Correct Case Management of Childhood Diarrhea: A Survey of Nine State Capitals in Northeast Brazil[1]

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The National Program for Maternal and Child Health (COSMI) of the Ministry of Health (MOH) of Brazil conducted a survey in nine state capitals from 29 March to 30 April 1993 to assess how well health facilities were managing diarrhea cases in patients under 5 years of age. One of seven PAHO/WHO health facility surveys performed in Latin America and the Caribbean in 1992–1993, the Brazilian survey took place in the Northeast Region where most diarrheal morbidity and mortality occur. Like the other six surveys, it used a new PAHO/WHO methodology designed to collect data on certain principal indicators through observation, interviews, and review of clinical records.

Overall, 475 cases of patients with diarrhea were observed in 192 facilities, and 463 health workers and 474 caretakers were interviewed. The results indicated that few diarrhea patients received care that strictly followed the PAHO/WHO/Ministry of Health treatment guidelines. In terms of these guidelines, the correct procedure was used to assess the patient's hydration status only 8% of the time, and only 1% of the health workers provided correct advice to the caretaker on prevention and home care aspects of diarrheal diseases. The procedure used to rehydrate patients with oral rehydration salts (ORS) was correct in only 6% of the cases. Of those patients with bloody stools, 24% were treated appropriately with antibiotics. Besides collecting information on correct case management, the survey provided a basis for developing two-year operational plans of action in each of the nine participating states to strengthen efforts directed at controlling and preventing diarrheal diseases, including cholera.

Diarrheal diseases produce high morbidity and mortality in Brazil and constitute an important public health problem (*1*). This is especially evident in the Northeast Region, where diarrhea is the primary cause of death in children less than 1 year of age and contributes significantly to the high rates of malnutrition observed in this age group (*2*). In 1986, a survey of a poor population in northern Brazil recorded 4.8 diarrheal episodes per year for children from birth to

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35 months of age and 0.2 episodes per year for adults (3). Before that, in 1983, a survey of a poor urban group in Northeast Brazil found similar rates for young children but substantially higher ones (more than one episode per year) for adults (4).

Regarding official efforts against the problem, in 1982 Brazil's Ministry of Health (MOH) launched a specific action plan aimed at reducing childhood morbidity and mortality by countering diarrheal diseases. This plan was implemented under the National Program for Maternal and Child Health (COSMI). Since the plan's inception, principal emphasis has been placed on training selected national and state health workers in diarrheal disease case management and supervisory skills and establishing Diarrheal Training Units (DTU).

Later, in 1989, diarrheal disease control efforts were intensified in the Northeast Region. New activities included a household case management survey performed in four states using PAHO/WHO methodology (5). This survey identified critical high-risk areas for diarrhea case management. In response, action plans were redirected, health education messages based on a comprehensive communication strategy were developed, and additional training was conducted.

In 1993, under the direction of COSMI, the review process was continued by means of a health facility survey conducted in nine northeast states from 29 March to 30 April. This was one of seven PAHO/WHO health facility surveys carried out in different countries of Latin America and the Caribbean in 1992–1993. The information obtained from the Brazilian survey served as a basis for developing two-year operational action plans in each of the nine states for strengthening control of diarrheal diseases, including cholera. This article reports the findings of that survey.

OBJECTIVES

The survey had four principal aims. The first of these was to assess the quality of diarrheal case management at health facilities among patients less than 5 years of age by evaluating the following specific matters: (a) assessment of diarrhea cases; (b) rehydration of dehydrated cases; (c) the quality of advice given to caretakers regarding use of ORS, home care, and diarrhea prevention; and (d) use of antibiotics and other drugs. Another survey aim was to determine the level of knowledge of health workers and caretakers regarding prevention and treatment of diarrheal diseases (including cholera) and breast-feeding practices. The survey also sought to assess the quality of support (including review of clinical records) that was provided at the health facilities for correct case management of diarrhea cases. In addition, it sought to identify problems and propose action-oriented solutions to improve health facility promotion of breast-feeding and of management of cholera and other diarrheal disease cases.

