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Q.A.

THE QUALITY ASSURANCE PROJECT

APPLIED RESEARCH IN CHILD SURVIVAL SERVICES

ASSESSMENT OF HEALTH WORKER PRACTICES IN THE MANAGEMENT OF SICK CHILDREN IN SIAYA DISTRICT KENYA

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SUMMARY OF FINDINGS

WHO has developed an algorithm for the integrated evaluation and treatment of sick children two to 59 months old. The algorithm constitutes a set of standards for the case management of diarrheal disease, fever, acute respiratory infection, malaria, measles, ear problems and nutritional deficiencies for use in entry-level health facilities. The algorithm also requires that health worker assess each child's immunization status, as well as providing guidance on counseling the caretaker. This integrated algorithm was developed in recognition of the need for a more cost effective approach to providing curative and preventive services for children presenting at primary care health facilities. CDC, with support from WHO, evaluating the sensitivity and specificity of the new integrated algorithm in Siaya District Hospital. At the request of CDC, the Quality Assurance Project agreed to conduct an assessment in a representative sample of rural health facilities, within Siaya District, in order to compare actual practices with those suggested in the integrated algorithm. The purpose of this assessment was to provide insights into operational issues regarding adoption of the algorithrn as standard practice in Siaya and elsewhere.

The facility-based assessment described in this report provides some key findings related to health worker practices in managing sick children 2 to 59 months, and about preventive services offered these children during their curative care. In addition, the assessment documented the situation with regard to drugs and supplies essential to adequately manage sick children. Data were collected from 19 rural MOH health facilities, including 7 health centers and 12 rural dispensaries. A total of 4 clinical officers, 13 enrolled community nurses and 2 support staff were observed treating sick children. The findings described in this report are not evaluation results, but the results of an assessment aimed at providing managers with the facts they need to initiate improvement strategies.

Of the 234 observed patients, 56% had cough, 27% had diarrhoea, 76% had fever and 3% complained of ear problems. In very few cases were children checked for the key danger signs: inability to drink, history of convulsions or lethargy.

The correct case management of diarrhoea could be improved. Inquiry about the presence of blood in the stool was done in only 17% (11/64) of the cases presenting with diarrhoea. Few children with diarrhoea (5/64) had their skin turgor checked and only 48% (31/64) were prescribed ORS. Nine health facilities were without ORS the day of the visit.

One of the problems identified from a prior study conducted in Siaya under another USAID-funded Project, the Measles Initiative, was the reluctance of health workers to immunize sick children. In only 51% of cases observed during this study was the immunization status of the child verified. Of these, 41% were referred for immunization. Health workers checked weight for age in 36% (83/232) of children. Missed opportunities for both immunization and nutritional counseling are likely to occur when monitoring is not done routinely.

Explanations of how to administer medicines were given to the mothers in the majority of cases. In general, however, counseling was very limited. In only 6% of cases did the health worker or dispenser verify that the mother had understood instructions on how to administer medications. Few mothers were counseled about giving food or fluids to their sick children. Danger signs, which signal to a mother that she should return her child to the health center immediately, were explained to only one mother. Thirty-three percent of mothers interviewed either said they would not return before the medication was finished or did not know when to return.

While appropriate diagnostic and counseling skills are essential, an adequate drug supply is critical to ensuring a good outcome. Nearly all the patients (230/234) had one or more medications prescribed. Caretakers were able to obtain prescriptions at the health center in only 21% (48/230) of encounters. Eleven of the 19 facilities reported that in the 12 months prior to the study, they had been out of between 4 and 8 essential drugs for a period ranging between 3 and 12 months.

1.0 INTRODUCTION

CDC with support from CDR/WHO is conducting a validation study of the sensitivity and specificity of the newly developed sick child algorithm and its associated wall-chart in Siaya District Hospital, Nyanza Province. In conjunction with this study, CDC requested that the Quality Assurance Project[1] (QAP) design and conduct a facility-based assessment in Siaya District rural health facilities of current health worker practices in the case management of sick children. In response to CDC's request, QAP developed a protocol and conducted the assessment in September-October 1993. The assessment technique used is a method for systematically identifying program weaknesses which inhibit delivery of quality care. This approach uses a systems framework to assess what is actually occurring in the delivery of services and in carrying out essential support activities.

A key activity within any health care system is to define the essential tasks that a health worker must perform to provide proper care and essential activities that must take place to support service delivery. The sick child algorithm provides such a set of standards for child health care. Disease-specific algorithms have been introduced by WHO in the past and indications are that implementation of these algorithms does not meet expectations in terms of worker compliance.

The integrated sick child algorithm is essentially a flowchart that guides a health care provider through a systematic history and physical designed to assess the patient for signs and symptoms of acute respiratory infection (ARI), diarrhoeal disease, malaria, measles, ear problems, and malnutrition. It incorporates reminders to check the child's immunization status and spells out particularly dangerous symptoms that should lead to a referral for more skilled care to a higher-level health care facility in the system. The flow of signs and symptoms is designed to lead to a diagnosis and a treatment plan, as well as a specific set of counseling messages. It is best seen in the form of a flowchart similar to those developed by WHO for the single programs on ARI and CDD (control of diarrhoeal disease). The sick child algorithm incorporates and integrates those two algorithms and adds algorithm components to facilitate diagnosis of malaria and measles. Figure 1 shows key assessment and classification elements of the algorithm. (As a result of ongoing field-testing for sensitivity and specificity, the algorithm is in a state of flux; since the assessment, this June 1993 version has been slightly modified.)

It is assumed that, following the current evaluation and refinement at Siaya District Hospital, in the Gambia, and elsewhere, the algorithm will be disseminated as a tool for maximizing the effectiveness of auxiliary providers. If this is the case, then these data, in conjunction with the data produced in CDC/WHO's validation study, may provide rough estimates of the degree to which adoption of the algorithm could logically be expected to improve outcomes as a result of more accurate diagnoses and more effective treatment plans. In addition, the analysis will provide insights into operational issues that service system managers and trainers may encounter once the algorithm is adopted as standard practice, as well as affording early ideas regarding the nature of job aids and supervision that may be useful in facilitating compliance with the algorithm.

2.0 GOAL AND OBJECTIVES

The data from this facility-based assessment were used to compare current practice in diagnosing and treating sick children between the ages of two months and 5 years with the case management guidelines suggested by the sick child algorithm presented in WHO's latest wall-chart being tested by CDC in Siaya District Hospital. The goal of this assessment was to compare current with ideal practice in the

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[1]*The Quality Assurance Project is funded under the U.S. Agency for International Development*

FIGURE 1

Key Assessment and Classification Elements of the WHO/UNICEF Sick Child Algorithm

