BEST PRACTICES in SCALING UP CASE STUDY

EGYPT

Control of Diarrheal Diseases Goes National

INTRODUCTION

Diarrhea is one of the most prevalent childhood diseases in the developing world, having the potential to rapidly progress from mild to moderate to severe and even death in a matter of days. Into the early 1980s, dehydration due to diarrhea was the cause of nearly half of all deaths among Egyptian children under age five.

Throughout the 1970s, evidence was building of the efficacy of oral rehydration therapy (ORT)—the use of oral rehydration salts/solution (ORS) together with continued feeding—as the treatment of choice for mild and moderate dehydration, and even as an effective substitute for intravenous rehydration in some severe cases. ORT was introduced in Egypt in the late 1970s. Community trials in 1979-80 showed that educating caretakers about ORT and case management could result in a 50% decrease in diarrhea-related mortality. Nonetheless, at that time, ORS was used in only 10-20% of cases of childhood diarrhea in Egypt.

To build on these early efforts, the National Control of Diarrheal Disease Project (NCDDP) was established in 1981. With funding from the United States Agency for International Development (USAID) to supplement the resources of the Government of Egypt (GOE), the challenge was to take ORT—a proven but not widely known or utilized intervention—and raise its visibility and use nationwide. In September 1982, JSI joined with the Egyptian Ministry of Health (MOH) with the common goal of ensuring that at least one-half of all diarrhea cases be treated with ORS to reduce diarrhea-related infant and childhood mortality by 25% within five years.

Why It Mattered

Diarrhea was the leading cause of death among children under five in Egypt in the 1970's and early 80's. From 1982 to 1990, the National Control of Diarrheal Disease Project (NCDDP) and the Ministry of Health, with the assistance of JSI, implemented a nationwide program to promote the widespread use of oral rehydration therapy. By 1990, ORS was used by providers countrywide. There was a nearly 60% reduction—representing about 300,000 lives—in diarrheal disease mortality between 1983 and 1988, and diarrhea was no longer the leading cause of death among children under five.

When the NCDDP began, Egyptian mothers were largely unaware of the phenomenon of dehydration, the underlying cause of most diarrheal deaths. Mothers generally did not seek medical attention until the symptoms of advanced dehydration were manifest. Both mothers and the medical community subscribed to the tradition of withholding food during bouts of diarrhea, a practice that contributes to both the severity and duration of the illness. When children were seen by doctors, they were prescribed antidiarrheals and antibiotics, and when dehydrated, they were rehydrated intravenously.

Scaling-up efforts began in earnest in 1984 with the implementation of a wide range of effective strategies to communicate the NCDDP's messages about ORT to a population of 41 million, and a professional community of 30,000 physicians, 35,000 nurses, and 5,000 pharmacists nationwide. The health messages aimed to bring about massive behavior change among these diverse stakeholder groups.

RESULTS

The *British Medical Journal* touted the NCDDP as "the world's most successful health programme." Over the seven-year scale-up period, the number of diarrheal deaths in infants and children under five had dropped by nearly two-thirds, while diarrheal deaths as a percentage of all deaths among children under five dropped from 45% to 28%. The lack of any other intervention strongly suggests that these declines can be directly attributable to the work of the NCDDP.

Changes in caretaker knowledge and behavior

The project had two primary goals: build caretaker awareness of ORS to 90% and increase understanding of its use to 75% of caretakers. These goals were met and surpassed. After 1985, nearly 100% of mothers nationwide were aware of the dangers of diarrhea, knew the signs of dehydration, and knew about the importance of ORS. By 1986, 90% of mothers randomly sampled could mix ORS correctly on the spot.

A variety of large-sample household surveys of ORS use were done over the years, but there was little comparability among them. However, two local area studies may be indicative of changes in usage pattern. In Menoufia governorate in 1979, only 17% of mothers indicated that they had "ever used" ORS during a diarrhea episode; in 1988, that figure had risen to 80%. In Dakahlia governorate in 1980, 21% of mothers reported that they had used ORS during recent bouts of diarrhea; in 1986, 71% of mothers survey stated that they had "ever used" ORS. Continued feeding, especially breastfeeding, is an integral part of ORT. In the five years prior to the project, 40-65% of mothers withheld breastmilk during bouts of diarrhea; by 1988-89, that figure had dropped to less than 10%.

