African ministries of health will need a great deal of institutional support to plan for and manage this demographic challenge and health care burden.

Child survival is an essential element of overall development strategies for African countries. Child illness decreases the economic productivity of parents and drains the limited financial resources of families. Malnutrition resulting from multiple and frequent illnesses can compromise the development and learning capacity of children. High infant and child rates mortality compel couples to maintain high birth rates to ensure the survival of a few healthy children. Thus, the capacity for future economic development is diminished by malnutrition and preventable childhood illnesses (Berg 1973).

The Africa Bureau's Child Survival Strategy emphasizes focused interventions (immunizations, diarrheal and acute respiratory disease control, malaria control, child spacing, nutrition counseling and AIDS prevention); strengthening integrated service delivery systems; and increasing the capacities of African governments for health planning and management. Although considerable progress has been made in these areas since the Bureau drafted its strategy in 1987, the impact on infant and child mortality has been less than hoped (Ewbank and Gribble 1993).

A number of factors have been identified as constraining the potential impact of child survival interventions. They include limited access to services; lack of effective targeting of interventions to those most in need; inadequate training of health professionals; poor community acceptance of interventions, logistical, management and infrastructure problems; and lack of coordination among programs resulting in competing agendas and missed opportunities for care and preventive measures (Gadomski et al. 1990). Health care workers and program managers with extensive experience in implementing disease-specific child survival interventions in sub-Saharan Africa have called for more effective integration of primary health

care services as a strategy for addressing some of these problems. Proponents of integration argue that a more comprehensive approach to health care services at the peripheral levels, combined with continued strong technical expertise in individual program areas at central levels, would allow for more efficient use of increasingly limited national and donor resources (Waldman et al. 1992).

In response to these issues and needs, a new clinical protocol for the Integrated Management of the Sick Child has been drafted jointly by WHO and UNICEF (World Health Organization and UNICEF 1993). It guides first level health care workers in assessment and management of diarrhea, acute respiratory infections, and fever, measles and malnutrition, as well as the associated conditions of otitis media, iron deficiency anemia, and acute eye problems associated with measles and vitamin A deficiency. The protocol addresses perceived problems with integration of multiple highly focused case management strategies at the service delivery level. Currently it applies to children from two months to five years of age although neonatal guidelines are under development.

It is hoped that this new formalized approach to treating the "whole child" will encourage the health care worker to apply more than one case management protocol when indicated, take advantage of opportunities for preventive action, and identify severely ill children rapidly and refer or appropriately manage them. By standardizing and specifying recommendations for home care and follow-up, the integrated approach may simplify and clarify messages about initial home management and facilitate communication between health care providers and users. If appropriate attention is paid to addressing the systems and logistics requirements of implementing the Integrated Management of the Sick Child algorithm, efficiency and economy should be achieved in training, supervision, logistics, and management of outpatient health facilities.

The Africa Bureau supports a standard approach to addressing the most common and important health problems of children presenting to primary care facilities. It views the protocol for the Integrated Management of the Sick Child, however, as one of a set of institutional, logistical, and managerial interventions needed to improve health facility case management. The Bureau also views these facility-based interventions as part of a broader strategy to improve comprehensive management of the sick child. This strategic framework for research and analysis, therefore, addresses the ini-

tial assessment and management of sick children at the household and community levels, as well as provision of effective and integrated health care in first level health facilities.

Like the WHO/UNICEF algorithm, the strategic framework focuses first on children from two months to five years of age. Research and analysis priorities for improving the management of neonates will be incorporated into the strategic framework as additional data related to this age group become available.

This framework for the ***Integrated Case Management of the Sick Child*** will be part of the Africa Bureau's comprehensive Child Survival Strategy. It will focus on case management of common childhood illnesses and certain aspects of disease prevention. It will complement other strategic frameworks for research and analysis, particularly those for health promotion and behavior change.

Purpose of the Strategic Framework

This strategic framework will define the priorities of the Office of Sustainable Development (SD) of the Africa Bureau and the Health and Human Resources Analysis for Africa (HHRAA) Project for supporting research, analysis, and information dissemination related to the sick child initiative.

The SD Office and the HHRAA Project emphasize supporting research, analysis, and dissemination activities that lead to improved policies, strategies, program/project design, implementation, and evaluation in health, nutrition, education, and population. Their purpose is to provide timely and appropriate information to USAID offices, African governments, and donors that will assist in setting priorities and allocating resources.