METHODS

The survey followed a new methodology described in the WHO/PAHO *Health Facility Survey Manual, Diarrhea Case Management* (6). On the basis of data affirming that over 50% of all diarrheal deaths in Brazilian children under 5 years old and over 80% of all cholera cases were occurring in the Northeast Region, capital cities in nine northeast states (Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe) were selected for inclusion in the survey (7).

To select the actual study sample, a cluster technique was used wherein outpatients less than 5 years of age with

diarrhea attending a single health facility were defined as a cluster. In selecting the sample, the following practical considerations were used: (1) Because of fiscal and time limitations, the survey was limited to urban areas of state capitals in each of the nine states and to three types of health facilities (hospitals, health centers, and health posts); (2) The method used to select health facilities was a simple random sampling technique. A list of health facilities meeting the prior condition and selected in this manner was compiled, and the average number of children less than 5 years of age with diarrhea who were seen at each facility was then tallied. Because only 25% of the facilities had available records to identify patient caseloads, each facility was asked to estimate its caseload during the month occurring 1 year before the planned health survey. Health facilities reporting approximately the same caseload size were included in the sample. To help ensure that a minimum of 3 diarrhea cases would be observed at each facility, a minimum sample size of 20 clusters was established for each state, achieving limits of precision of ± 15.

In all, 192 health facilities were visited and evaluated with regard to the adequacy of their supplies, space, record-keeping, and other matters. The management of 475 diarrhea cases was observed; and 474 caretakers together with 463 health workers—including 399 physicians, 38 nurses, and 28 others (nursing auxiliaries, assistant nurses, etc.)—were interviewed.

Data Collection

The survey questionnaires were adapted to national treatment guidelines, based on PAHO/WHO treatment norms. Questions on cholera, breast-feeding, persistent diarrhea, and food management were added. In all, each surveyor used the following five questionnaires:

(a) Observation of case management: This questionnaire was designed to record observations about how a health worker assessed and treated a diarrhea case.

(b) Interview with caretaker: This questionnaire recorded results of the interview with the patient's caretaker—including answers to queries about the caretaker's knowledge of ORS, home care, and prevention of diarrhea—and review of the patient's degree of dehydration and nutritional status to serve as an independent assessment and decision about the treatment needed.

(c) Interview with health worker: This form was designed to help determine and record the health worker's level of knowledge regarding assessment, treatment, and home treatment advice provided for patients with diarrhea, including cholera.

(d) Assessment of health facilities and supplies: This form recorded the results of health facility inspection, of an interview with the facility administrator performed to assess the facility's adequacy and supplies availability, and of interviews with health workers directed at assessing other factors capable of affecting case management quality; and

(e) Review of clinical records: The results of reviewing 20 records in each facility's register were set down on this form. The purpose of the review was to assess the facility's record-keeping quality and pattern of diarrhea case management practices, including use of ORS and drug therapy.

Training and Field Activities

The survey was conducted simultaneously in the nine capital cities studied. Thirty-nine surveyors (38 physicians and

1 nurse) received 50 hours of training in the survey's methodology. This training included review of the five standardized survey questionnaires and technical treatment guidelines, visits to the health facilities to practice assessing diarrhea cases, and observation and interviews of health workers and caretakers. During the fieldwork, daily meetings were held with the state coordinators to clarify any problems and review the survey questionnaires for inconsistencies in recording data.

Data Management and Analysis

Upon completion of the fieldwork, the survey questionnaires were reviewed again for inconsistencies. Their data were then entered into eight standardized PAHO/WHO tally sheets, plus two additional tally sheets especially developed for the Brazil survey that included questions on cholera, breast-feeding, persistent diarrhea, and food management. Some of the data was cross-referenced using an EPI-INFO5 software package. Results related to key program indicators and other important data were compared by city and state.

