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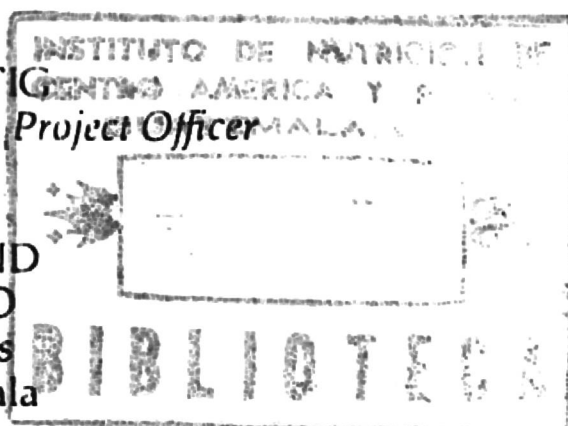
heighten their awareness of referral if home treatment fails. Intensive in-service training for community health workers, village health volunteers, traditional healers, herbalists, private practitioners, and health center workers is needed. Those personnel are the second-contact persons in the management process. The referral system needs strengthening; the production of ORS needs to be increased; and the production of packets for individual use and the introduction of bulk/large quantity preparations for use in settings where numerous cases are treated needs to be promoted. The logistic system in ORS distribution down to PHC level needs improvement. Finally, periodic monitoring of the performance of staff involved in ORT and the supervision of home-care components by competent field health workers is required.

Further development and refinement of this approach to efficient management of cases of acute diarrheas in children might speed up a decrease in mortality and hasten the "Health for All/2000" objective of the overall improvement of health conditions in our countries.

SINAPS EVALUATION: RESULTS OF COMMUNITY DISTRIBUTION OF ORAL REHYDRATION SALTS IN GUATEMALA*

DR. AARON LECHTIG
UNICEF Child Health Project Officer
Brasilia, Brazil

JOHN W. TOWNSEND
JUAN JOSE ARROYO
INCAP Health Officers
Guatemala, Guatemala



In our experience, three factors are crucial to ensure success in the community distribution of ORS:

1. Adequate information, training, and supervision of the mothers with continuing positive reinforcement of their motivation;
2. Continued support from health professional personnel, in particular, adequate treatment and follow-up of referrals; and
3. Appropriate supply of ORS to cover all households on a regular basis.

Thus, isolated "vertical" campaigns may have a very limited impact unless they are designed within the context of a coherent, regular primary health care approach to ensure continuity to the process. What follows is a description of a community distribution intervention in which attempts were made to fulfill these main requisites.

ORS were distributed at household level by 377 community voluntary health workers called health promoters to a population of 68,465 inhabitants as part of the routine operations of SINAPS, a primary health care system in the eastern part of Guatemala.¹ In this population, dehydration due to diarrhea is a main cause of infant and childhood mortality. Because ORS were not regularly available in adequate amounts in the country, a simplified formula² was developed for local production by health centers and distribution by health promoters.³