The analytic area related to the Integrated Management of the Sick Child initiative is an appropriate focus for SD and HHRAA. It contributes to the Africa Bureau's goal of increasing the effectiveness of resources (in this case, household and community resources, health care facilities, and personnel) available for African development. The movement toward integration of health care services for child survival has been seen by African ministries of health, USAID Missions, and donors as a way of coordinating the parallel but sometimes overlapping and sometimes competing efforts of different disease control programs. It is also seen as an opportunity to

streamline distribution, training, and supervision activities and to strengthen health services management. There is, therefore, great interest in the field to proceed rapidly with implementation of the WHO UNICEF Integrated Management of the Sick Child algorithm. Many questions must be addressed, however, prior to and during implementation. These questions concern all the areas of interest to SD and HHRAA: policies, strategies, intervention design, implementation, and evaluation. This provides SD and HHRAA with many opportunities to make substantial contributions to programmatic and operational decisions through collecting and disseminating information relevant to the Africa region.

Objectives of the Strategic Framework for the Sick Child Initiative

The principal objectives of the Africa Bureau's Child Survival Strategy are to reduce morbidity and mortality rates for Africa's under-five population and to strengthen the commitment and capacity of African governments and private institutions to undertake child survival initiatives (USAID Africa Bureau 1993). Proposed activities in the *Integrated Case Management of the Sick Child* analytic area directly address both of these objectives. Specifically, the objectives of research, analysis, and dissemination activities in this area are:

1. To improve the household and community management of common childhood illnesses with emphasis on fluid administration, continued feeding, administration of soothing home remedies, and recognition of signs and symptoms signaling a need for referral to a biomedical health worker.

2. To decrease childhood morbidity and mortality by improving the quality of care of common childhood illnesses at first-level health care facilities. This will be done by ensuring that each child seen for an acute illness:

    a) receives a minimal standard history and physical exam to assess the presenting problem and to detect concurrent problems and illnesses;

    b) receives appropriate care and counseling for the illnesses and problems identified, including the appropriate knowledge and skills needed for follow-up care at home; and

c) receives appropriate preventive interventions such as immunizations, vitamin A administration, and counseling on feeding practices.

3. To strengthen the training, supervision, and logistical support of first-level health workers to achieve and sustain this improved quality of care.

4. To identify and promote the institutional and managerial changes needed at different levels of the health care system to strengthen training, supervision, and logistics and thus facilitate this improved quality of care.

These objectives are consistent with the strategic objectives of the child survival and maternal health objective tree, and the nutrition objective tree which are "sustained increase in maternal and child health status," and "improved child and maternal nutrition status" respectively.

Information Needs and Gaps Related to the Integrated Case Management of the Sick Child

The information needs and gaps related to the Integrated Management of the Sick Child initiative were initially identified and summarized by Support for Analysis and Research in Africa (SARA) staff and a consultant who 1) reviewed the WHO/UNICEF document introducing the initiative (World Health Organization and UNICEF 1993); 2) attended the Washington-based meeting to present and discuss the initiative; 3) reviewed a draft list of clinical and behavioral questions identified by WHO as relevant to finalization of the sick child algorithm; 4) completed a review of the relevant literature; and 5) organized a meeting of interested parties at USAID. A preliminary document outlining general information needs was shared and discussed with colleagues at the Centers for Disease Control and Prevention (CDC) and with representatives of USAID's Africa Bureau and G/Health. The document was subsequently revised and reviewed with African nationals and representatives of international and donor organizations. The next step in the development of this framework will be to solicit input from USAID Missions and African public and private sector decision-makers.

The information needs and gaps identified through this process can be grouped into five categories:

- Studies related to defining and achieving the cognitive and behavior changes that are needed to improve recognition and appropriate management of sick children at the household and community levels.

- Clinical or epidemiologic research to improve or validate the algorithm for Integrated Management of the Sick Child at health facilities.

- Operational studies to a) identify and analyze the organizational, management, and behavioral changes necessary at different levels of the health care system to implement an integrated approach to the management of the sick child, and b) document and test approaches to achieving those changes.

- Documentation and assessment of different national approaches to implementing integrated care of sick children.

- Development of methodologies to adapt the algorithm to the local setting.

These information needs and gaps are described more specifically in the following subsections as are current studies and activities designed to meet those needs.