Changes in provider knowledge and behavior

The project sought to both increase ORS use and reduce the providers' practice of prescribing non-evidence-based antimicrobials, constipatives, and antiemetic. A facility-based study indicated that 84% of mild to moderate cases of dehydration received some ORS on-site. Antibiotics were still used inappropriately in as much as 31% of the cases; however, this figure represented a decrease from the pre-project range of 65-85% of inappropriate usage.

Declines in morbidity

The project did not have a specific goal to reduce morbidity; however, early intervention with ORT could be expected to reduce the number of cases that progress to severe dehydration. In fact, data from two major hospitals show a significant decline in the number of severely dehydrated children seen during the project period—72% in one hospital and 76% in the other.

One teaspoon a minute of oral rehydration therapy will rehydrate a seriously dehydrated child within hours.

Declines in diarrhea-related mortality

In the ten years preceding the project, deaths due to diarrhea were declining at an average rate of 5.1% per year. In 1984, the diarrhea-related infant mortality rate stood at 25.7 diarrhea deaths per 1,000 live births, and the age-specific death rate for children between 1-4

Table 1 *Decline in Diarrhea-Related Mortality*	*1974 ⇨1983 (pre scale-up)*			*1984 ⇨ 1990 (scale-up period)*		
	Absolute	*10-year % decline*	*Av. annual % decline*	*Absolute*	*7-year % decline*	*Av. annual % decline*
Infant mortality (deaths per 1000 live births)	59.6 ⇨ 29.1	51%	5.1%	25.7 ⇨ 9.3	64%	9.1%
Age-specific death rate, children age 1-4 (deaths per 1000)	11.8 ⇨ 4.0	66%	6.6%	4.0 ⇨ 1.1	73%	10.4%

years was 4 deaths due to diarrhea per 1000 children in that age group. In 1985, both rates dropped dramatically; infant deaths due to diarrhea decreased 40%, while diarrheal deaths in children age 1-4 decreased 33%, surpassing the project's five-year goal of 25% in that one year alone. The decline continued each year thereafter, averaging 9.1% annual decline in infant mortality from diarrhea and 10.4% annual decline in diarrheal deaths in children age 1-4 over the seven-year period, **(Table 1)**.

Declines in overall infant and child mortality

The reduction of diarrhea-related deaths in infants and children had a significant impact on overall infant and child mortality. As with the diarrheal mortality rate, the overall mortality rate for infants and children had been declining slowly. In the ten years before the project began scale-up efforts, there was a 36% reduction in overall infant mortality, an average of 3.6% per year; overall age-specific mortality for children age 1-4 declined 55%, an average of 5.5% per year. Over the seven-year project period, the average annual decline in the overall infant mortality was considerably more rapid than in the proceeding period; the average decline in the age-specific death rate for children 1-4, while not as dramatic in terms of percentage change, was certainly notable (**Table 2).**

SCALE-UP PROCESS

To better assure sustainability, the NCDDP's strategy was to work within the existing Egyptian health infrastructure to strengthen the capabilities of those responsible for service delivery, including public and private health providers, pharmacies, and pharmaceutical companies, as well as schools of medicine, nursing, and pharmacy. Recognizing the importance of the informal health sector in reducing morbidity and mortality from diarrheal diseases, the NDCCP also targeted lay practitioners, the community, families, and mothers.

PREPARATORY PHASE: 1982-1984

Start-Up and Pilot Study

The preparatory phase set the stage for the scale-up process and involved setting up basic structures, conducting baseline research, developing training and mass media strategies, contracting for the production of ORS and other supplies, and designing programmatic approaches to make ORT widely accessible:

1) Form an Inter-Ministerial Steering Committee: A national steering committee chaired by the Minister of Health, with representation from the public and private health sectors as well as from academia, was established to guide implementation. The committee increased the NCDDP's credibility, fostered broad-based collaboration, and paved the way for sustainability.

