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ASSURING ACCESS TO PEDIATRIC ZINC FOR DIARRHEA TREATMENT THROUGH THE PRIVATE SECTOR IN MADAGASCAR RESULTS AND LESSONS LEARNED

PROGRAM CONTEXT

Madagascar is the fourth largest island in the world and ranks 145th out of 182 countries on the 2009 Human Development Index. Its total population is estimated at 20.6 million.¹ Data from the Madagascar Demographic and Health Survey (MDHS) 2008-09 (National Statistical Institute et al. 2010) indicate that the diarrhea prevalence rate for children under five as of 2009 was 8 percent (ranging from 18 percent in the Boeny region to 2 percent in the Vakinankaratra region). In 2008, 22 percent of child deaths were caused by diarrhea-related illness,² and diarrhea was the second leading cause for consultation at health centers (Ministry of Health and Family Planning 2008). This is not surprising, given that, according to UNICEF's State of the World's Children 2009, only 38 percent of

rural populations in Madagascar have access to improved drinking water sources and only 10 percent of these same populations have access to improved sanitation facilities (UNICEF 2009).

Madagascar was one of the first countries to embrace the recommendations of the 2004 World Health Organization (WHO)/UNICEF Joint Statement³ on diarrhea management. It revised its Integrated Management of Childhood Illness (IMCI) materials to include the introduction of low-osmolarity oral rehydration solution (ORS) and zinc to treat uncomplicated diarrhea, included zinc on its Essential Medicines List, and revised policy to allow community health workers (CHW) with the appropriate training, and

³ A series of effectiveness trials in developing countries found that treatment of childhood diarrheas with a 10–14 day course of zinc along with oral rehydration solution (ORS) resulted in a 25 percent reduction in duration of acute diarrhea, a 29 percent reduction in duration of persistent diarrhea, and a 40 percent reduction in treatment failure or death in persistent diarrhea. These findings led to the 2004 recommendation by WHO and UNICEF to include zinc with the new low-osmolarity ORS as the new standard treatment for all childhood diarrheas: http://whqlibdoc.who.int/hq/2004/WHO_FCH_CAH_04.7.pdf

¹ The World Factbook, CIA, 2010 estimate. <https://www.cia.gov/library/publications/the-world-factbook/geos/ma.html>

² World Health Organization/Child Health Epidemiology Reference Group, Countdown to 2015 Maternal, Newborn & Child Survival. <http://www.countdown2015mnch.org/reports-publications/2010-country-profiles>.



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under the supervision of primary health clinic (*centre de santé de base*, or CSB) personnel, to directly diagnose and treat uncomplicated cases of pneumonia, malaria, and diarrhea. Pilot public sector programs to treat diarrhea with zinc and ORS began in Madagascar in 2006. Technical assistance and training of Ministry of Health and Family Planning (MOHFP) personnel in selected health districts was provided by the United States Agency for International Development's (USAID's) Basic Support for Institutionalizing Child Survival (BASICS) Project and UNICEF from 2007 through 2009.

Data from the 2009 MDHS indicated that 59 percent of caregivers either treated at home or provided no treatment. Of the 41 percent who did seek care, 61 percent did so in the public sector, while 27 percent did so from a private sector source. According to the 2009 MDHS, urban caregivers were as likely to seek care from a private sector source as a public sector source (both 25 percent) but rural caregivers were more likely to seek care from a public sector source (25 percent) than a private sector source (9 percent), either clinic or

pharmacy. While 42 percent of caregivers knew about ORS, only 17 percent had used ORS during the recent bout. Only 1.4 percent had given the child a zinc treatment.

Data from a Population Services International (PSI) maternal and child health-related household survey conducted in November 2008 provided similar findings. Of those who sought treatment outside of the home in this survey, 10 percent sought treatment in the private sector, 39 percent relied on the public sector, and 51 percent relied on neighbors or friends (see Table 1).

In terms of diarrhea treatment, the PSI survey revealed that of caregivers with children with diarrhea in the past two weeks only 8 percent used ORS⁴ while 37 percent treated with an antibiotic, 18 percent with an anti-diarrheal, and 28 percent with an unidentified pill or syrup (Table 2) less than 0.5 percent had treated with zinc. The public health system was the source for 84 percent of ORS treatment; only 7 percent of ORS was obtained from the private sector. In contrast, respondents went to both public and private sector providers to obtain antibiotics, anti-diarrheal treatments, and other pills/syrups.