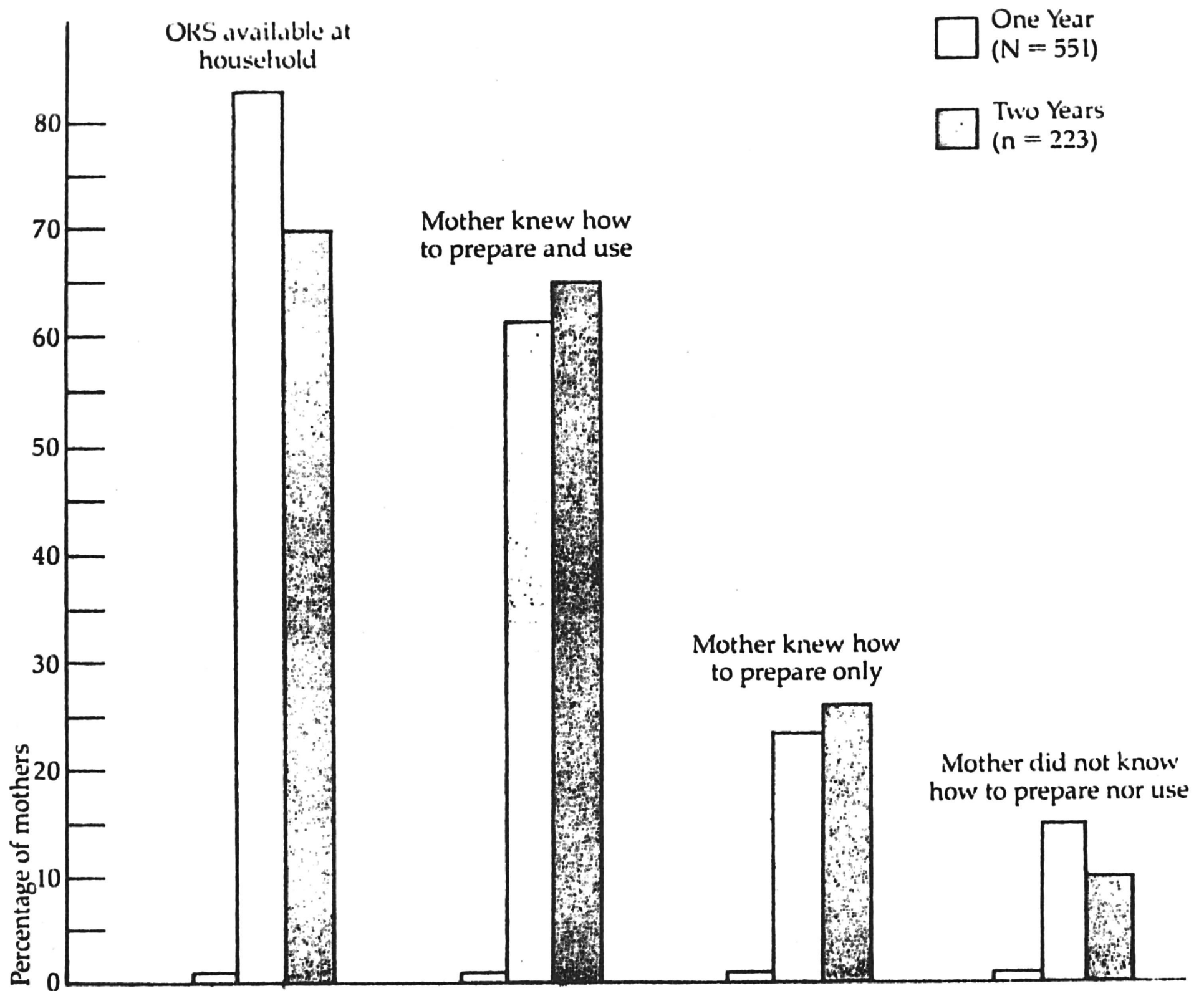
All health personnel were trained in local production, household distribution, and education to mothers on how to use ORS. For this purpose, specific guidelines, training, and information materials were developed, including posters, for wide information to the community on ORT.⁴ These materials were designed to be relevant to local beliefs and customs. A first step in the process of motivating parents focused on alerting them to the dangers associated with diarrhea. Then, information on oral rehydration treatment was provided. This information, built upon traditional beliefs on household treatment, reinforced positive motivation and was accompanied by delivery of ORS to the mother. Each family received a package of six 250 ml bags per child under five years of age. This volume was selected because of the wide availability of glasses of this size. It also limited unnecessary wastage of ORS. Simple, printed material on how to prepare and use ORS was also delivered and carefully explained to the mother. The health promoter was close to the mother to provide advice and support the first time she started ORT for her child with diarrhea. In this way, mothers gained awareness and understanding of ORT and easily became believers and active promoters of ORT.