2) Establish the NCDDP Structure, a semi-autonomous unit of the Ministry of Health with a senior MOH official, who was appointed directly by the Minister, as the Executive Director. The NCDDP director was responsi-

Table 2 *Decline in Overall Mortality Rates*	*1974 ⇨1983 (pre scale-up)*			*1984 ⇨ 1990 (scale-up period)*		
	Absolute	*10-year % decline*	*Av. annual % decline*	*Absolute*	*7-year % decline*	*Av. annual % decline*
Infant mortality (deaths per 1000 live births)	101 ⇨ 65	36%	3.6%	62 ⇨ 34	45%	6%
Age-specific death rate, children age 1-4 (deaths per 1000)	22 ⇨ 10	55%	5.5%	10 ⇨ 5	50%	7.1%

ble for coordinating the activities of all institutions involved in diarrheal-disease control activities. Implementation took place through five technical units (field coordination; production and distribution; mass media; training; research and evaluation) and two support units (administration and finance; monitoring, management information systems). Supplementing the MOH staff were local technical experts, hired on a contractual basis, and JSI's technical advisors, who were fully integrated into the NCDDP structure.

3) Implement NCDDP activities:

Field Coordination

- Developed an operational definition of a "rehydration center," a section within a hospital or health center where infants and children are triaged according to the severity of dehydration. The rehydration center was also a place where the mothers of children with mild, moderate, and even severe cases of diarrhea learned to properly mix ORS and administer it under supervision until the child is out of danger.
- Established rehydration centers in eight major hospitals around the country as well as in several rural health centers and MCH centers.
- Identified 26 governorate coordinators, senior MOH staff who were responsible for local program implementation. Incentives were paid for by the NCDDP, and a supervisory system was put in place.
- Created a cadre of "depot holders," citizen-volunteers trained to screen children with diarrhea, instruct mothers how to mix and administer ORS, and refer to the nearest health unit as necessary.

Production and Distribution

- Established new public-sector brand to complement the private sector ORS brand "Rehydran." Using the colloquial Egyptian terms *gaffaf* (drought) and *mahloul* (solution), the ORS was named *Mahloul Moalgett el Gafaff* or "solution for treating dehydration"—*Mahloul* for short.
- Developed 200ml packet of salts to replace the traditional UNICEF 1 liter package based on a "container study," which found that 200ml soda bottles were readily found in the average home.
- Through contracts with private sector and parastatal companies, assured availability of raw materials needed to produce and package the ORS until market forces made it profitable to continue production.
- Contracted for the production of 200ml cups, spoons, rehydration chairs for mothers, and record books needed to operate the rehydration centers.

Mass Media

During Phase I, the main objectives were building awareness, introducing the concept of dehydration, emphasizing the need for rehydration and continued nutrition, and directing families toward the appropriate health facility for treatment.

- Developed and tested IEC materials.
- Conducted a pilot mass-media campaign in Alexandria, primarily radio supplemented with billboards, posters, and flyers:
  - Tested the effectiveness of radio and print channels. A second pilot confirmed that television, accessible to 9 out of 10 Egyptian families, was far more effective than other media.
  - A well-known male comedian was hired to convey the NCDDP's messages to the public.
- Designed the project logo, which became universally recognized throughout the country.

A billboard promotes the NCDDP campaign for oral rehydration solution to prevent child dehydration. ©1985 CCP, Courtesy of Photoshare

Training

- Agreed on the primary training messages: Use of ORS plus continued feeding as the principal method of case management, limited use of "anti-diarrheal drugs," and prevention of diarrhea through sustained breastfeeding and good hygiene.
- Emphasized four skill sets: Examination and triage, case management, teaching mothers, and recognizing when to refer.
- Newly established rehydration centers were the primary site of on-the-job training for hospital staff and medical students, so they could observe the rapid and dramatic improvement with ORS.

Research and Evaluation

The research agenda focused on clinical interventions and on developing an understanding of the market.

- Provided clinical research grants to academic institutions: Developed a superior intravenous solution, proved the uselessness of a popular anti-emetic, showed ORS could be used to treat hypernatremia, and demonstrated that even neonates could tolerate rehydration with ORS.
- Contracted with local research institutions for epidemiological surveys, operations research, sociocultural studies (KAPs, focus groups, ethnographic research).

PHASE TWO: 1984-1989

National Scale Up

Field Coordination

- Created 37 additional hospital-based rehydration centers around the country: Renovated space, provided equipment, and trained staff.
- Expanded "depot holder" program to eight of Egypt's then 26 governorates.