In December 2007, the USAID Mission to Madagascar invited the Social Marketing Plus for Diarrheal Disease Control: Point-of-Use Water Disinfection and Zinc Treatment (POUZN) Project, implemented by Abt Associates Inc. and PSI, to develop a private sector program to increase access to diarrhea treatment products for caregivers of children under five through both commercial and community distribution channels. The POUZN team conducted an assessment of the potential for promoting zinc through the

TABLE 1: CARE SEEKING BEHAVIORS FOR DIARRHEA TREATMENT IN MADAGASCAR AMONG THOSE SEEKING CARE OUTSIDE THE HOME

	2009 MDHS*	2008 PSI Household Survey**
Sought care from public sector health center	61%	39%
Sought care from private provider	27%	10%
Sought care from neighbor or friend	N/A	51%

Sources: National Statistical Institute (2010); PSI (2008)

* Based on additional MDHS data analysis by Abt Associates. Percentages reflect responses of all caregivers.

**These studies were not conducted in the same geographic areas but are presented here to indicate general care seeking behaviors among respondents.

⁴ 2004 MDHS data indicated 12 percent of respondents used ORS to treat pediatric diarrhea

TABLE 2: SOURCES OF DIARRHEA TREATMENT OF THOSE SEEKING TREATMENT OUTSIDE THE HOME, BY TREATMENT TYPE; N=519

	ORS	Antibiotic	Anti-diarrheal	Pill/Syrup
% using treatment	8.0	37.4	18.0	27.5
Source of Treatment				
Public hospital	50.2	21.3	22.7	25.5
Public health center	32.6	18.5	19.1	22.8
CHW	0.7	2.9	3.9	2.6
Total Public Sector	83.5	42.7	45.7	50.9
Private pharmacy	4.6	13.4	15.9	13.9
Medical store	0.0	0.0	6.1	1.4
Private center/doctor	2.6	15.7	15.6	14.4
Traditional provider	0.0	0.0	2.1	0.0
Total Private Sector	7.2	29.1	39.7	29.7
Other	9.4	28.3	14.8	19.5

Source: PSI 2008.

private sector in December 2007 and, based on that assessment and the data provided above, designed a program to address the following conditions:

- ▶ Madagascar has no pharmaceutical manufacturing capacity to produce either zinc or ORS; therefore, these products would have to be imported.
- ▶ The commercial sector, while having a reasonably good wholesale distribution system, did not have a strong distributor who could independently import the products and market them nor adequate reach into rural areas.
- ▶ The primary source of advice and treatment for diarrhea was predominantly within the public sector thereby requiring a close public-private partnership for maximum impact.
- ▶ Since the political crisis that began in late January 2009, the public sector has rapidly dwindling resources to continue to supply zinc and ORS to its own clinics.

- ▶ Diarrhea care seeking and treating behavior in poor rural areas was limited, indicating the need for special attention and a subsidy to meet the needs of the poorer segments of society.
- ▶ ORS use has been historically low (8–12 percent according to recent data) and the new low-osmolarity ORS sachets have not been available in the market. The POUZN team felt that importing zinc and the new low-osmolarity ORS and co-packaging them would improve the use of both products and assure supply of ORS during the diarrhea season.

PROGRAM GOALS

The goals of the POUZN program in Madagascar were to decrease child morbidity and mortality by:

- ▶ **Increasing access** to pediatric zinc among caregivers of children under five in Madagascar, ensuring that a high-quality, affordable diarrhea treatment kit was available nationally through commercial

channels in private sector urban and peri-urban outlets and at a subsidized price for poor, rural households through community-based channels.

- ▶ **Improving caregiver knowledge and treatment** of childhood diarrhea so that caregivers provide ORS or a home-prepared sugar-salt solution (SSS) together with zinc as the first-line treatment for uncomplicated diarrhea.
- ▶ **Improving private provider knowledge and treatment** of childhood diarrhea so that providers promote pediatric zinc along with oral rehydration as the first-line treatment for uncomplicated diarrhea in under-five children.

TIMELINE

POUZN's private sector zinc program began in 2008. Initial efforts included community-based pilots in seven districts located in Vakinankaratra and Atsimo Andrefana regions as well as commercial distribution through pharmacies and other private sector outlets nationwide. Civil disturbance and the change of government in Madagascar in January 2009 severely hampered both public and private sector programs, delaying the POUZN program launch to April 2009 for its community-based distribution and to June 2009 for its commercial distribution program. Products were finally available for distribution by June 2009 but restrictions on advertising through government-owned media channels and diminished radio communication infrastructure further inhibited the program launch.

In August 2009, the POUZN program expanded to 45 districts in collaboration with USAID's bilateral SantéNet2 project and its Champion Commune Program as well as continued commercial distribution. Delays in receipt of a second order of ORS and packaging from the supplier delayed training of additional nongovernmental organization (NGO)-based sales agents and restricted the distribution of supplies of the community-based product into 2010.