Assess the Sick Child *(Age 2 Months up to 5 Years)*	Classify the Illness
Check the child's general condition: **Ask:** • Is the child able to drink? • Has the child had convulsions? **Look:** • See if the child is: well, alert; restless, irritable; or abnormally sleepy or difficult to wake.	**If danger sign is present:** • Not able to drink, • Convulsions, or • Abnormally sleepy or difficult to wake. **Refer Urgently to Hospital**
Then ask: **Is the child coughing?** **If yes, look, listen, then feel:** • Count the breaths in one minute. • Look for chest indrawing. • Look and listen for stridor.	**Classify Cough** • **Severe Pneumonia or Very Severe Disease** • **Pneumonia** • **No Pneumonia: cough or cold**
Does the child have diarrhoea? **If yes, ask:** • Is there blood in the stool? • When did this episode of diarrhoea begin? **If the child has diarrhoea:** • Look for sunken or dry eyes. • Look for tears. • Offer a drink- - *Is the child thirsty?* - *Does the child drink eagerly?* • Look and feel whether the child's mouth and tongue are moist or dry. • Pinch the skin of abdomen or thigh- - *Does it go back quickly, slowly, or very slowly (longer than 2 seconds)?*	**Classify Diarrhoea** • **Severe Dehydration** • **Some Dehydration** • **No Dehydration**
Has the child had fever? **If yes, ask:** • For how long? • Is the fever intermittent? • Has the child had chills, sweats, or shaking? • Is the child vomiting? If yes, how long? **If the child has had fever:** • Feel the child for high fever (or measure temperature). • Flex the neck, is it stiff? • *Look for red, immobile ear drum by otoscopy.* • Does the child have a rash? If yes: - *Is the rash generalized?* - *Does the child have a runny nose or red eyes?* - *Look for mouth ulcers.* - *Look for pus draining from the eye.* - *Look for white spot on cornea or clouding.*	**Classify Fever** • **Fever With Danger Signs of Very Severe Disease** • **Malaria** • **Malaria Unlikely** **Classify Measles** • **Measles With Danger Signs** • **Complicated Measles** • **Uncomplicated Measles**
Does the child have ear pain or discharge? **If the child has ear pain or discharge:** • Look for pus draining from the ear. • Look for red, immobile ear drum by otoscopy. • Feel for tender swelling behind the ear.	**Classify Ear Problem** • **Mastoiditis** • **Ear Infection** • **No Ear Infection**
Then check the child's nutritional status: • Weigh the child. • Calculate weight-for-age. • Look for eyelid pallor. • Look for foamy patches on white of the eye. • Look for severe wasting. • Look for oedema of the hands and feet. **Then check the child's immunization status:** • Immunize if needed.	**Classify Nutritional Status** • **Severe Malnutrition** • **Malnutrition** • **No Malnutrition**

V

management of sick children in order to describe the operational issues surrounding the broad application of this model. The specific objectives of the assessment were established as follows:

- Describe current practices by Siaya District health workers in the diagnosis and treatment of children between 2 months and 5 years old for the major complaints associated with leading causes of childhood mortality and morbidity (cough, diarrhoea, fever, and ear pain);
- Describe the performance of these workers with regard to preventive measures taken during encounters with sick children (i.e., immunization and malnutrition);
- Describe the quality of counseling provided to caretakers of sick children;
- Assess the availability of essential equipment and supplies required to adequately diagnose and treat sick children presenting at rural health clinics.

3.0 METHODOLOGY

Data were obtained by structured observation of interactions between workers and children and their caretakers. Supplemental data were gathered by interviewing the workers themselves and the mothers of children being treated, as well as by conducting reviews of records, equipment, and supplies available at each facility included in the assessment. The focus of this analysis was on the performance of clinical officers (COS) and Enrolled Community Nurses (ECNs) working in rural health facilities (health centers and dispensaries); it is they who actually provide the bulk of curative services to children in Siaya District. Since it was assumed that in each facility only one health worker is designated to see sick children on a given day, the sampling frame focused on an appropriate selection of sites rather than of workers. Only Ministry of Health facilities were considered in this study; although there are a number of private service centers in the District, the great majority of care is provided by the public sector.

3.1 Sampling Frame

MOH facilities that serve children in Siaya District comprise seven health centers and 27 dispensaries. A clinical officer oversees care at a health center, an enrolled community nurse at a dispensary. Data were collected from a total of 19 rural health facilities, seven health centers and twelve dispensaries. Criteria used for selecting sites was based on availability of service data, outpatient volume of more than 650 patients per month, and geographic distribution. All seven MOH health centers were included in the sample, and 12 of the 14 dispensaries which met the selection criteria. Of the two facilities not used in the study, one site was used for the pretest and the second was too distant to be included in the sample. The facilities included in the sample were located in 9 of the 10 divisions in Siaya District. Each health worker seeing children the day of the visit was observed for the entire day.

3.2 Data Collection Procedures

Field instruments

The clinical observation checklist was developed based on the clinical standards set forth in the sick child algorithm. The checklist covered in a closed-end format all the signs and symptoms required by the algorithm and recorded the worker's diagnosis and proposed treatment. It also documented the content and technique of counseling. (An additional checklist was used to observe counseling provided caretakers when collecting prescriptions from the dispenser at the pharmacy.) At the end of the observed encounter, an open-ended query was made to get information on the factors the

worker used to arrive at the diagnosis. This was intended to capture factors not anticipated in the closed-end observation. The items included in the checklist were derived from all of the tasks listed or implied in the sick child algorithm. In addition, instruments to conduct provider interviews and interviews with caretakers, and checklists to verify equipment and supplies as well as the medical records (reporting) system were developed. Information was gathered from clinical supervisors on the content, method, and frequency of clinical supervision of COs and nurses. In addition, exit interviews were conducted to determine whether or not the caretakers understood the messages the health workers (or in many cases, the dispensers) had attempted to communicate. A checklist was used to assess the status of equipment and supplies deemed necessary for effective diagnosis and treatment of the specific problems covered by the sick child algorithm. Data collection instruments were prepared in FormTool, a software specially developed for creating forms. The instruments (Appendix A) were tested and refined simultaneously with the training of the field staff.

Field Staff

The data collection was managed by a QAP staff person on site. The Kenya Medical Research Institute's field station outside Kisumu, 45 km from Siaya District Hospital, seconded two of its research staff to collect data for the duration of the study. These two individuals temporarily relocated to Siaya District and with the QAP field manager formed the team. KEMRI also provided a computer and staff person for data entry. A Peace Corps volunteer based in Siaya assisted with double entry of the data.

Field Procedures

The data collection team was trained in the use of the standardized checklist to record observations of health workers performing tasks relating to case management (taking history, doing physical examinations, classifying, providing treatment, and counseling) and in conducting exit interviews with caretakers. The QAP staff person was present to oversee data collection procedures and to conduct the provider interviews and verify availability of equipment and supplies and record keeping at each center. The QAP staff person also gathered relevant information about components of the system such as supervision of service delivery, basic and in-service training, and logistics which are key to supporting the service delivery activities. It was important to convey that the purpose of the assessment was not an evaluation of worker performance but a necessary step in the development of an integrated approach to managing sick children, to ensure that the team was allowed to assess close to normal performance. The entire assessment activity, including training and pretesting of the instruments took approximately 5 weeks. (One facility per day=19 days collecting data.) A schedule of visits was established based on the number of rural health facilities to be visited during the assessment. Each day that data were collected, the team proceeded to the scheduled facility before the workers began to see patients. The team explained the purpose and procedure of the assessment and together with the facility staff determine the best timing and placement for each survey activity.

4.0 DATA ANALYSIS AND DISCUSSION

The 19 facilities yielded 234 case observations (children between two and 59 months), 234 caretaker exit interviews, and 19 supplies and equipment checklists completed. Tables 1 and 2 provide the types of health workers observed and a list of the rural health facilities included in the study.

Table 1. Health workers observed, by title

Title	Number
Clinical Officer	4
Enrolled Community Nurse	13
Support Worker (non-clinical)	2
Total	19

Table 2. List of facilities, by type and location

Facility	Number	Location
Health Center	6	Nyawara Bondo Madiany Ndere Sigomere Ukwala
Sub-district Hospital	1	Yala
Dispensary	12	Kadengue Ratuoro Hawinga Rwambwa Rabar Kogelo Ligega Tingare Malanga Usigu Abidha Ongielo Gobei
Total	19	

(Boro and Sikalame Dispensaries were also visited, but not included in the sample. Boro was used in the pretest and training phase and Sikalame had no patients the day of the visit.)