Production and Distribution

- Established a system for projecting quarterly and annual ORS production needs, based on usage and inventory monitoring at 3,400 service points.
- Produced an average of six million liter equivalents of ORS in 200ml packets annually through Egypt's parastatal pharmaceutical manufacturer to satisfy the collective public/private sector demand, up from two million liter equivalents per year for the previous two years.
- Put in place an effective distribution system. ORS packets were available in almost every public-sector clinic and private-sector pharmacy in the country.
- Provided incentives for private pharmacists to sell ORS by giving them, free of charge, 200ml cups that could be sold at the local equivalent of 2¢, nearly doubling their profit. Eventually, the cups could be found in one-third of all Egyptian homes.

Mass Media

During Phase II, the objective of mass media was to create demand for ORT. A broad communications strategy that integrated mass media, training, and market research was developed and implemented.

- Conducted sociological and anthropological research—messages, vocabulary, visuals, and media channels.
- Ensured technical review and sign-off from an expert panel of pediatricians, public health professors, communications specialists, and MOH officials before going public.
- Designed, produced, and aired over 63 prime-time television spots that covered signs and seriousness of dehydration, use of ORS to prevent/treat dehydration, mixing and administering ORS, feeding during diarrhea, and the role of other drugs in preventing diarrhea. Spots featured a popular soap opera star who personified a good and loving mother.
- Used print media selectively to tailor messages to specific audiences.

Training

- Produced a large body of high-quality training materials: Training-of-trainers package; competency-based curricula for physicians and for nurses, case

management guidelines, manuals, self-instructional modules, and posters; slides, audio and video cassettes; pamphlets, and newsletters.

- Prepared 14,000 practicing nurses for their role in providing ORT and taught mothers to mix and administer ORS.
- Increased the length of the diarrheal diseases component of the MOH's six-week pre-service training program from two hours to two days. 3,000 - 4,000 newly graduated physicians posted to primary care centers around the country each year received this training.
- Trained 10,000 practicing physicians with 4-6 days of practical hands-on case management.
- "Professional sales representatives" visited 18,000 private physicians and pharmacists in urban areas to convey the NCDDP's three basic case management principles.
- Trained over 3,000 "depot holders" in 9 governorates to serve their communities as first-line providers of ORT and as referral sources for more serious cases.

Research and Evaluation

In addition to the continuing emphasis on clinical research, the research agenda focused on measuring the impact of the program. Research support grants were given to university departments. Impact studies in two governorates, as well as one of nationwide scope, were conducted.

PHASE THREE: 1989-1991

Institutionalization

The third and final phase focused on institutionalizing project activities. To some extent, this was an exercise in scaling back to a level of effort that could be sustained, managerially and financially, by the MOH. Scaling back was tenable because of the success of NCDDP's activities in the first two phases in changing the community's and the health sector's approaches to treatment of childhood diarrhea. While day-to-day work continued, a number of key steps toward institutionalization were taken:

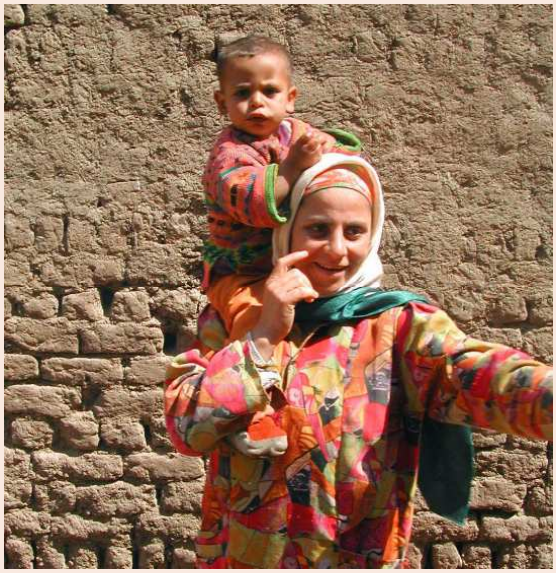
- A series of conferences, sanctioned by the Minister of Health, were held, at which MOH officials and representatives of international agencies developed recommendations for institutionalization, culminating in a draft of a detailed institutionalization plan.
- The General Directorate for Diarrheal Disease was created within the MOH, assuring autonomy and authority in the implementation of diarrhea control activities.
- The specific line item for diarrhea control in the MOH budget, created for the initiative, was made permanent, and substantial funding was allocated to it. This precedent had significant implications for sustainability.
- Subsidized ORS production was cut back. The price of ORS in the marketplace was allowed to increase in stages, to cover the cost of manufacturing and allow for some profit, but was capped at an affordable level.
- Incentive payments to MOH personnel were discontinued for reasons of financial sustainability and employee parity.