Studies related to defining and achieving the cognitive and behavior changes that are needed to improve the recognition and appropriate management of sick children at the household and community levels

Most episodes of illness in children are managed entirely at the household level. In many cases little or nothing is done except to observe the sick child for signs of a worsening condition. Initial interventions may involve traditional home remedies and/or pharmaceuticals obtained from local drug sellers. Illness episodes can lead to a variety of altered practices, some of which are helpful, some harmful, and some neutral. When caregivers decide to seek advice or help outside the home, their options often include more experienced caregivers, neighbors or relatives, traditional healers, injectionists, religious healers, and a variety of biomedical providers. A very small proportion of illness episodes are brought to the attention of public sector biomedical health workers.

Although many current practices are adequate or even quite helpful others may have adverse effects on morbidity and mortality. Caregivers may not recognize that certain symptoms of serious illness (such as rapid breathing) are abnormal, or they may feel that the symptoms do not merit concern. If they do recognize symptoms indicating serious illness, caregivers may respond with an inappropriate or inadequate intervention. They may seek care from inappropriate providers who are unaware of their own limitations. Caregivers who are aware of helpful interventions (such as the use of oral rehydration salts solution) or the need for referral, may face obstacles from family or community members to applying this knowledge.

Efforts to improve the overall household and community management of sick children must, therefore:

- describe and assess current practices to determine which are detrimental (and which advantageous or neutral) to child health and survival;
- determine which cognitive and behavioral changes are of highest priority; and
- design effective strategies for achieving priority cognitive and behavior changes.

A number of methodologies have been developed to improve the household management of childhood illnesses, particularly diarrhea (Rasmuson et al. 1988; Brown and Bentley 1988; Griffiths et al 1988) and acute respiratory infections (WHO 1992). One of the problems created by implementation of multiple disease oriented interventions, however, has been the proliferation of multiple and sometimes conflicting recommendations.

The challenge in developing an integrated approach to the sick child will be to extract a small number of key recommendations about the household management of common illnesses and conditions. Clinical and epidemiologic research is needed to determine which recommendations, when adopted by caregivers, lead to significant improvements over current practices in morbidity, mortality, or other desired outcomes (for example, the inappropriate use of antibiotics). These key recommendations must include a core set of signs and symptoms that, as recognized by caregivers, indicate the need for referral to a trained biomedical health care worker.

Studies to test the sensitivity and specificity of the core signs and symptoms in identifying children in need of referral will be important. Synthesis and comparison of results from different settings will be required to determine to what extent the key recommendations and core signs and symptoms must vary according to differing disease prevalence, cultural practices, or other local factors.

Communications research is needed on effective methods for teaching caregivers (particularly those with children at highest risk) with messages related to the integrated care of sick children. Creative strategies for motivating caregivers, families, and communities to adopt and sustain recommended practices must also be tested in different settings.

The costs and benefits of concentrating on changing community practices and standards by simultaneously intervening with a substantial proportion of health care providers (public and private) in a community should be explored. The community approach, although slower, may achieve more sustained improvements in practices than the approach of focusing on individual health workers who may feel powerless to implement change in the existing system. Testing and documentation of this would be extremely useful in designing and planning programs.

Clinical or epidemiologic research to improve or validate the algorithm for Integrated Management of the Sick Child at health facilities

The effectiveness of algorithms for clinical management of diarrhea and acute respiratory infections in reducing infant and child mortality rates has been demonstrated in a variety of clinical and cultural settings (WHO 1988b; Oberle et al. 1990; Chen et al. 1983; Sazawal and Black 1992). Adaptation of certain parts of these algorithms to the African setting, however, has yet to be achieved. Specifically, little and conflicting information exists about the effectiveness of current treatment guidelines for dysentery (diarrhea with blood) in outbreak and non-outbreak situations. Appropriate surveillance systems for monitoring the antibiotic resistance patterns of organisms causing bloody diarrhea must be developed and implemented. In addition, trials of appropriate dietary interventions for persistent diarrhea have not been completed in Africa. A multicentered study on management of persistent diarrhea has been completed, however, in other parts of the developing world. Results should be available within the next few months.