Data in Figure 1 indicate that before the intervention the availability and knowledge of ORS were about zero. Though ORS were available at the pharmacies, sales were very low (equivalent to less than 25 ml per family per year) because of extremely high costs (\$0.60 to \$2.00 per liter) and no commercial advertising. One year after the intervention, 83.7% of the families with children under five years of age had ORS available at home. About two-thirds of the mothers knew how to use ORS, an impressive result in these populations. Of the rest, two-thirds knew how to prepare the solutions, but not how or when to use it, and the other third did not know how to prepare or how and when to use the ORS delivered to them.

Data in Figure 2 indicate that the use of ORS at home increased notably from less than 1% to more than a third of the cases of diarrhea in the first year after the intervention. Additional data indicated high rates of consumption, rising to 57% and 83% of delivered ORS during the first

Figure 1

AVAILABILITY AND KNOWLEDGE ON ORS



1 - The figures for baseline are assumed to be around zero percent. (See text).

and second years, respectively, after the intervention. Data in the same Figure 2 indicate that use of drugs from the pharmacies and use of health facilities for treatment of diarrhea were reduced considerably, a decrement persisting two years after the intervention. The reduction in use of services for treatment of simple diarrhea occurred in spite of an overall increase of 9.1% in use of services during the same time period. Therefore, though the implementation of the primary health care system stimulated the demand for health services, the household distribution of ORS and massive education campaign reduced specific utilization of services for treatment of diarrhea. Data in Figure 2 also indicate a decrease in child mortality in the target population to half of the baseline figures. Wide availability and consistent use of ORS by the mothers may have contributed to this impressive decrease in mortality. However, additional data is required to ver-

ify the consistency of this decrement, since yearly fluctuations in mortality are not unusual in a population of this size (n = 68,465).

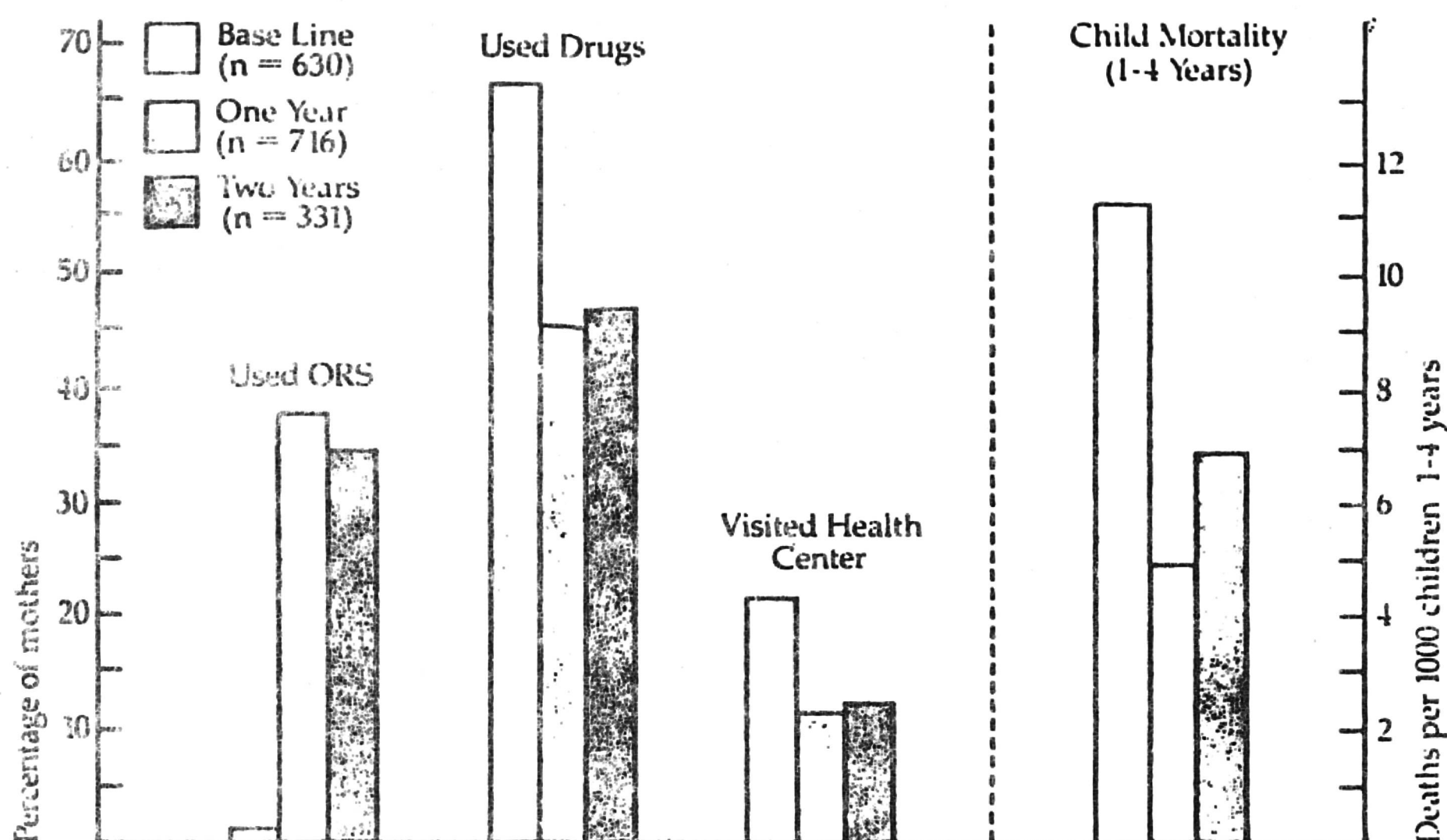
The main advantages encountered with this approach of local production and community distribution of ORS were:

1. Self-sufficiency at the health center level to provide ORS to all families within usual budgetary constraints of health centers in Guatemala. In this way the SINAPS health centers were not affected by severe problems in central production and distribution that made ORS unavailable in the rest of the country.
2. Community participation in prevention and treatment of a major health problem, a factor that allowed for almost total coverage of target population within routine activities of health center personnel.

At the same time, the increment in number of production centers represented a major complica-

FIGURE 2

WHAT DID YOU DO THE LAST TIME YOUR CHILD HAD DIARRHEA?



Changes were statistically significant ($\chi^2 = 296.7$; $df. = 2$; $< .01$).

The question refers to children under five years old with more than two consecutive days of diarrhea.

tion for standard quality control procedures. To solve this problem, quality control was radically simplified. It was found that routine weighing of random samples of packages of six bags and control of the amount of potassium chloride used for each day's production provided most of the information required for supervision. Production rates were about three hundred bags per worker per day. Rates of deterioration were low: 3% of a sample of bags after fifteen months of storage under usual working conditions that included rough handling and rodents. However, most of the ORS produced were distributed within one month of production.

The capital cost of setting up local production was \$550 per production unit, while variable costs were 1.5 cents per 250 ml bag. Total additional costs required to implement this model were 47 cents per capita per year, or about 0.2% of the per capita budget of the Ministry of Health of Guatemala.

Because of these characteristics, this approach may become a suitable alternative for those countries where central production is not feasible. It can also be appropriate as a temporary alternative to supply ORS while central production develops and becomes adequate to satisfy demand for wide availability at the family level.