4.1 Health Worker Performance Data Analysis and Discussion

Presentation of the Data

Details of the health worker performance assessment data are presented in figure 2. The data are presented in this matrix format to provide an opportunity for the reader to scan the entire dataset in desegregate form to buttress some of the points in the subsequent discussion. Because denominators are relatively small in many of the cells of the array, data are presented as numerators

FIGURE 2

SIAYA HEALTH WORKER PERFORMANCE ASSESSMENT

	CO1	CO2	CO3	CO4	ECN1	ECN2	ECN3	ECN4	ECN5	ECN6	ECN7	ECN8	ECN9	ECN1	ECN1	ECN1	ECN1	SW1	SW2	TOTAL
DANGER SIGNS																				
Checked if unable drink	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Checked for convulsions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Checked for lethargy	2	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	5
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Referred to hospital	0	0	*	0	0	*	*	*	*	*	0	*	*	*	*	*	*	0	0	0
	2	1	*	1	1	*	*	*	*	*	1	*	*	*	*	*	*	1	1	8
If referred, gave correct first treatm	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CHECKED FOR COUGH																				
Presented	20	10	2	6	3	4	4	4	3	5	11	16	2	6	4	4	10	5	4	123
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Asked	1	2	4	6	1	0	1	0	1	1	3	1	*	4	0	2	1	0	1	29
	9	9	8	9	5	4	7	5	6	4	6	13		5	2	7	4	5	3	111
Child had cough:	20	10	4	8	3	4	4	4	3	6	13	16	2	6	4	5	10	5	4	131
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Raised shirt	17	4	4	8	1	2	0	4	3	6	5	15	2	6	3	1	10	2	3	96
	20	10	4	8	3	4	4	4	3	6	13	16	2	6	4	5	10	5	4	131
Counted respiratory rate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20	10	4	8	3	4	4	4	3	6	13	16	2	6	4	5	10	5	4	131
Checked for indrawing	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	4
	12	9	1	7	3	1	4	2	2	2	12	13	1	3	4	5	5	5	3	94
Looked/listened for stridor	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	9	8	1	5	3	1	4	2	1	4	13	11	2	3	2	5	2	4	2	82
Listened with stethoscope	9	4	3	7	0	1	0	3	2	0	3	14	2	4	2	0	10	1	1	66
	20	10	4	8	3	4	4	4	3	6	13	16	2	6	4	5	10	5	4	131
																				0
CHECKED FOR DIARRHEA																				
Presented	12	6	2	6	2	2	3	0	3	1	6	2	0	2	0	7	3	2	2	61
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Asked	1	0	6	5	4	0	2	0	0	1	1	1	1	0	0	0	0	0	2	24
	17	13	8	9	6	6	8	9	6	8	11	27	2	9	6	4	11	8	5	173
Child had diarrhea:	12	6	3	6	3	2	4	0	3	1	6	2	0	2	0	7	3	2	2	64
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Asked about blood in stool	1	1	0	3	3	0	0	*	1	0	0	0	*	1	*	1	0	0	0	11
	12	6	3	6	3	2	4		3	1	6	2		2		7	3	2	2	64
Asked duration	1	2	0	6	3	0	2		0	1	4	1		2		2	3	1	0	28
	12	6	3	6	3	2	4		3	1	6	2		2		7	3	2	2	64
Checked for dry eyes	5	0	1	5	2	2	1		1	1	2	1		0		0	3	0	1	25
	12	6	3	6	3	2	4		3	1	6	2		2		7	3	2	2	64
Checked for dry mouth	2	0	1	4	0	1	0		0	1	1	2		0		0	0	0	0	12
	12	6	3	6	3	2	4		3	1	6	2		2		7	3	2	2	64
Checked ability to drink	0	0	0	0	0	0	0		0	0	0	0		0		0	0	0	0	0
	12	6	3	6	3	2	4		3	1	6	2		2		7	3	2	2	64
Checked skin turgor	1	0	0	0	1	0	0		0	0	0	0		0		0	3	0	0	5
	12	6	3	6	3	2	4		3	1	6	2		2		7	3	2	2	64

SIAYA HEALTH WORKER PERFORMANCE ASSESSMENT

CHECKED FOR FEVER																				
Presented	24	17	5	11	6	5	6	5	6	6	17	21	1	10	6	9	7	5	7	174
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Checked	0	0	0	3	1	0	2	0	0	1	*	2	1	0	*	0	0	3	*	13
	5	2	5	4	2	3	5	4	3	3		8	1	1		2	7	5		60
Child had fever:	24	17	5	12	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	178
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Asked duration	12	11	4	11	3	0	0	4	3	3	17	13	1	9	5	0	5	2	5	108
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
Asked if intermittent	0	0	0	1	0	0	2	0	0	1	0	2	1	0	0	0	0	1	1	9
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
Asked if chills/sweats/shaking	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
Asked if vomiting	1	1	2	4	2	0	0	0	0	3	0	2	0	0	0	0	0	3	3	21
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
Asked duration	1	2	2	2	0	0	0	1	0	1	3	0	0	0	0	0	1	0	2	15
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
Flexed neck	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
Examined for rash	3	0	0	3	5	1	3	2	0	1	0	2	0	0	2	0	1	0	2	25
	21	14	2	8	5	2	7	3	5	2	17	16	1	10	4	9	3	5	7	141
Examined eyes	2	0	1	4	0	0	0	3	1	3	0	2	0	0	0	0	3	0	4	23
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
Examined mouth	0	0	1	5	0	0	0	0	0	1	0	1	1	0	0	0	0	0	2	11
	24	17	5	11	7	5	7	5	6	6	17	21	1	10	6	9	7	6	7	177
CHECKED FOR EAR PROBLEM																				
Presented	2	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	7
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Asked	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27	19	9	14	8	8	11	9	9	9	17	28	2	11	6	11	13	10	6	227
Child had ear problem:	2	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	7
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Checked for pain	0	*	0	0	*	*	*	*	*	*	*	0	*	*	*	*	0	*	0	0
	2		1	1								1					1		1	7
Checked for discharge	0		0	1								1					1		0	3
	2		1	1								1					1		1	7
Asked duration of discharge	0		1	0								0					1		0	2
	2		1	1								1					1		1	7
Examined inside ears	0		0	0								0					0		0	0
	2		1	1								1					1		1	7
Checked behind ears	0		1	1								0					1		0	3
	2		1	1								1					1		1	7

FIGURE 2 - Continued

FIGURE 2 - Continued

SIAYA HEALTH WORKER PERFORMANCE ASSESSMENT

CHECKED NUTRITION STATUS																				
Child weighed	27	15	8	15	0	7	10	9	0	9	16	28	2	0	5	9	14	0	0	174
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Weight recorded	27	15	8	14	0	0	10	9	0	9	16	28	2	0	5	9	14	0	0	166
	27	15	8	15	0	7	10	9	0	9	16	28	2	0	5	9	14	0	0	174
Card checked for weight/age	11	1	4	14	0	6	1	5	0	7	12	2	2	0	4	0	14	0	0	103
	29	19	10	15	8	8	9	9	9	9	17	29	2	11	6	11	14	10	7	232
Checked eyelid pallor	21	7	7	14	0	7	3	8	4	7	9	22	2	8	5	0	12	3	3	142
	29	19	9	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	233
Checked cornea	2	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	8
	20	16	6	3	8	2	10	9	4	7	16	17	2	7	4	11	6	8	5	161
Checked for wasting	4	0	3	1	0	0	0	0	0	1	0	2	0	0	0	0	6	0	0	17
	23	18	9	7	8	3	10	4	6	7	17	22	2	8	2	11	8	9	4	178
Checked for edema	3	0	3	1	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	11
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
COUNSELING (PROVIDER)																				
Tell mother return if danger signs	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	29	19	10	15	6	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Tell mother return if other signs	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Tell supportive treatment	0	0	2	2	3	1	0	0	0	1	4	0	0	0	6	0	1	0	1	21
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Continue breastfeeding	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	2
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Continue foods	1	0	2	2	2	0	0	0	0	0	4	1	0	0	0	0	2	1	0	15
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Continue fluids	0	0	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0	0	3	8
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Explained medicine administration	3	0	1	0	7	0	9	7	2	0	14	1	0	0	1	0	1	8	4	58
	29	19	10	15	8	8	11	9	9	9	17	29	2	11	6	11	14	10	7	234
Verified that mother understood dire	1	•	0	•	0	•	0	0	0	•	2	0	•	•	0	•	0	0	0	3
	3		1		7		9	7	2		14	1			1		1	8	4	58
COUNSELING (DISPENSER)																				
Continue breastfeeding	0	0	0	1	•	1	0	0	0	0	0	1	0	0	0	0	0	•	0	3
	29	18	10	15		8	11	9	9	9	17	29	2	11	6	11	14		7	216
Continue foods	0	0	1	2		0	0	0	0	0	2	1	0	1	0	1	0		0	8
	29	19	10	15		8	11	9	9	9	17	29	2	11	6	11	14		7	216
Continue fluids	0	0	1	3		1	0	1	1	0	2	2	0	1	0	1	0		0	13
	29	19	10	15		8	11	9	9	9	17	29	2	11	6	11	14		7	216
Explained medicine administration	19	17	9	15		4	1	9	8	9	12	28	2	10	6	11	10		4	174
	29	19	0	15		8	11	9	9	9	17	29	2	11	6	11	14		7	216
Verified that mother understood dire	0	0	0	0		0	0	7	0	0	2	0	1	0	0	0	0		0	10
	19	17	9	15		4	1	9	8	9	12	28	2	10	6	11	10		4	174
OTHER																				
Checked immunization status	18	1	6	14	0	1	9	5	0	7	13	18	2	0	4	0	14	2	6	120
	29	19	10	15	8	8	11	9	9	9	19	29	2	11	6	11	14	10	7	236
Referred for vaccination	6	0	0	2	0	0	0	2	0	3	0	18	2	0	2	0	14	0	0	49
	29	19	10	15	8	7	11	9	9	9	19	29	2	11	6	11	14	10	7	236