WHO has funded two studies (in Kenya and the Gambia) to test the overall performance of the Integrated Management of the Sick Child algorithm when applied by a medical officer trained in its use. The studies compare the diagnoses and treatment plans reached by the trained medical officer with the findings of an expert clinician using laboratory backup. Preliminary results suggest that the guidelines for assessing cough and diarrhea are satisfactory. There was a low sensitivity in identifying ear problems, but no reasonable alternatives were identified given the impracticality of providing otoscopes to all providers. The principal investigators (from CDC and the Medical Research Council) identified three problems of the algorithm: low specificity of the diagnosis of fever, low sensitivity of the referral criteria, and low sensitivity in diagnosing anemia (Zucker 1993; Mulholland 1993).

Research on the fever component of the algorithm is particularly important for Africa. It is estimated that 90 percent of the world's mortality due to malaria occurs in sub-Saharan Africa (Oaks et al. 1991). The Integrated Management of the Sick Child algorithm calls for presumptive treatment of malaria based on the presence of fever, a very non-specific sign. There are no data, however, to show a positive effect of presumptive treatment of malaria on mortality (Fabiani and Grabble 1993). A considerable amount of work is underway to improve the specificity of the case definition. The Tropical Disease Research Group and the Programme for the Control of Tropical Diseases of WHO are analyzing published and unpublished data on clinical predictors of malaria in low- and high-risk malaria areas. Researchers from CDC are conducting a study in Malawi (with funding from HHRAA) to further test the sensitivities and specificities of clinical signs to diagnose malaria and anemia. Unfortunately, preliminary results of a similar study in The Gambia suggest that a history of intermittent fever, sweats, or shaking does not improve the diagnostic accuracy (Mulholland 1993). CDC is also collaborating with the Aga Khan Foundation in Pakistan to evaluate the fever part of the algorithm in a setting with low malaria prevalence.

Further research is needed to test the sensitivity and specificity of different signs and symptoms for other conditions in the algorithm. The WHO's Programme for the Control of Diarrhoeal and Acute Respiratory Illnesses (CDR) is reviewing all published and unpublished data on the clinical predictors of severe anemia in young infants to determine the best combina-

tion of signs to use on the case management charts. There is some recent evidence that the observation of nailbed or palm crease palor increases the sensitivity of the physical examination (Zucker 1993). This needs to be tested among first level health care workers. The relationship between hemoglobin level and risk of mortality must also be better defined.

It is also not clear whether first level health care workers can be taught to recognize the signs of vitamin A deficiency (Bitot spots and corneal ulceration/clouding) using color photographs and printed training materials. The sensitivity and specificity of the danger signs for fever in identifying children with meningitis have yet to be measured. The criteria for identifying a child with measles (generalized rash, fever, cough, red eyes or runny nose) have not been tested in a clinical setting. In November 1993, WHO sponsored a meeting to define recommendations for and research needs concerning measles case management.

A fast and simple way to assess and classify nutritional status and to assess the performance of health care workers in identifying cases of moderate or severe malnutrition is needed. Dr. Ray Yip and his colleagues at CDC are assisting WHO with immediate development of nutrition assessment guidelines for the algorithm. WHO's Programme for the Control of Diarrhoeal and Acute Respiratory Illnesses (CDR) is testing the effectiveness of the nutritional advice for feeding children during and after illness in Mexico. The same group will soon be investigating the feasibility and effectiveness of training health workers to assess breast feeding in low weight for-age young infants and of training them to counsel mothers to solve key problems.

Clinical trials are also needed to test the efficacy of the prescribed interventions for these conditions. Developing treatment recommendations for malaria is particularly difficult given the increasing prevalence of falciparum malaria, which is resistant to chloroquine, and the development of resistance to second line drugs. In some settings, the appropriate management of moderate or severe anemia may involve treatment for intestinal parasites as well as iron. It is unclear whether iron treatment is appropriate during an acute illness or whether it may actually exacerbate the primary illness. Effective treatment for measles associated stomatitis has not yet been identified.

The Integrated Management of the Sick Child algorithm does not address children who are suspected of having acquired immunodeficiency syndrome (AIDS). Although AIDS is less common than the illnesses included in the algorithm, estimates of its contribution to infant and child deaths in Africa range from only about 3 percent (Hewbank and Gribble 1993) to 30 percent in certain areas (Chin 1990). In high prevalence areas different management approaches may be required for children with persistent diarrhea (a frequent clinical manifestation) or persistent cough (which may be an indication of tuberculosis). For the algorithm to be maximally useful in these high prevalence areas, the feasibility of incorporating case management guidelines for children with AIDS (currently under development by the Global Programme on AIDS) should be explored. Researchers from CDC are conducting a small study in Kenya to determine a group of questions that will identify children with human immunodeficiency virus (HIV) infection.