Appendix 1

BASIS TO ESTIMATE COST OF HOUSEHOLD LEVEL DISTRIBUTION OF ORAL REHYDRATION SALTS IN SINAPS

(U.S. dollars)

A.1	Fixed cost production unit	\$550.00
A.2	Average health district population	10,000 inhab.
A.3	Fixed cost per capita over five-year period — $550.00/5 \times 10,000$	1.1 cents
B.1	Variable cost per bag (250 ml)	1.5 cents
B.2	Number of bags per child under five per year (six bags per episode, two deliveries per year)	12 bags (3 lts)
B.3	Cost in bags per child per year	18 cents
B.4	Cost in bags per capita per year	3.6 cents
C.1	Total additional cost (A.3 + B.4)	47 cents

C.2 MOH budget per capita per year (Guatemala)	\$20.00
C.3 Percentage of per capita MOH budget	0.235%

Appendix 2
SUMMARY OF SINAPS
(Population: 68,465)¹

	<i>Before</i>	<i>After</i>
1. Immunizations		
Pregnant Women* ¹	—3	65%
Children 0-4 yrs* ²	58-70%	80-98%
2. Availability of ORS (% use)*	—3	84% (38%)
3. Malnourished persons in treatment (detection coverage)	—3	100% (60-84%)
4. Mortality:		
Childhood (1-4 yrs)*	11.4	4.9
Infant (0-11 months)	55.0	51.1
5. Use of contraceptive methods*	12.4%	21.6%
6. Cost ⁴ : First year		\$0.99
Subsequent years		\$0.72

*P < .05

¹As of September 1982: 377 health promoters and 226 folkmidwives. Attendance to training meetings: 86-91%.

²They include DPT, Measles, Polio, and BCG for children; and Tetanus Toxoid for pregnant women.

³Exact figure unknown, but assumed to be almost zero.

⁴Net additional cost per capita per year.

BRINGING ORAL THERAPY TO THE COMMUNITY LEVEL

DR. RICHARD A. CASH
Fellow Harvard Institute for International Development
Director, Office of International Health
Harvard School of Public Health
Boston, Massachusetts

The key to the reduction of deaths from diarrhea is that the individuals with this disease have ready access to effective therapy. By reducing cost, by simplifying preparation, and by making therapy less dependent on highly trained personnel, oral rehydration therapy has increased access. And ORT is clearly effective when used correctly in the appropriate situation.

We are continually striving for ways to increase access to care while maintaining maximum effectiveness. You have just heard about one approach to maximizing access: the introduction of oral therapy into the home, with the targeting of mothers as the primary health care

providers.

The arguments for home based care are compelling: treatment is taken where disease occurs so that there can be immediate intervention; and the mother is directly involved in the child's care, thus educating her for subsequent episodes of illness and giving her a sense of control over the health of her family.

There are arguments against home-based care, however, and they cannot be dismissed. The further one gets from the health establishment, the greater the potential for mistakes in the preparation of oral rehydration solution and in its use. The emphasis on home-based care resulted in less use of the complete formula, a situation which some have viewed as potentially dangerous, especially if the patient has heavy purging. Even if women can be taught how to prepare and use ORS, they may not use it properly. No study has yet demonstrated that education necessarily results in effective use. Lastly, some have argued that there are potential political problems in placing too much emphasis on home-based care. If mothers are defined as providers of all care, government and the health professional may absolve themselves of responsibility.

All of these objections can be dismissed, however, if professional health care providers are directly involved at the periphery. In addition to providing primary care, health workers are a backup to mothers in those areas where home-based care is important. Backup facilities should be available for children or adults who do not respond to ORS or are heavy purgers. The mother gains confidence from knowing that health care providers are available to answer questions about the use of ORS. And if health care personnel are actively involved in ORS therapy, they are more likely to become supporters of its use.

The concepts needed to use ORS are often the opposite of established practices. Giving fluids and food to the diarrhea patient are counterintuitive to many. ORT programs can be easily discredited by bad results caused by improper use or uninformed, even hostile, health care providers. The likelihood of bad results can be minimized by appropriate training of these health workers. A truly effective community-based system, then, depends on the proper mix of home-based care and care provided by practitioners in the field or in fixed facilities.

I do not believe in an either/or situation: home-based or clinic-based, mothers or practitioners. A system must develop an integrated approach: integrated between home and practitioner, diarrhea and other aspects of primary care, therapy and prevention, health and other development activities. And all approaches at the community level must be adapted to the local situation.