The strategy used to analyze results was developed to answer the following questions: (1) What is the quality of diarrhea case management in health facilities? (2) Were the cases of acute diarrhea assessed correctly? (3) Were the acute diarrhea cases rehydrated correctly? (4) What quality of home care and diarrhea prevention advice was provided to caretakers? (5) What is the use pattern of antibiotics and other medications in diarrhea treatment? (6) Do health facilities have the supplies and resources (8) needed for correct case management? and (7) What is the health professional's level of knowledge about persistent diarrhea and nutritional support, including breast-feeding?

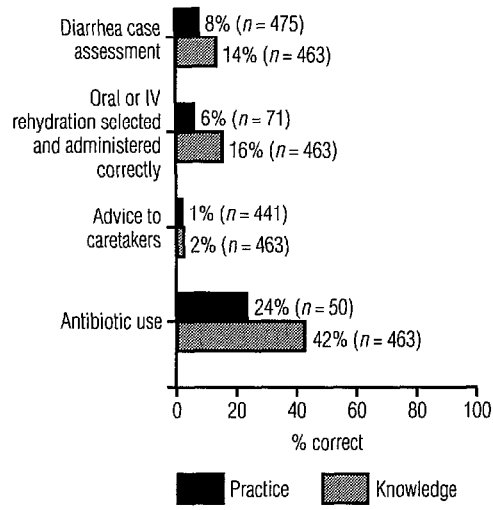
RESULTS

What Is the Quality of Diarrhea Case Management in Health Facilities?

The data were tabulated and analyzed to determine the quality of case management based on four principal PAHO/WHO health facility indicators: (1) correct diarrhea case assessment, (2) correct rehydration of dehydrated cases (with ORS or intravenous fluids), (3) provision of correct advice to caretakers about home treatment of diarrhea, and (4) correct administration of antibiotics to dysentery cases.

Figure 1 shows the results of surveying these case management indicators through (a) observation of case management (practice) and (b) interviews held with the health workers (knowledge). Although the results were uniformly poor in terms of these criteria, collective health

Figure 1. Percentages of diarrhea cases receiving correct management with respect to case assessment, rehydration of cases with some dehydration or severe dehydration, advice provided to caretakers, and antibiotic use (key practice and knowledge indicators).



worker knowledge was greater for each indicator than the collective quality of practice.

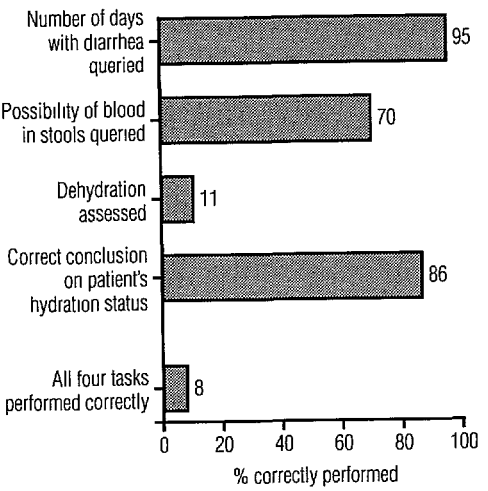
Thirty-eight (8%) of the 475 diarrhea cases were correctly assessed (by taking an adequate history of the episode, performing a physical examination, and reaching a correct conclusion regarding the degree of dehydration). Four (6%) of the 71 observed cases with some dehydration or severe dehydration were correctly rehydrated. Only 4 (less than 1%) of the caretakers who accompanied the patients to the health facility received the correct advice (see above) about diarrhea treatment and prevention. In addition, 50 cases of dysentery (11% of the total diarrhea cases observed) were identified. Of these, 12 (24%) received the antibiotic recommended by national guidelines, and 21 (42%) of the caretakers involved received correct instructions regarding antibiotic use.

Were the Cases of Acute Diarrhea Assessed Correctly?