There has been considerable progress toward development of a case management algorithm for the sick neonate (zero to two months of age). Dr. Barbara Stoll (Emory University) will be providing information on the performance of an icterometer in the detection of jaundice in young infants. Data from the WHO multicenter study on the clinical signs and etiological agents in pneumonia, sepsis, and meningitis in young infants will also be available soon.

Ongoing studies indicate that coverage of the algorithm (the percent of children presenting to first level facilities with complaints or symptoms included in the chart) is good (Mulholland 1993; Zucker 1993). Further studies to test coverage are not a priority. The main problems that are not addressed are skin and localized infections. Inclusion of these problems should be considered if it will improve the algorithm's appeal and usefulness to health care providers.

Researchers at CDC recently completed a study of the performance of current criteria for hospital admission in identifying children at risk for death. Preliminary results indicate that additional work is needed to improve the sensitivity and specificity of the referral/hospitalization guidelines (Paxton et al. 1993). The same investigators are conducting a survey and observations in peripheral facilities to determine the percent of children who meet the criteria for referral to the next level of care.

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Operational studies to a) Identify and analyze the organizational, management, and behavioral changes necessary at different levels of the health care system to implement an integrated approach to the management of the sick child, and b) Document and test approaches to achieving those changes

Substantial evidence exists that most health workers in Africa, as well as other parts of the world, do not use health care encounters as opportunities to deliver preventive interventions such as immunizations (WHO 1988a) and nutrition counseling (Burns et al. 1990). Although the degree and extent of the problem are less clear, there is also some evidence that children with more than one health problem are not treated appropriately when they present to health facilities (Lee et al. 1992). Simply training health care workers in the use of an integrated algorithm, however, will not resolve these problems. In many health care centers, different services are available at different times or on different days. Charting and reporting systems may impede integrated case management. Patient flow patterns, scheduling, limited availability of essential drugs, and the physical organization of the facility may be other obstacles to providing comprehensive care. Most important, health care workers may view their responsibilities as limited to addressing the chief complaint. Preventive measures and health education are often delegated to others (Herman and Pryor Jones 1993).

There should be documentation and analysis of different approaches (successful and unsuccessful) to changing the behavior of individual health care workers. Where problems of missed opportunities and diagnoses exist, it is important to determine why health workers are not performing well and to understand what would motivate improvement. To achieve that behavior change, it is necessary to identify the benefits of current practices and the perceived benefits of and barriers to the new behavior. Different approaches to selling the idea of integrated care of the sick child and to reinforcing and sustaining improved practices must be pilot tested.

Similarly, efforts to improve supervision must extend beyond the development of checklists and focus on the development of problem solving skills. The supervisors of health care workers will not perform well unless they are effectively supervised. Different approaches to intervening in the chain of supervision and different incentives for adopting recommended behaviors should be explored and documented. Also, mechanisms must be developed and tested to ensure the supply and appropriate use of essential

drugs and other supplies necessary to implement the Integrated Management of the Sick Child algorithm.

Research is also needed on the format of the case management poster. Are first-level health care workers (with different degrees of literacy) able and willing to follow it? Do health workers prefer or are they more likely to use different types of materials? Are certain ways of introducing the poster (or other format) during training and supervisory sessions more effective than others?

Successful efforts to integrate health services have followed a process of systems change involving analysis of current treatment practices and patient flow patterns, negotiation of new approaches with the individuals involved, team building, planning, training, and reassessing/evaluating (Walley et al. 1991). One of the most critical decisions is to determine where and how to intervene in a complex system. Individual health facilities seldom have the authority to change policies and procedures significantly. Ministries of health and national programs are too far removed from implementation to affect practical changes. Working through district-level management may be most effective in achieving desired changes, but this will require considerable strengthening of decentralized planning and management (Vaughan and Smith 1986).