and denominators rather than as percentages, which we feel in many cases would be somewhat misleading if the reader were to attempt to compare one health worker with another on any one performance indicator.

As noted earlier, 234 patient/provider encounters were observed. In the sections on cough, diarrhoea, fever, and ear problem, the indicator "presented" represents the number of children whose mother (or other person who brought the child to the facility) gave that symptom to the provider as one of the reasons for bringing the child. The indicator "asked" represents the number of mothers who did not offer that complaint who, in accordance with the algorithm, then were specifically asked about it by the worker. The "child had ....." indicator represents the combination of those who actually presented plus those who, having been asked, *probably* responded affirmatively. The definition of "probably" is those mothers who were asked by the health worker <u>and</u> gave that symptom as a reason for coming to the facility at their exit interview. As may be seen, for cough 29 were asked and 8 probably responded affirmatively, for diarrhoea 24 were asked and 3 probably responded affirmatively, and for fever 13 were asked or checked and 4 probably responded affirmatively. In the case of ear problems, no mother who did not present the child with this complaint was asked about it. Denominators for subsequent indicators in the section (for example, "raised shirt" in the cough section) were predicated on the number of children who probably had that complaint. This is the numerator for the indicator "child had .....": 131 for cough, 64 for diarrhoea, 178 for fever, and 7 for ear problems. Where denominators are less than these values, this is a consequence of either missing data--an infrequent occurrence--or the inability of the observer to state with certainty that a particular action was taken or not taken. An asterisk indicates that the indicator is not applicable.

The headings "CO_n", "ECN_n", and "SW_n" stand respectively for the Clinical Officer, Enrolled Community Nurse, and Support Worker (non-clinical). The latter is, of course, not normally a health care provider in Kenya, but the fact is that on the day when the team visited two centers, it was this worker who was providing service.

<u>General Comments:</u> Presentation of the data in the matrix format allow us to observe several interesting characteristics of the workers' overall performance. First, as a group there are some actions (corresponding to an indicator on the matrix) that workers are more likely to take than others. They are more likely, for example, to use a stethoscope on a child with cough than to count respiration rate, or to check for dry eyes in a diarrhoea patient than to check skin turgor. Second, some workers perform key tasks more frequently than do other workers. This is not unexpected; knowledge and skills and their application might be expected to vary among workers. But third, and perhaps more interesting, is the variability within each health worker's performance on many indicators. It might have been assumed that a given worker either generally performs a certain task or generally does not. In the array, however, many cases may be observed of a health worker sometimes carrying out a particular action and sometimes not. Asking about blood in the stool of a diarrhoea patient is a good example, in which we see such results as once in 12 times, three times in 6, and once in 3. In the case of checking for eyelid pallor, we see 21 times out of 29 patients, 7 out of 19, 3 out of 11, and 9 out of 17. Ideally, workers should do these things consistently, so one aspect of worker performance that may have to be investigated more thoroughly is how and why workers decide to take a particular action with some patients but not with others.

Another point of interest with probable implications for training and for promotion of compliance with standards is the apparent minimal--if any--difference between the performance of clinical officers and enrolled community nurses, despite their different levels of training.

Following is a summary of results. More details and the variation by worker may be seen in the data matrix. Highlights of results are also given in figures 3 to 8.

FIGURE 3

PROVIDER PERFORMANCE

- ☑ Workers rarely check for key danger signs (lethargy, convulsions, ability to drink)
- ☑ About half checked for immunization status
- ☑ Workers do not appear to be very consistent within each worker with regard to either carrying out an action or failing to do so
- ☑ Clinical officers do not appear to perform appreciably better than ECNs

PROVIDER PERFORMANCE

DEALING WITH COUGH

- ☑ 53% of children presented with cough
- ☑ Only 26% (29/111) of those who did not present with cough were asked about cough
- ☑ Of those 29, 8 (28%) probably responded affirmatively
- ☑ 73% of children's shirt was raised by the worker--but we're not sure why
- ☑ No one counted a child's respiratory rate
- ☑ But out of 94 cases where the observer was fairly sure, 4 appeared to be checked for indrawing
- ☑ In 50% of cases, worker listened with a stethoscope--for what?

FIGURE 4

FIGURE 5

PROVIDER PERFORMANCE DEALING WITH DIARRHEA

- ☑ 26% presented with diarrhea
- ☑ 14% (24) of the remaining 173 were asked about diarrhea
- ☑ 17% (4) of the 24 asked <u>probably</u> responded affirmatively
- ☑ Of the 64 with diarrhea:
  - ✔ 17% (11) were asked about blood in stool
  - ✔ 44% (28) were asked about duration
  - ✔ 39% (25) were checked for dry eyes
  - ✔ 20% (13) were checked for dry mouth
  - ✔ 8% (5) were checked for skin turgor
  - ✔ None were asked about ability to drink

FIGURE 6

PROVIDER PERFORMANCE

DEALING WITH FEVER

- ☑ 74% (174/234) presented with fever
- ☑ 22% (13) of the remaining 60 were asked about fever
- ☑ 31% (4) <u>probably</u> responded affirmatively
- ☑ Of the 178 cases with fever:
  - ✓ 4% (8) were asked about duration
  - ✓ 12% (21/177) were asked about vomiting
  - ✓ None were asked about chills/sweats/shaking
  - ✓ In only 1 case was the neck flexed
  - ✓ 18% (25/138) of cases were examined for rash
  - ✓ 13% (23/178) had their eyes checked
  - ✓ 6% (11/178) had their mouth checked

FIGURE 7

PROVIDER PERFORMANCE

CHECKING NUTRITION STATUS

- ☑ 74% (174) of children were weighed
- ☑ 5% (8) of weights were <u>not</u> recorded
- ☑ 36% (83/232) of children had their nutrition status checked
- ☑ 61% (142/233) were checked for eyelid pallor
- ☑ 5% (8/161) had their corneas checked
- ☑ 10% (17/178) of children were overtly examined for wasting
- ☑ 5% (11/234) of children were checked for edema

PROVIDER PERFORMANCE

COUNSELING

- ☑ Only 1 mother was told about danger signs and the need to return
- ☑ Fewer than 5% of mothers were told to maintain breastfeeding and/or fluids
- ☑ More than 80% were told how to administer prescribed medicines, but--
- ☑ In only about 5% of cases was any attempt made to assure that the mother understood the explanation

FIGURE 8

Danger Signs: Health workers checked for any severe danger sign (inability to drink, history of convulsions, or lethargy) in only 8 of the 234 cases. None of those children were referred to hospital, but our data do not allow us to know if any of them had a danger sign and thus should have been referred according to the algorithm.