Four composite tasks were observed to measure the quality of diarrhea patient assessment. Specifically, it was noted whether the health worker (1) asked the caretaker about the number of days the child had experienced diarrhea, (2) asked the caretaker if there was blood in the stool, (3) adequately assessed the patient's degree of dehydration by looking for 5 out of 7 possible signs and symptoms, and (4) made the correct decision about the degree of dehydration (agreeing with the surveyor's conclusion). For purposes of the survey, the health worker was deemed to have assessed the case correctly only if all four of these assessment tasks were adequately performed.

Figure 2 shows the proportion of case assessment tasks performed correctly for the 475 study subjects with diarrhea. Most of the health workers asked about diarrhea duration (95%) and blood in the stools

Figure 2. Percentages of case assessment tasks performed correctly for the 475 study subjects with diarrhea.



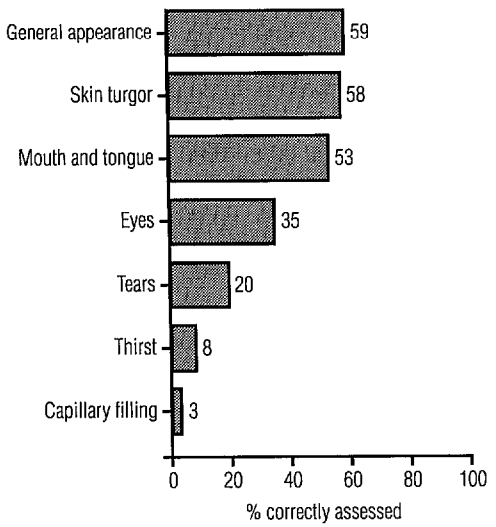
(70%). Most (86%) also arrived at the correct conclusion regarding the patient's hydration status. However, patients were only examined for five out of the seven specific signs and symptoms of dehydration in 11% of the cases. Therefore, when the PAHO/WHO criteria are strictly applied (requiring correct completion of all four basic tasks), only 8% of the diarrhea cases were correctly assessed.

Further analysis was done to assess the performance of each of the four basic tasks. Regarding assessment of dehydration signs and symptoms, Figure 3 shows the percentages of cases in which each of the seven aforementioned signs and symptoms was assessed. As may be seen, several of the seven were examined in over half the cases. However, capillary filling, a key sign in the national program (*9*), was examined in only 3% of the cases.

Were Dehydrated Cases of Acute Diarrhea Rehydrated Correctly?

The composite indicator of the WHO Program for Control of Diarrheal Diseases (CDD) relating to correct rehydra-

Figure 3. Percentages of the 475 diarrhea cases in which each of the seven indicated signs and symptoms of dehydration were assessed.



tion requires that the health worker (1) select the appropriate treatment for the patient's degree of dehydration, (2) order the correct volume of liquid, and (3) administer it correctly to patients with some dehydration (Plan B) or severe dehydration (Plan C). Plan A, B, and C patients are classified as having a fluid deficit of <5%, 5–10%, and >10% of their body weight, respectively. Plan A patients with acute watery diarrhea can be managed at home. Plan B patients usually do not need hospital admission and can be treated with ORS packets. Plan C patients can die quickly from hypovolemic shock; they should be treated immediately with intravenous fluids and should then be reassessed (*10*).

Table 1 shows the conclusions reached by health workers about patient dehydration status and findings as to whether those conclusions were correct. Seventy-five (16%) of the patients with dehydration were classified by the surveyor as having some dehydration, while 6 (1%) were classified as having severe dehydration. In contrast to the low correct assessment rate (8%), the health worker's conclusion about the degree of dehydration was correct in 408 (86%) of the cases.

Earlier studies have found that the more dehydrated a child is, the more likely a health worker is to make an incorrect assessment (*11*). Our findings support this view, the rate of incorrect assessment of dehydration generally being 14%, with the rate of incorrect assessment of moderate and severe dehydration cases being 31% and 33%, respectively. Statistically, the difference between incorrect assessment of dehydration and incorrect assessment of some dehydration or severe dehydration appears highly significant ($P < 0.001$).