With the planned withdrawal of JSI involvement in late 2001, the work of the NCDDP was subsumed into the MOH portfolio where it remains today and will be sustained into the future.

WHAT WORKED

- **Proactively fostering collaboration** between the public and private sectors, as well as the international donor community, enhanced the credibility of the NCDDP's messages and interventions. In this way, the NCDDP enjoyed a broad-based sense of ownership of its activities and embraced joint problem-solving to resolve issues, both of which enhance the sustainability of the program.
- **Researching informed strategies, clinical interventions and program decisions** every step of the way.

- **The branding of the project's ORS packet** differentiated it from other ORS packets on the market. The term *Mahloul* was acceptable to caretakers and physicians alike.
- **Creating demand among mothers led the way.** Mothers proved easier to convince of the effectiveness of ORT than physicians. In response to the strong demand created among mothers, health care providers more rapidly changed their case management practices. Television was the most effective media for not only creating demand, but also for instructing mothers in mixing ORS.
- **Rehydration centers served a number of important purposes** and were an effective way to concurrently provide case management, patient education, and provider training.



Mothers were taught to recognize the signs of dehydration and how to administer ORS.

WHAT WE LEARNED ALONG THE WAY

- The semi-autonomous nature of the NCDDP had mixed results—it was less subject to bureaucratic obstacles and diversion of resources, but lacked authority over local MOH staff, who were ultimately responsible for delivering services.
- Understanding the cultural context is key to effective communications. Messages should provide simple information in everyday language.
- Using a celebrity spokesperson can be extremely effective, but s/he must have credibility for the particular context. Initially, a famous Egyptian comedian was hired to convey the message of ORT. The use of a comedian to discuss medical issues caused an outcry, especially from the professional community. During the scale-up phase, a well-known motherly character actress was recruited for the NCDDP television spots, which proved immensely popular.
- Discovering measuring containers that were already in most homes made all the difference. Early research showed that containers needed to measure water for UNICEF's 1 liter ORS packet were not common, but most people had 150-200 milliliter cups and soda bottles. With the decision to package ORS in smaller 200ml packets, the proper mixing of ORS could be assured.
- Deeply entrenched educational approaches take time and persistence to change. Medical education in Egypt relied heavily on lectures. The unfamiliar competency-based curriculum took several years to develop and implement effectively.

CHALLENGES

- It was difficult to ensure a continuous supply of ORS. Timely production was constrained by obstacles in negotiating production contracts, restrictions imposed by USAID procurement regulations, the need to import most of the raw materials for the ORS, and financial limitations. Declaring ORS an essential drug went a long way in overcoming these obstacles.
- The weakest link in the ORS distribution chain was delivery from governorate central stores or district warehouses to rural health units. This problem continued throughout the project.
- The training pyramid strategy proved difficult to implement. It was expected that providers who were trained would in turn train others, but this did not

work beyond the hospital level because providers faced travel difficulties and were unable to leave their clinical duties. Moreover, the seasonal nature of diarrhea limited patient availability for practical sessions.

- The production of high-quality training curricula and audio-visual materials took much longer than expected. Consensus on technical content and translations of English drafts was an essential, yet lengthy, process; local firms did not have the capacity to produce high-quality print and media products.
- Sustainability of the volunteer Depot Holder Program could not be assured. Despite its success, integrating a rural volunteer system into the structure of the MOH proved problematic.

CONCLUSION

The National Control of Diarrheal Disease Project in Egypt, with JSI's shepherding and technical assistance, succeeded in scaling up the production of oral rehydration salts, increasing mothers' correct use of these salts, and changing feeding behavior nationwide. By the end of the project, virtually all mothers in Egypt were aware of ORS, and most could correctly mix the solution. Given the absence of other changes taking place at the time, it can be concluded that the NCDDP was primarily responsible for these successes. The NCDDP no longer exists as a separate entity; diarrheal disease control is now fully integrated in the Ministry of Health and is a sustainable part of its regular activities.

RESOURCES

Information for this article was taken from:

Taming A Child Killer: The Egyptian National Control of Diarrheal Diseases Project, JSI, 1995.

"The Effect of a National Control of Diarrheal Diseases Program on Mortality: The Case of Egypt" Peter Miller and Norbert Hirschhorn, Social Science and Medicine, Vol. 40, No.10. 1995.

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