Immunization. Records of 51% of the children were checked by the worker to determine immunization status; 41% of those children were then referred for vaccination.

Dealing with Cough: Fifty-three percent of children presented with cough. Although the algorithm would call for all of the other children to be queried for cough, the workers asked only 26% (29) of mothers of the other 11[illegible] if the child had cough in addition to its other symptoms. Based on our approach to reckoning how many of these 29 probably would have responded affirmatively, another 8 children (28% of those asked) were added to the original presenting 123. In 66 of the 131 cases the health worker listened to the child's chest with a stethoscope, including one case each by the two support workers. No stethoscope was used at four centers, even though three had functional instruments on hand. (What is not clear, however, is what information the workers were seeking by listening.) Four different workers checked for indrawing in one each of the 94 cases where the observer felt fairly certain of what was happening. On the other hand, no worker counted a child's respiratory rate, a key indicator of pneumonia in both the integrated algorithm and the stand-alone ARI algorithm.

Dealing with Diarrhoea: Twenty-six percent of children presented with diarrhoea. Of the remaining 173, only 14% (24) were queried about diarrhoea. Four of the 173 probably would have responded affirmatively, making a total of 64 children with a complaint of diarrhoea. Caretakers of only 11% of these children were asked if they had noticed blood in the child's stool. This important indicator illustrates the variability of performance within and between providers. One ECN asked the question of all three of her patients, but others asked it only sporadically, with one of the clinical officers asking in three of his six patients. Workers were not very consistent about checking for dehydration: 39% of cases were checked for dry eyes, 20% for dry mouth, and only 8% for poor skin turgor (the latter comprises five cases, of which three were attributable to one ECN who checked turgor in all three of her patients). The duration of the problem was asked in only 44% of cases.

Dealing with Fever: Seventy-four percent (174) of children presented with fever. Of the other 60 children, the worker checked for, or inquired about, fever in 22% (13 cases). Of those 13 cases, four probably did have fever, making a total of 178 children seen with fever. In most of these cases, the worker did not differentiate between possible measles, malaria, or other febrile illness. For example, only one child's neck was tested for stiffness, and 12% (21) were asked about vomiting. The observers were fairly certain about whether or not the worker looked for a rash in 137 cases: 18% (25) did. Thirteen percent (23/177) did check the child's eyes, though it was not possible to tell if the worker was checking for conjunctival reddening, drainage, spots or all of those signs. Six percent (11) of the children's mouths were checked. It should be noted that the version of the WHO integrated case management algorithm used as the "ideal" standard in this study was an early version and has since had minor revisions. For example, questioning a mother about the pattern of fever or chills and sweating has not proven to be a good predictor of malaria and has been dropped from the current version of the algorithm. Therefore, the fact that very few health workers pursued this line of questioning is not significant to correctly diagnosing malaria.

Dealing with Ear Problems: Three percent (7) of children presented with an ear problem. None of the other 227 were checked for an ear problem. Of the seven, three were checked for discharge, but none for pain. The workers checked three children behind the ear, presumably for tenderness.

Checking for Malnutrition: Seventy-four percent (174) of the children were weighed at the health center, but 5% of weights were not recorded. Workers checked the child's weight-for-age in 36% (83/232) of cases and for anemia (manifest by pallid eyelids) in 61% of cases (142/233). Corneas were clearly examined in only 5% of cases, but more may have been included as the worker checked for eyelid pallor. Edema was checked in 5% of cases (11) and wasting--a somewhat difficult check for an observer to determine since it may amount to a quick glance--in 10% (17/178).

Counseling: Counseling, whether provided by the health worker or, as in some cases, by the dispenser, was limited. The exception was instructions to the mother regarding how to administer prescribed medicines. Eighty-one percent (174/216) of prescriptions filled by the dispenser were accompanied by an explanation of how to administer the medicine. On the other hand, only 6% (10/174) of dispensers who explained its administration sought to verify that the mother understood those instructions. For providers, the corresponding figure was 7% (4/58). In addition, fewer than 10% of mothers were told to continue breastfeeding or other foods and fluids, and only one mother was told about danger signs that should prompt an immediate return to the center and one mother (a different one) was told about other signs, such as failure to improve in a few days, that should bring the child back to the center.

4.2 Diagnosis and Treatment

Diagnosis and Treatment: Of 131 children who presented with cough, the final assigned diagnoses were pneumonia (7), bronchitis (2), upper respiratory tract infection (60), not recorded (18), and the remaining non-respiratory. Two of the pneumonia patients were not treated with antibiotics and the other 5 and the 2 bronchitis patients were treated with penicillin. The recommended treatment by the sick child algorithm is either trimethoprim + sulfamethoxazole (T/S) or amoxycillin for pneumonia.

Of 64 children with a complaint of diarrhoea, 18 (28%) were given a final diarrhoea-related diagnosis and of these 12 were given ORS. Of all 64 children with diarrhoea 31 (48%) were prescribed ORS treatment. Two patients were diagnosed with dysentery and were prescribed appropriately with T/S.

Of 178 children with fever, 135 were prescribed chloroquine and 109 were given a diagnosis of malaria. Of the children given a diagnosis of malaria, 99 were prescribed treatment with chloroquine and 5 were prescribed Fansidar (P/S). A total of 33 children not diagnosed with malaria, or for whom a diagnosis was not recorded, were prescribed chloroquine. Twenty-one children not complaining of fever were diagnosed as having malaria, and 18 of them were prescribed chloroquine. In 10 cases children presenting with fever were not recorded as having malaria but were prescribed chloroquine. Two cases with unrecorded diagnoses and without fever complaint were prescribed chloroquine.

Seven children were identified with an ear problem; 5 of whom had a final diagnosis assigned. Of these 5, 2 had otitis media and were prescribed penicillin. Treatment prescribed by the sick child algorithm would have been T/S.

Arriving at the Diagnosis: Workers were asked how they arrived at their final diagnosis. The responses suggest that the health workers primarily relied on clinical history to make a diagnosis. Physical examination and results from laboratory tests played a secondary role. For example, of 20 children that health workers said had pneumonia (only 7 children were recorded as having pneumonia), a contributing factor to the diagnosis was the chest exam in 11 (55%) cases. Similarly, 5 of the 109 malaria diagnoses (with a complaint of fever) were based on a positive laboratory result and 9 cases on a documented elevated temperature.

4.3 Caretakers' Knowledge/Practices

At the exit interview, in 166 cases (71%) mothers said they were not told the diagnosis for their child. Of the 220 mothers who responded to the question, 190 (86%) said they would return if their child did not improve. However, 72 (33%) either said they would not return until the medication was finished or did not know when to return. One or more medications was prescribed in nearly every case seen (230/234). However, in only 48 (21%) of the visits was the mother able to obtain all the prescribed medications from the facility.

4.4 Essential Drugs, Supplies and Equipment

Prolonged drug shortages at the national level were having a severe impact on drug availability in Siaya District MOH rural health facilities at the time of this assessment. The most obvious consequence was a significant decrease in utilization of clinic services. Actual numbers of patients found in the course of the study visits were much lower than expected based on service statistics recorded in the District Medical Records Office for the several months preceding the study. A decline in the use of EPI services due to drug shortages also had been reported in the findings of the AID-funded Measles Initiative Baseline Assessment. Of the 19 health facilities visited, 8 had no chloroquine, 7 had no penicillin, 16 had no T/S, 9 had no ORS, and none of the facilities had Fansidar in stock. All facilities had experienced drug shortages in the last 12 months. Sixteen health facilities out of 19 reported shortages of one or more drugs for a period of at least 3 months. Eleven of these facilities reported 4 to 8 essential drugs missing for a period of 3-12 months, as of the day of the visit.