Table 2 shows that while 344 (72%) of the dehydrated patients were correctly rehydrated (most with ORS) and 4 (67%) of those severely dehydrated were correctly rehydrated with intravenous (IV) fluids, only 12 (16%) of those with some dehydration (as evaluated by the surveyors) received correct treatment. Specifically, many incorrectly treated patients with some dehydration (70%) were sent home

Table 1. The validity of health worker conclusions about patient dehydration status, according to surveyor observations.

	Health worker conclusions					
	Correct		Incorrect		Total	
Dehydration status	No. (n = 408)	(%)	No. (n = 67)	(%)	No. (n = 475)	(%)
Plan A	352	(89)	42	(11)	394	(83)
Plan B (some)	52	(69)	23	(31)	75	(16)
Plan C (severe)	4	(67)	2	(33)	6	(1)

Table 2. The correctness of rehydration treatment plans selected for diarrhea patients, according to surveyor observations.

	Validity of treatment plan selected					
	Correct		Incorrect		Total	
Dehydration status	No. (n = 344)	(%)	No. (n = 131)	(%)	No. (n = 475)	(%)
Plan A	328	(83)	66	(17)	394	(83)
Plan B (some)	12	(16)	63	(84)	75	(16)
Plan C (severe)	4	(67)	2	(33)	6	(1)

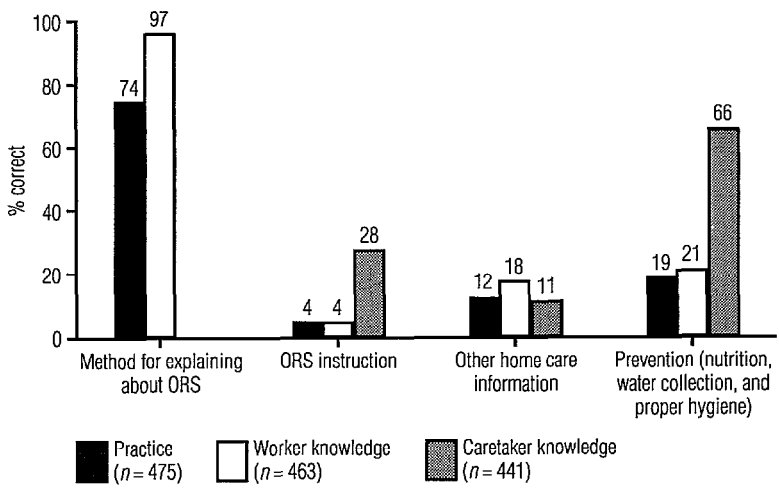
without remaining a sufficient time at the health facility for ongoing assessment and treatment, while another 30% were referred for unnecessary IV therapy.

What Quality of Home Care and Diarrhea Prevention Advice Was Given to Caretakers?

For survey purposes, the caretaker was considered correctly advised when the health worker performed the four following communication tasks: (1) gave correct instruction on ORS preparation and administration (2) using an appropriate method of instruction; (3) gave correct advice on home care (increased fluids, continued feeding); and (4) correctly described four diarrhea prevention measures (breast-feeding, use of clean water sources, proper hygienic practices, and measles immunization).

As Figure 1 shows, according to these standards, the health workers provided fully correct advice to only 4 of 441 caretakers. (Thirty-three caretakers were excluded from the total number for reasons of referral or admission for other treatment.) It is true, as indicated in Figure 4, that the health workers used an appropriate method (demonstration or oral presentation) to explain about ORS or salt and sugar solution (SSS) preparation and administration to 342 (74%) of the caretakers. However, only 19 (4%) of the caretakers were actually provided with

Figure 4. Quality of practice compared to health worker and caretaker knowledge with regard to ORS preparation and administration, other home care for diarrhea cases, and appropriate preventive measures.



correct advice on how to prepare and administer ORS, while only 57 (12%) were provided with information on other appropriate home care (increased fluids, continued feeding). This could help to explain why only 123 (28%) of the caretakers interviewed responded correctly regarding preparation of ORS and other home fluids, and why only 47 (11%) had adequate home care knowledge. (It should be noted that the data collected showed great variation when analyzed by state.)