The ultimate indicators of whether the initiative achieves its goals will be infant and child morbidity and mortality rates. It will take years and considerable resources, however, to measure the impact of the initiative on these rates. Other indicators and instruments to measure them must be developed to give more timely feedback on the effectiveness of implementing the initiative. These include changes in health services use, quality of care, and user satisfaction. Do health workers trained in use of the algorithm miss fewer opportunities for immunization and for treatment of underlying problems (malnutrition, anemia, and vitamin A deficiency)? Are they more likely to detect and address concurrent illnesses? Do they demonstrate an improvement in their interaction with caregivers? Does use of the algorithm decrease needless prescription of drugs? It would also be important to develop indicators to assess whether there have been improvements in logistics and management and increased efficiency in training and supervision.

The activities of other donors in operations research have been more limited than activities related to validation of the algorithm. The Quality Assurance Project is conducting a study in Kenya that involves a systematic observation of health worker practices using the WHO case management algorithm as a gold standard. The CDC International Health Program Office has submitted a proposal to HHRAA to assess current health worker practices (using the WHO protocol as a gold standard), determine obstacles to and ways of facilitating implementation of integrated care of the sick child, and implement the integrated approach followed by an evaluation.

In summary, the topics included under operational or implementation studies are:

- developing effective methods for achieving and sustaining behavior change among health care providers;
- identifying mechanisms for reorganizing health facilities so that they support an integrated approach to the care of sick children;
- testing strategies to strengthen administrative and managerial capabilities at the district level as well as the health facility level to achieve the supervision and logistics improvements that are necessary to support integrated care; and
- developing indicators and instruments to evaluate progress toward achieving the goals of the integrated approach.

Documentation and assessment of different approaches to implementing the Integrated Management of the Sick Child

The Integrated Management of the Sick Child initiative and algorithm are conceptionally rational and appealing. Implementing them, however, will involve considerable personnel, time, and resource costs. The implementation process will involve a variety of programmatic decisions from the ministry of health level (for example, where and with whom to place authority and responsibility for integration) to the health facility level (for example, how to ensure the continuous availability of all necessary services). Different countries will likely choose different implementation models. Both the costs incurred and the improvements achieved with different approaches must be measured (or estimated) and documented.

The most immediate need will be for guidelines on policy formulation and planning for countries choosing to pilot test the initiative. Tools are needed to help countries assess current policies related to the components of the Integrated Management of the Sick Child algorithm, level of training of health care workers in these components, strength of management and supervision skills to support the initiative, and adequacy of essential drug budgets and distribution systems. These tools should assist countries to prioritize implementation needs and sequence interventions appropriately.

The development of methodologies and guidelines to adapt the approach to the local setting

Many parts of the Integrated Management of the Sick Child approach must be adapted to local conditions and resources, and may also need revision. Mechanisms and methodologies will be needed to guide this adaptation and revision. Clearly, key messages for caregivers about the initial management and assessment of sick children must reflect local disease prevalence, culture-specific practices related to caring for sick children, caregivers' ability to recognize danger signs, and local classification and terminology of illness. Communication strategies must reflect existing resources and the availability and reach of different channels.

Certain aspects of the case management algorithm for health facilities will also require adaptation. Guidelines for management of fever will vary according to the prevalence of malaria (particularly falciparum) and the emergence of drug resistance. The recommended management of anemia may vary according to the relative importance of malaria and intestinal parasites. The first line of therapy for dysentery and pneumonia will change as patterns of drug resistance change. In areas or facilities with a high prevalence of AIDS, other adaptations of the algorithm might be indicated. It will also be necessary to adapt the recommendations for referral and hospitalization to settings with different degrees of access to secondary and tertiary care facilities. WHO is working on guidelines for adapting the algorithm to local settings and conditions.

Prioritization of Information Needs

Several criteria have been used to establish the priorities of the Office of Sustainable Development (SD) of the Africa Bureau and of the Health and

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Human Resources Analysis for Africa (HHRAA) Project in supporting research, analysis, and information dissemination related to the Integrated Management of the Sick Child initiative. A key consideration has been USAID's comparative advantage, particularly as it complements the strengths and activities of other donor organizations. USAID's comparative advantage lies in its working relationships with ministries of health through the field staff of its Missions, projects, and programs. It also lies in the fact that its priorities as a development agency are not limited to implementing programs, but also include programmatic activities to build capacity within developing countries.