Most centers had functional basic equipment such as stethoscopes (18/19), scales (17/19), sterilizers (18/19), and cold storage equipment (16/19). However, only 2 health facilities had a functioning otoscope. Limited laboratory service was available in 6 of the 7 health centers and in one larger dispensary. Seven out of the 19 facilities had a functioning microscope. Urinalysis was available in 6 centers, blood smears were available in 5 centers, hemoglobin counts in 2, stool exam in 5, and AFB and Widal tests each were available in two facilities. Each site with lab services complained of serious shortages of supplies. Items such as slides, alcohol, lancets, and stains were out of stock on the day of the visit, alcohol and lancets being the most frequent items missing. Other supplies noted as out of stock were vaccines in 3 centers and child health cards in 11 centers. Sixteen of the facilities sampled reported shortages in the last 12 months for one or more supply item.

Unreliable water supply is a widespread problem in Siaya MOH facilities. The day of the visit, 4 out of 19 centers reported a non-functioning water supply. Nearly every facility complained of a water problem of some sort. Electricity was operational in only 2 of the 19 facilities. A summary of the findings above is provided in figure 9.

4.5 Support Systems

Training: It is important to note that this assessment was not an evaluation of health worker performance vis a vis an algorithm they had been trained to use. Most had received training on the CDD algorithm but not the ARI algorithm, and none, of course, had ever been exposed to the sick child algorithm. The existence of standards and guidelines provide health workers and supervisors clarity about expected performance. Numerous attempts were made to find explicit clinical guidelines for clinical officers and enrolled community nurses in the management of sick children. Hand copied notes from a CO's training program, a brief outline of required skills issued by the Clinical Officers Council, and the March 1990 edition of the "Handbook for Rural Health Workers" were the only documents approaching clinical guidelines to be found. None could be considered satisfactory for communicating clear standards of how care should be given. Kenya has adopted WHO case

ESSENTIAL DRUGS, SUPPLIES AND EQUIPMENT

- ☑ of the 19 RHF visited:
  - ✓ 11 had Chloroquine
  - ✓ 12 had Penicillin
  - ✓ 3 had Septrin
  - ✓ 10 had ORS
  - ✓ 0 had Fansidar
- ☑ 19/19 experienced drug stockouts of one or more drugs in prior 12 months
- ☑ 11/19 RHF reported 4-8 drugs missing for 3-12 months
- ☑ 2/19 had functioning otoscope
- ☑ 7/19 had functioning microscope
- ☑ each site (7/19) with lab services available complained of serious supply shortages
- ☑ 4/19 had no water (all complained of water problems)
- ☑ 2/19 facilities had electricity

FIGURE 9

management guidelines for CDD and ARI and has done extensive training in at least the CDD algorithm. However, neither CDD nor ARI wall-charts were found in any of the clinics visited.

Supervision: Supervision is important to ensuring technical quality, motivating personnel and solving problems. Clinical supervision from the district level to the periphery is not routine. Members of the District Health Management Team are designated as supervisors, but visits made to the rural health facilities often are devoted to resupply and administrative issues, rarely focusing on clinical aspects of care.

Information system/medical records: To determine the sites to include in the sample, a review of service statistics for each facility was done at the District level. A significant number of facilities did not have data available for one or more months prior to the study. When data were available, data specific to under five services were not segregated. As the team began visiting the selected sites it became evident that the number of patients reported in medical records in the three months prior to the study was in many cases much higher than the number found during the visits. It was necessary to re-evaluate what would be the lower parameter for patient flow. Diagnoses were taken from the medical registries at each site and found to be missing in 11% of cases. No epidemiologic data were available from the district medical records office on any of the diseases specific to the sick child algorithm for the under five age group.

5.0 CONCLUSIONS

The focus of this performance assessment has been on the *process* of assessing the patient's problem, not on the outcome of the visit. Our assumption is that "correct" process is much more likely to lead to a desired outcome. The sick child algorithm is based on that assumption. The summary paragraphs above, the figures, and the data matrix all demonstrate that the health workers were somewhat deficient in carrying out the process of assessing the problems of these 234 children, especially when compared to the performance standard defined by the sick child algorithm. Similar observational studies of child survival services done in the last five to ten years in numerous countries have documented the same weaknesses in compliance with program standards. The concern is how to correct these deficiencies.

There are many obstacles to treating sick children effectively in health facilities around the world. Among the most prominent are the absence of clearly defined standards that have been effectively communicated to health workers, infrequent or inadequate supervision, insufficient drug supplies, lack of awareness among caretakers in proper home care. Thus, the existence of an improved algorithm is not the only solution. Managers must take the entire service delivery system into consideration to understand how health worker and caretaker behavior is being influenced. Does the training adequately prepare the health worker to comply with a set of standards? Are supervisors competent to detect and correct errors in compliance? Is the record keeping system directly relevant to managers, supervisors and health workers in feeding back information about adherence to standards? Are caretakers being provided adequate counseling and are they able to follow the advice they are given?

It is important to note that these data describe shortcomings in worker performance, but they do not provide reasons for these problems. Thus, one should not conclude that their solution is obvious. Until managers, supervisors and the workers themselves have greater understanding of why these particular gaps exist, they do not know if the appropriate solution is more training, more effective job aids, to provide greater incentives, different/better supervision, or some combination. Two examples elucidate this point. In the case of workers not counting respiratory rate, health workers in Siaya District had not yet been trained in this technique, so training may be the appropriate response in this

case. On the other hand, the CDD algorithm calls for providers to ask about blood in the patient's stools and this was done in only 11 out of 64 cases. It is not at all clear that more training is the best response.

Effective supervision resides in having clearly defined expectations of workers. Workers who are unclear about what is expected of them will never be in a position to improve their own performance. Providing them with a clear set of practice guidelines and performance standards initially, and then promoting their use through training, supervision and job aids (posters, directives, detailed procedures, job descriptions, etc.) will go a long way toward improving worker performance and ultimately the quality of the services they provide.

Supervision and monitoring play an important role in assuring maximum quality of care. Supervisors in particular have an opportunity, in the course of routine supervision, to help workers to improve the quality of the care they provide. It requires, however, that supervisors take on a rather different role, becoming coaches and facilitators rather than simply monitoring compliance with standards. This approach becomes more team-like, and supervisors take on more responsibility for assuring that their supervisees have the skills to assess their own performance, identify obstacles to ideal performance, and develop solutions within the context of their work.

If used fully, monitoring remains an important tool in the continuous effort to improve the quality of care. Reporting accurately and in time can help District managers and supervisors to focus in on problem areas. facility-based information should also be accurate and readily available to clinic managers so that they can use the data they collect and compile to improve the quality and utilization of services as soon as problems or opportunities arise.

Counseling mothers remains one of the weakest links in the primary health care system. This proved to be the case in Siaya as well. Caretakers are critical to the outcome of a child's illness episode. Case management of the sick child necessarily includes correct administration of treatment once the child returns home and assurance that the caretaker knows what to do in the case the child's condition worsens. Providers and dispensers need to improve the type of advice they offer and ensure that caretakers understand how to carry out this advice. Appropriate home-based care increases the child's chances of improving and reduces the burden on the health facility and staff.