Information about cholera had been received by 384 (81%) of the 475 caretakers, this information having been obtained via television, health services, health agents, schools, etc. Nevertheless, 455 (96%) of the caretakers interviewed did not know that cholera is a diarrheal disease associated with serious dehydration, and 427 (90%) did not know that death due to cholera can occur in less than 12 hours.

What Is the Use Pattern of Antibiotics and Other Medications in Diarrhea Treatment?

Of the 475 diarrhea cases observed, 50 (11%) involved bloody stools. The cases were not evenly distributed among the nine states, relatively high numbers being found in the states of Alagoas (13 cases), Maranhão (10), Paraíba (9), and Rio Grande do Norte (8). Only 12 of the 50 cases (24%) were treated correctly with oral antimicrobial agents. It should also be noted that correct treatment was observed in only four states, 3 cases (100%) being correctly treated in Bahia, 6 (46%) in Alagoas, 2 (40%) in Sergipe, and 1 (10%) in Maranhão.

Despite the uneven distribution of dysentery cases among the states, 195 health workers (42%) were aware of the recommended treatment for dysentery. Also, little inappropriate antibiotic use was seen, 413 (87%) of the patients receiving no antibiotics when they had no dysentery. In addition, 314 (66%) of the patients received no other medication during their diarrhea episodes. These very positive findings reflect a growing tendency within the medical community to avoid prescribing drugs for acute diarrhea. The medications ordered most frequently for those 161 patients (34%) who received drugs for diarrhea-associated symptoms were antimotility drugs (for 28%), antiparasitics (for 20%), antiemetics (for 16%), and antidiarrheals (for 2%).

Do Health Facilities Have the Supplies and Resources Needed for Correct Case Management?

Of the 192 health facilities surveyed, 124 (65%) had no specific area for performing oral rehydration therapy (ORT), and 119 (62%) lacked the physical space or furnishings needed to establish an ORT area. Of the facilities, 111 (58%) were found to lack ORS packets, while 121 (63%) lacked basic equipment for preparing and administering ORS such as calibrated 1-liter containers, cups, and spoons. Fifty-seven (30%) of the facilities had no diarrhea treatment standards, and another 77 (40%) had standards that were inadequate by Health Ministry/PAHO guidelines. Ninety-eight (51%) of the facilities reported shortages of IV fluids, and 146 (76%) had insufficient supplies of antibiotics for dealing with dysentery and cholera—a significant obstacle to adequate treatment of those ailments.

Ninety-six (50%) of the facilities conducted health education sessions on home care and diarrhea prevention. However, only 27 (14%) had health posters on diarrhea or other prevention messages placed at visible locations, and only 6 (3%) had educational materials (illustrated pamphlets) available for distribution to those caring for diarrhea patients.

With regard to record-keeping, which exerts a strong influence on the quality of supervision, 144 (75%) of the facilities visited did not record data needed to plan

their supply needs (data such as total population of the area served and the number of children less than 5 years old in that area); nor did they meet all of the recording standards cited with respect to entering the degree of dehydration and treatment received in the patient's clinical record.

What Is the Health Professional's Level of Knowledge about Persistent Diarrhea and Nutritional Support, Including Breast-feeding?

Most of the 463 health workers interviewed understood the importance of breast-feeding. Three hundred and eighty-nine (84%) knew of the exclusive breast-feeding concept (breast-feeding unsupplemented by any other food or liquid), and 380 (82%) stated that exclusive breast-feeding should be continued for the first four to six months. In this same vein, 434 (94%) said that colostrum had important nutritional and immunologic properties and that breast-feeding should start immediately after delivery. Nevertheless, only nine workers (2.3%) stated that they felt this information to be important when advising a caretaker about diarrhea prevention.