USAID's field presence and relationships, and thus its ability to provide direct and timely assistance to ministries, argues for an emphasis on operational implementation studies and activities, particularly those outlined in Sections above. This priority is especially appropriate as most of the studies and activities underway and planned by other donors relate to validation of the case management algorithm. USAID can also draw on the experience of a variety of its implementation projects (HealthCom, Combatting Childhood Communicable Diseases, PRITECH, REACH, the Health Care Financing Project, the Quality Assurance Project, etc.) to design and conduct priority research and analysis activities in this area.

Within operational implementation studies, priority will be given to questions or activities with direct relevance to programmatic decisions that will be faced at the early stages of implementing the initiative. These will include development of assessment tools and policy and planning guidelines for governments proceeding to adopt an integrated approach to the care of sick children. The SD Office and the HHRAA Project will also be interested in supporting documentation and analysis of different approaches to implementation of the Integrated Management of the Sick Child initiative on a national level. Priority will also be given to studies or interventions that strengthen health care delivery systems and increase the capacity of African governments for health planning and management. Thus, studies and activities to improve the supply and rational use of essential drugs, strengthen supervisory skills and procedures, and achieve and sustain improved clinical and communication skills among health workers will be encouraged.

Achieving desired improvements in the care of sick children at the community and household levels is an enormous and extremely important task.

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The SD Office and the HHRAA Project are therefore drafting a separate strategic framework related to behavior change. The current strategic framework for research and analysis related to the Integrated Management of the Sick Child initiative, therefore, will limit household and community level research to issues of compliance with recommendations made in the context of a health facility visit for an illness episode.

In summary, the research and analysis priorities of the SD Office and the HHRAA Project will focus on operational studies to identify and achieve the organizational, management, and behavioral changes necessary at different levels of the health care system to implement an integrated approach to management of the sick child, and on documentation and assessment of different national approaches to implementing the integrated care of sick children. Consideration will be given to providing funds for clinical or epidemiologic studies to validate the algorithm when they are of particular regional interest to Africa. However, SD and HHRAA will not actively solicit or plan studies of this type.

Research, Analysis, and Dissemination Priorities

The most pressing research and analysis needs under the headings of operational research and documentation of national approaches were identified during discussions within USAID and with other donors. These priorities, and possible approaches to addressing them are summarized below.

Developing effective methods of achieving sustained behavior change among health care workers

In most settings implementing an integrated approach to caring for sick children will require significant changes in the behavior of health care providers. Improvements will likely be needed in compliance with following a clinical algorithm, prescribing practices, and counseling skills. Although a wealth of programmatic experience exists in attempting to change health worker behavior, there has been little systematic research or analysis of programmatic experiences on the topic. Most studies or evaluations focus on the effectiveness of training or describing the multiple problems impeding behavior change.

Perhaps the most pressing need is for articulation of an analytic model of health worker behavior change based on existing data and program experience. The model can be used to define the research questions that are most relevant to program decisions and to guide the design of interventions. Just as it has been argued that behavioral intervention research at the community level should be theory-driven (Stanton et al. 1992), it is important to base activities related to health worker behavior change on behavioral science theories. This will ensure comprehensive consideration of the multiple and complex factors affecting behavior and will also advance the field of behavioral intervention research.

Possible collaborators in developing an analytic model and identifying specific research and analysis priorities include the HealthCom Project, the Quality Assurance Project, and university faculty with interests in this area.

Identifying mechanisms to improve the supply of essential drugs

The effectiveness of the clinical algorithm for the Integrated Management of the Sick Child depends on the availability of a small number of essential drugs. Problems of funding, procurement, distribution, and inappropriate use, however, lead to frequent and recurrent stock-outs in most developing countries.

Of necessity, individual disease control programs have tried to improve the supply of essential drugs through changes in policy and laws, restructuring of distribution systems, implementation of cost-recovery systems, and training of health care providers. There is a need to draw on the experiences of these different programs to develop a systematic approach through which countries can solve the drug supply problem. Possible collaborators in this effort include individuals at Management Sciences for Health, the PATH project, the Health Care Financing project and REACH (BASICS).

Experimenting with different strategies to maximize the effectiveness of supervision

Individual disease control programs have found provision of effective supervision to be an enormous challenge. Although integrated supervision holds the promise of reducing the overall costs of supervision, it increases the difficulty of the task. The supervisor of integrated care must be able to assess a much broader range of health worker skills, provide ongoing training related to multiple illnesses, and solve a wider variety of problems.