Appendix A

Data Collection Instruments

SICK CHILD OBSERVATION CHECKLIST

Observer: _____

Facility: _____ Date: ____________

☐ ECN ☐ CO ☐ Other _____

Patient name: _____ Age: _____

Sub-location: _____ Patient no. _____

(NOTE DURATION OF ENCOUNTER)

Time: Start: _____

Reason for coming: (Complaint according to Mother/caretacker)

Chief:	Sub-Chief:
☐ Cough	☐ Cough
☐ Diarrhoea	☐ Diarrhoea
☐ Fever	☐ Fever
☐ Ear problems	☐ Ear problems
☐ Rashes	☐ Rashes
☐ Other _____	☐ Other _____

Diagnosis in registry: _____

I. Assessing the sick child

Did the HW check for danger signs?		Y	N	DK
1. ask mother if child is able to drink	1.	☐	☐	
2. ask mother if child has had convulsions	2.	☐	☐	
3. check to see if child is abnormally sleepy or difficult to wake	3.	☐	☐	☐
(If no for above, skip to no. 6)				
4. (If Child has danger sign) did HW refer child urgently to hospital?	4.	☐	☐	
5. If child referred urgently, did HW prescribe, administer or distribute any medication?	5.	☐	☐	

If yes, which? _____

Sick Child Observation Checklist-page 2 Patient no._____

II. Classifying and Treating the Sick Child			
Did the HW ask if the child has the following symptoms:		Y	N
6. Cough (GO TO 10-15)	6.	☐	☐
7. Diarrhoea (GO TO 16-22)	7.	☐	☐
8. Fever (GO TO 23-34)	8.	☐	☐
9. Ear problem (GO TO 35-40)	9.	☐	☐

If COUGH, did HW:		Y	N	DK
10. raise or remove child's shirt?	10.	☐	☐	
11. count respiratory rate?	11.	☐	☐	
12. look for chest indrawing?	12.	☐	☐	☐
13. look/listen for stridor?	13.	☐	☐	☐
14. listen with stethoscope?	14.	☐	☐	

If DIARRHOEA, did HW:		Y	N
15. ask about blood in the stool	15.	☐	☐
16. ask about duration of diarrhoea	16.	☐	☐
17. examine: eyes (for dry or sunken)	17.	☐	☐
18. mouth/tongue (for dryness)	18.	☐	☐
19. offer child a drink	19.	☐	☐
20. pinch the skin	20.	☐	☐

 Patient no._____

II. Classifying and Treating the Sick Child - Continued

If FEVER, did HW:		Y	N	DK
21. ask duration of fever	21.	☐	☐	
22. ask if fever is intermittent	22.	☐	☐	
23. ask if child has had chills, sweats or shaking	23.	☐	☐	
24. ask if child is vomiting	24.	☐	☐	
25. ask duration of vomiting	25.	☐	☐	
26. feel the child for fever	26.	☐	☐	
27. measure temperature with a thermometer	27.	☐	☐	
28. flex child's neck	28.	☐	☐	
29. examine child for rash	29.	☐	☐	☐
30. examine : eyes (red, pus, white spots, or clouding)	30.	☐	☐	
31. mouth (ulcers)	31.	☐	☐	

If EAR PROBLEM, does HW:		Y	N	DK
32. ask if child has ear pain	32.	☐	☐	
33. ask if child has ear discharge	33.	☐	☐	
34. ask duration of discharge	34.	☐	☐	
35. examine inside ears (w/ otoscopy)	35.	☐	☐	
36. behind ears	36.	☐	☐	

Did HW check the child's nutritional status?		Y	N	DK
37. was child weighed?	37.	☐	☐	☐
38. was weight recorded?	38.	☐	☐	☐
39. did HW check child's card for weight for age?	39.	☐	☐	☐
40. check eyelid pallor	40.	☐	☐	☐
41. look for foamy patches in eyes	41.	☐	☐	☐
42. look for severe wasting	42.	☐	☐	☐
43. look for oedema	43.	☐	☐	

		Y	N	DK
44. was lab work requested?	44.	☐	☐	☐
If yes, which?				
45. glucose	45.	☐	☐	☐
46. blood smear	46.	☐	☐	☐
47. hemoglobin	47.	☐	☐	☐
48. stool	48.	☐	☐	☐

III. Counseling the caretaker		Y	N
49. did HW tell mother to return?	49.	☐	☐
50. did HW tell mother to return immediately if danger signs present. (can't drink, getting worse, no better in 3 days)	50.	☐	☐
51. did HW tell mother to return if other signs appear? (difficulty breathing, bloody or frequent diarrhoea, vomiting, fever)	51.	☐	☐
52. did HW tell mother how to administer supportive treatment?	52.	☐	☐
53. breastfeeding	53.	☐	☐
54. foods	54.	☐	☐
55. fluids	55.	☐	☐
56. ear wicking	56.	☐	☐
57. other? _____	57.	☐	☐
58. did HW explain or demonstrate how to administer drug or therapy?	58.	☐	☐
59. did HW verify if mother understood instructions?	59.	☐	☐

IV. Preventive actions		Y	N	DK
60. Did HW check child's health card for immunization?	60.	☐	☐	☐
61. Did HW refer child for vaccination?	61.	☐	☐	☐

ending time:_____

(AFTER HW HAS COMPLETELY FINISHED WITH THIS PATIENT, ASK THE FOLLOWING:)

What was your diagnosis of this child? (CHECK ALL THAT APPLY)

62. ☐ pneumonia/bronchitis
63. ☐ cough/cold
64. ☐ diarrhoea
65. ☐ dehydration
66. ☐ fever/malaria
67. ☐ other_____
68. How did you arrive at this diagnosis?_____

_____

_____

69. Did you refer child? 69. ☐ ☐
If yes, where? (CHECK APPROPRIATE BOX)

		Why?			
70. ☐ within facility		74. very severe disease	74.	☐	☐
71. ☐ health center		75. needed lab work	75.	☐	☐
72. ☐ hospital		76. needed drugs	76.	☐	☐
73. ☐ other _____		77. other_____			

Sick Child Caretaker Exit interview

Facility:_____ Date_____ Interviewer:_____

Patient Number _____ Patient Name_____

Observation of dispenser:

did dispenser tell mother how to administer any supportive treatment:

1. breastfeeding?
2. foods?
3. fluids?
4. ear wicking?
5. other?_____

	Y	N	DK
6. did dispenser explain or demonstrate how to give drug or therapy?			
7. did dispenser verify if mother understood instructions?			

(insert intro)

8. Why did you bring your child today? (complaint)_____

What diagnosis did the health worker give your child?

9. Malaria
10. Diarrhoea
11. Dehydration
12. Cough/cold
13. Pneumonia/bronchitis
14. Other_____
Not Told

	Y	N	DK
15. Did the health worker prescribe a treatment for your child?			

What treatment did he/she prescribe? (note what card states)

LABEL

16. Chloroquine
17. Paracetomol
18. Procaine penicillin
19. Triple pen. powder
20. benzyl penicillin

LABEL

21. Co-trimoxazole
22. Septrin
23. Tetracycline eye ointment
24. ORS
25. Other_____

	Y	N	DK
26. Did you get everything that was prescribed at the pharmacy?			

If you did not get all the medications you need, where will you get them?

27. chemist
28. another health center/hospital
29. other_____

	Y	N	DK
30. Did the health worker or pharmacist explain how to administer treatment? (how to take pills and how often, how to mix ORS)			

31. Could you tell me what he said? _____

If your child does not improve, what will you do?

32. come back to the facility
33. go to another health center/hospital
34. go to a traditional healer
35. buy more medicine
36. don't know
37. other_____

How long should you wait?

38. less than 2 days
39. 2 days
40. more than 2 days
41. when the dosage is finished.
42. doesn't know

Sick Child Logistics Survey

Facility: _____ Date _____ Observer: _____

What stocks are on hand? (record stock on hand day of the visit)

	good	expired
Injectible penicillin:		
procaine penicillin	____ ml	____ ml
triple penicillin powder	____	____
benzyl penicillin/Crysta	____	____
Oral penicillin:		
VK tablets	____	____
syrup	____	____
Ampicillin:		
Amoxycillin	____ ml	____ ml
Co-trimoxazole:		
bactrim/Septrin	____	____
trimethroprim/ sulfamethoxazole	____	____

	good	expired
Chloroquine:		
tablets	____	
injection	____ ml	____ ml
syrup	____ ml	____ m
Tetracycline:		
capsules	____	____
ointment	____	____
Pyrimethamine/sulpha:		
fansidar tablets	____	____
metakelphin	____	____
"local brand"	____	____
Gentian Violet	____	____
ORS	____	____

What is the longest period the RHF has been out of medecine in the last 12 months?