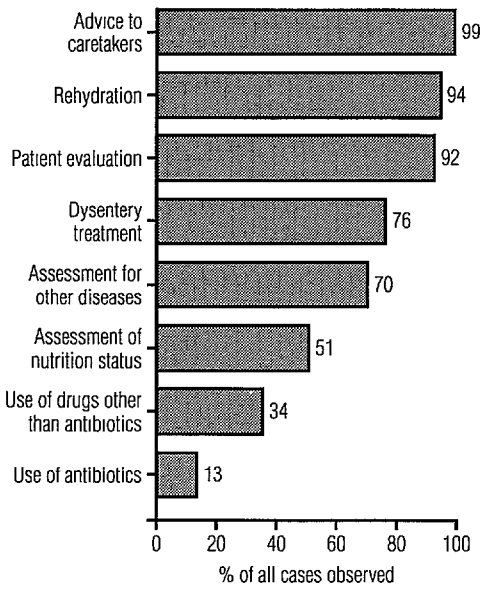
While 407 (88%) of the health workers interviewed stated that patients with persistent diarrhea deserved special care and treatment, only 37 (8%) were able to identify risk factors associated with development of persistent diarrhea. Also, while the patient's nutritional status was assessed in 51% of the cases, the surveyors found that 67% of the nutritional assessments were not performed correctly. Among other things, the patient's weight was not checked or was taken incorrectly in 26% of the cases, even though scales in good condition were present at 84% of the facilities.

DISCUSSION

The results obtained indicate that few patients with diarrhea were managed correctly according to the strict PAHO/WHO/Ministry of Health treatment guidelines used in this survey.[4] Although 223 (48%) of the health workers observed had received some type of training in diarrheal disease control, only 27 (6%) had participated in a MOH/PAHO case management training course providing 8 hours of practical experience. This suggests that the training and follow-up supervision and monitoring received may have been inadequate—as reflected in the poor overall performance of assessment and treatment skills.

Figure 5 summarizes specific areas where the observed diarrhea case management performed by health workers was

Figure 5. Percentages of the 475 diarrhea cases that were not managed in consonance with national norms and policies with respect to each of seven areas of action.



[4]Although these results are not directly comparable to those obtained in other countries, the median results obtained by the six 1992–1993 PAHO/WHO health facility surveys in other countries also indicated low performance scores by health workers in terms of the PAHO/WHO criteria.

not consistent with national norms and policies. Particular problems identified and suggested measures for improving diarrheal disease case management in Brazil are shown in Table 3.

A number of factors seem likely to have contributed to the deficient case management observed. Among them: (1) Diarrheal disease treatment charts and manuals were lacking at 124 (65%) of the 192 health facilities studied. (As the PAHO/WHO guidelines stress, without a practical treatment chart it is difficult to select and calculate fluid volumes in a standardized manner.) (2) Required fluid volumes were rarely calculated by the health worker or were calculated incorrectly. (3) Workers did not keep patients with some dehydration at the health facility for the full 4–6 hour rehydration phase. (4) Many facilities lacked equipment for mixing and administering ORS in standard quantities and providing adequate IV setups. (5) At over half (58%) of the facilities, ORS supplies were in short supply during the month preceding the survey. (Fluid and equipment shortages place a significant constraint on appropriate rehydration therapy.) And (6) in 99% of the cases, advice on home care and prevention of diarrhea was not adequately provided to caretakers, either for lack of health worker knowledge or because of health care system inefficiencies such as insufficient staffing, excessive patient load, and inadequate supervision. All of these factors seem very likely to have influenced how well the health workers assessed and treated patients.

RECOMMENDATIONS

Program Management

(a) Designate an ORT area at each health facility. This area should be equipped with basic treatment supplies and should be continually restocked as required.

(b) Distribute the diarrhea treatment chart widely in order to facilitate a comprehensive dehydration assessment and treatment process.

(c) Ensure that training courses provided by various government and donor agencies are coordinated and are consistent with national treatment guidelines and training methods.

(d) Provide education at all levels regarding the importance of filling out clinical records properly and the need to have

Table 3. Summary of problems identified and recommendations made to improve diarrheal disease case management in Brazil.