Work is needed to identify the most important components of the supervisory visit so that ineffective tasks can be eliminated. Supervisors need high-quality training in case management, interpersonal communication skills, and problem solving. Simple systems must be developed to track supervisory visits so that problems receive follow-up and all important topics are covered over a specified period of time.

Possible collaborators in this area include the Quality Assurance project, HealthCom, and the PRITECH and REACH projects (now BASICS).

Identifying simple ways to facilitate the compliance of caregivers with advice received during health facility encounters

Provision of comprehensive, integrated care implies treating multiple illnesses or conditions when they occur, and offering preventive services such as immunizations and nutrition counseling. This complicates the health worker's task of providing effective face-to-face communication, and increases the amount of information that a caregiver is expected to absorb.

Work is needed to verify the minimal necessary components of effective face-to-face communication. It would be important to know if the use of simple, pictorial counseling cards improves caregiver understanding and retention of information. It would also be useful to estimate the maximum amount of information that can be communicated during one visit and to develop strategies (for example home visits or return visits) to present additional information.

The degree of caregiver compliance with recommendations received in developing country health facilities should be documented. Alternative ways of supporting recommended behaviors and improving compliance should be explored.

Possible collaborators in this area include HealthCom, Management Sciences for Health, and the Quality Assurance Project.

Developing an assessment tool for countries planning to implement Integrated Management of Sick Children

The minimal requirements necessary for implementing integrated care of sick children have yet to be defined. The costs of doing so have not been estimated. Clearly, this information is critical to the planning process of

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countries choosing to implement the Integrated Management of the Sick Child initiative.

Guidelines are needed for assessing the key components of integrated care, estimating budgetary and personnel requirements, and planning an appropriate sequence of interventions. These guidelines might be drafted with the assistance of the Health Care Financing project and with university faculty interested and experienced in this area.

Describing the costs and outcomes of different national approaches to implementing Integrated Management of Sick Children

The WHO/UNICEF clinical algorithm makes operational the concept of integration at the service delivery level. A great deal of thought and effort, however, needs to be applied to making integration operational at the level of ministries of health, provinces, and districts. For example, it is assumed that there will continue to be strong technical expertise in individual disease program areas at the ministries of health level. It is unclear, however, how individual program personnel will interact to achieve integrated planning, management, training, supervision, and support. The decisions that will be faced in the transition to an integrated system have yet to be defined and assessed.

Therefore, it is important to conduct process evaluations of early attempts to implement an integrated approach to care of the sick child. This conceptualization and conduct of these evaluations might be appropriately done in collaboration with university groups interested in health systems.

Recommendations of Research, Analysis, and Dissemination Activities

The initiation of research, analysis, and dissemination activities related to implementation need not wait until the case management algorithm is finalized. The activities related to adapting health facilities and strengthening health systems to facilitate an integrated approach to case management do not depend on the existence of a finalized algorithm and should precede its introduction. Further, given the issues of emerging drug resistance and changing epidemiology of disease, the algorithm will likely be evolving continuously.

Many individuals and organizations will be working on different aspects of the Integrated Management of the Sick Child Initiative. Many of the experiences and much of the information will never appear in the published literature. Establishment of a clearinghouse for collecting, summarizing, translating, and distributing protocols, studies, analyses, and experiences would help to make the information readily available to decision makers.

Monitoring and Evaluation Framework

It will be critical to evaluate the research, analysis, and dissemination activities in themselves. Different countries will be at different phases in implementing the Integrated Management of the Sick Child initiative. Research efforts should not be duplicated, nor should unproductive study designs be repeated.

All research and analysis activities will be monitored by the USAID Bureau for Africa (AFR/SD/HRD) along several parameters. In writing research and/or analysis proposals, authors will be required to articulate the program questions that will be answered by the research as well as the program decisions that should be based on it. The extent to which the research answers the questions and assists with making decisions will be addressed in the final study report. Individuals asked to review the reports (decision makers in the ministry of health, WHO, and HHRAA technical advisors) will be asked to assess whether the research results addressed the questions and decisions identified, and whether it is necessary or desirable for other countries implementing the algorithm to repeat the research or analyses. Reviewers will also be asked to comment on recommended changes in the design or focus of similar analysis or research. The SARA research coordinator will also maintain communications with African ministry of health officials to determine the impact of the research on policies and program decisions.

This evaluation of research and analysis activities will be summarized in the project's annual report.

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