	<1w	1w-1m	1m-3m	>3m
Injectible penicillin	☐	☐	☐	☐
Ampicillin (inject)	☐	☐	☐	☐
Ampicillin (oral)	☐	☐	☐	☐
Amoxycillin	☐	☐	☐	☐
Co-trimoxazole (septrin)	☐	☐	☐	☐
Chloroquine	☐	☐	☐	☐
Tetracycline eye ointment	☐	☐	☐	☐
Gentian Violet	☐	☐	☐	☐
ORS	☐	☐	☐	☐

Are expired drugs sometimes used? ☐Y ☐N Which drugs? _____

Are the following available and functioning the day of the visit?

	Y	N
Stethoscope?	☐	☐
Otoscope?	☐	☐
Scale?	☐	☐
Microscope?	☐	☐
Sterilizer	☐	☐
Cold storage (for vaccines)	☐	☐

	Y	N
needles	☐	☐
syringes	☐	☐
vaccines	☐	☐
health cards	☐	☐

Have there been stockouts in the last 12 months Y ☐ N ☐

	Y	N
water	☐	☐
electricity	☐	☐

(source: _____)

What laboratory tests are available in the RHF the day of the visit?

	Y	N
urine analysis (via dipstick)	☐	☐
blood smear	☐	☐
hemoglobin	☐	☐
stool O/P	☐	☐
AFB stain	☐	☐
Widal test	☐	☐

Other

What laboratory supplies are available the day of the visit?

	Y	N
slides	☐	☐
alcohol (spirits)	☐	☐
lancets	☐	☐
stain	☐	☐

Other _____

Appendix B

Persons contacted

CDC/Atlanta
Dr. Carlos C. Campbell, Chief, Malaria Branch
Dr. Bernard Nahlen, Director, Malaria Branch Field Station Kenya
Dr. Jane Zucker, SCC Principal Investigator, Deputy Chief, Malaria Surveillance and Prevention Activity
Dr. Brad Perkins, SCC Principal Investigator, Meningitis and Special Pathogens Branch
Dr. Lynn Paxton, EIS Officer

KEMRI
Dr. Aggrey Oloo, Director
Dr. Juliana Otieno, SCC Study Pediatrician
Mr. Charles Obonyo, SCC Study Clinical Officer
Mr. Tobias Okech, Field Technician
Mr. Festus Okute, Field Technician
Mr. Elisha Odoch, Data Entry Specialist

WHO/CDR Nairobi
Edward Saunders, ARI

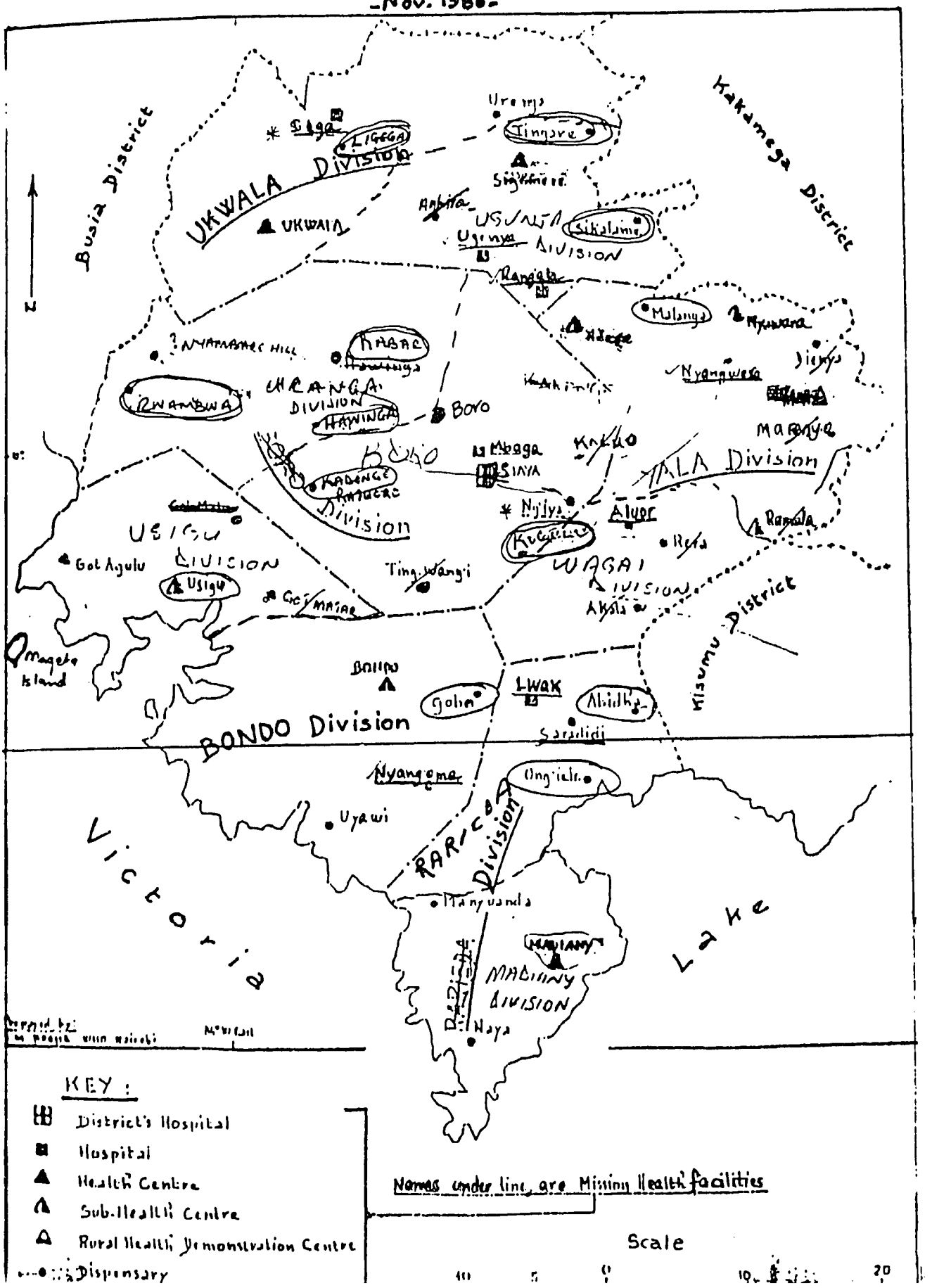
Ministry of Health/Siaya District Health Office
Dr. O'nudi Olang'o, Medical Officer of Health
Dr. Ben Ogonji, Pharmacist In Charge
Mr. John Odera, District Public Health Officer
Mr. Audi Owino, Clinical Officer in Charge
Mr. Francis Ochuka, Pharmaceutical Technologist
Mr. James Okoth, Medical Records
Mrs. Dorcas Ogone, District Nursing Officer In Charge
Mrs. E. Opole, District Public Health Nurse

Siaya District Hospital
Mr. Thomas Onyango, Pediatric Clinical Officer, SDH/OPD

REACH/Measles Initiative
Dr. Munyiri, Technical Officer
Dr. Shiroya, Pediatrician, Nyanza Provincial Hospital (consultant)

Appendix C

NYANZA PROVINCE
SIAYA DISTRICT
HEALTH FACILITIES (Government-Mission)
-Nov. 1986-



KEY :

- District's Hospital
- Hospital
- Health Centre
- Sub-Health Centre
- Rural Health Demonstration Centre
- Dispensary

Names under line are Missing Health facilities

Scale

40 5 0 10 20