Problems identified	Recommendations
Cases observed:	
99% of caretakers were not advised correctly	1) Review training plans
94% of the moderately to severely dehydrated cases were rehydrated incorrectly	2) Promote case management training in health worker school curricula
92% were assessed incorrectly	3) Establish diarrhea training units
76% of dysentery patients did not receive the correct antibiotics	4) Emphasize communication skills with caretakers
70% were not assessed for other diseases	
51% were not assessed nutritionally	
Health facilities visited:	
65% had no ORT area	1) Establish ORT corners
58% lacked ORS packets	2) Strengthen supervision and monitoring
51% had a shortage of intravenous fluids	3) Prepare "check-lists" for monitoring supplies
76% had insufficient supplies of antibiotics	4) Distribute treatment charts and norms
65% had no diarrheal diseases treatment chart	
30% had no diarrhea treatment norms	

diarrhea registers and forms that include more specific information about each case's assessment and treatment, so as to permit improved surveillance and monitoring of the diarrheal disease problem.

(e) Develop state plans of action based on survey results; such plans should be fully funded, implemented, and monitored.

Treatment

(a) Establish new Diarrhea Training Units (DTU) and improve supervision of existing ones.

(b) Begin training all in-service health workers in the PAHO/WHO methodology, providing them with a minimum of 8 hours of practical experience.

(c) Promote inclusion of correct case management training in all health workers' basic school curricula.

(d) Emphasize health worker training skills in proper communication and health education techniques.

Service and Supervision

(a) Strengthen health facility supervision by establishing a checklist for use during supervisory visits and by programming adequate resources at the state level to ensure these visits are made regularly.

Facilities and Supplies

(a) Ensure continuous availability of the antibiotics recommended for treating dysentery cases in health facilities and of adequate supplies for properly preparing and administering ORS.

CONCLUDING COMMENT

The survey reported here served not only to collect data on case management indicators but also to stimulate program development and redirect strategic action-oriented efforts. The survey results helped national authorities to reassess program strategies and make adjustments in program implementation. The recommendations contained in this article are designed to help national health authorities strengthen the management of diarrheal disease cases at the health facility level in Brazil.

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Fred L. Soper Award for 1996

This is a call for submission of nominations for the 1996 award in honor of Fred L. Soper, former Director (from 1947 to 1958) of the Pan American Health Organization, Regional Office of the World Health Organization for the Americas. In addition to his service with PAHO/WHO, Dr. Soper (1893–1976) played a large role in the fight against yellow fever and other infectious diseases in Brazil as part of his work with the Rockefeller Foundation in the 1920s and 1930s and in the control of typhus in North Africa and Italy during the Second World War. He was one of the truly major figures in inter-American health in this century.

The award is presented annually to the author or authors of an original scientific contribution containing new information on, or new insights into, the broad field of public health, with special relevance to Latin America or the Caribbean or both. This work may be a report, an analysis of new data (experimental or observational), or a new approach to analyzing available data. Preference is given to studies involving more than one discipline and to papers related to infectious disease, a life-long concern of Dr. Soper.

Only papers published during calendar year 1995 in scientific journals listed in the Index Medicus or in the official journals of the Pan American Health Organization are eligible for consideration for the 1996 award. Furthermore, the award is limited to works by authors whose principal affiliation is with teaching, research, or service institutions located in the countries of Latin America and the Caribbean (including the Centers of the Pan American Health Organization).

The Award Fund is administered by the Pan American Health and Education Foundation (PAHEF), which receives voluntary contributions designated for this purpose and holds them in a separate fund. The award consists of a certificate and a monetary prize of US$ 1 000. Candidates are nominated by an Award Committee composed of representatives designated by PAHO and PAHEF; final selection of the winner(s) is made by the Board of Trustees of PAHEF.

Papers meeting the above criteria and submitted by or on behalf of their authors may be considered for the Fred L. Soper Award. All submissions must be received by 31 March 1996 at the following address:

Executive Secretary
PAHEF
525 Twenty-third Street, N.W.
Washington, D.C. 20037
U.S.A.