MOHFP PUBLIC SECTOR DIARRHEA MANAGEMENT PROGRAM

The POUZN program is complemented by a public sector program in a majority of health districts throughout the country. Prior to the political crises in January 2009, which brought about a crisis in MOHFP leadership and staffing, the MOHFP had been moving forward with an aggressive plan to train their health clinic staff in the new standard management for childhood diarrhea using ORS and zinc. By 2010, they had reached half of the CSBs in 90 of the 111 health districts of Madagascar. UNICEF assisted in this process by both training CSB staff and CHW in 24 districts in community-IMCI that included zinc treatment and providing supplies of both zinc and ORS to the government for the 90 districts with trained CSB staff. USAID's maternal and child health project, BASICS, provided training in several districts as well as technical support to the MOHFP during their own CSB training efforts.

POUZN PROGRAM COMPONENTS

PRODUCTS

The POUZN project developed a two-pronged strategy to distribute and market two pre-packaged diarrhea treatment kits (DTK) containing the new low-osmolarity ORS, imported from India, and pediatric zinc sulfate tablets, imported from Nutriset/Rodaël in France.

ViaSûr: In April 2009, POUZN introduced a subsidized DTK, *ViaSûr*, that contains 10 20mg tablets of zinc sulfate, two sachets of orange-flavored ORS, and pictorial/Malagasy instructions for low-literacy target populations. This kit was made available exclusively through rural community-based sales agents, supervised by NGOs, for the subsidized price of 500 ariary (US\$0.25).⁵ Late arrival of DTK component products and packaging and the political crisis led to delays in launching the product during the 2008–09 diarrhea season, which primarily spans the period from late November through March of the following year.⁶

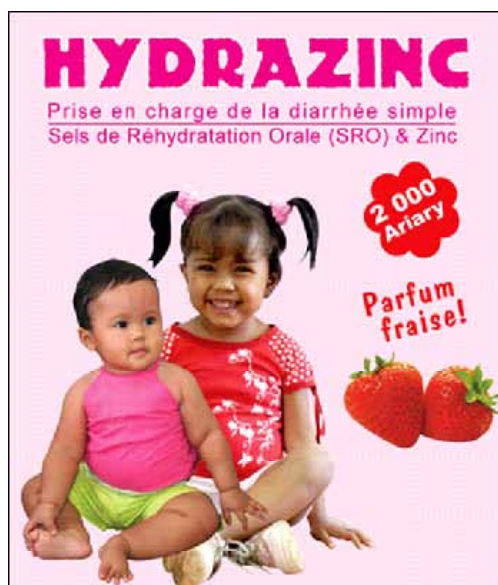


⁵ US\$1 = 2,000 ariary

⁶ Given the size and varying ecosystems found on Madagascar, there are some regional variations to this pattern.

The second order of ORS for the kit was similarly delayed, again severely limiting the supply of *ViaSûr* during the 2009–10 diarrhea season to the supply received the previous year.

HydraZinc: In June 2009, POUZN introduced its “premium” DTK, *HydraZinc*, containing the same 10 20mg zinc sulfate tablets, strawberry-flavored ORS, and pictorial/French instructions, and distributed it nationwide through the commercial pharmaceutical system for sale in pharmacies and rural drug counters known as *dépôts de médicaments (dépôts)* at a cost recovery price of 2,000–2,500 ariary (US\$1.00–1.25). *HydraZinc* was positioned as a more up-scale, premium product and is being promoted through mass media advertising.



MOHFP Products: As mentioned above, the MOHFP moved forward with an aggressive plan to train health clinic staff in the new standard management for childhood diarrhea using the new low-osmolarity ORS and zinc. As part of this plan, the MOHFP distributed unflavored ORS and the same 20mg blister packs of zinc from Nutriset in France, both supplied by UNICEF, to those CSB with trained staff.

PRICE

The cost to produce the DTKs for each distribution model is approximately US\$0.60–65. During the initial program design phase it was decided that one of the imported zinc treatment kits would be sold on a cost recovery basis through private commercial sector channels and the other would be sold at a subsidized price to rural families through a network of NGO-supported community distributors. Both price structures were based on both formative research and discussions with MOHFP. A summary of the retail pricing structure for both POUZN and MOHFP zinc/ORS treatment is provided in Table 3.

ViaSûr: The price for *ViaSûr* was determined in consultation with the MOHFP. Sixty-one percent of the population lives on less than US\$1/day. Ability to pay is lower in rural areas, where *ViaSûr* is distributed, than in urban areas. Given that the minimum cost to families seeking care in the public sector is 400 ariary for zinc and two sachets of ORS, the MOHFP requested that the POUZN team set the price for its subsidized product just above that of the two public sector products, thus 500 ariary for the kit.

HydraZinc: The POUZN team felt that it was important to offer a fully cost recoverable product through the commercial market to ensure that should funding for the subsidy no longer be available, diarrhea treatment products would be available on the market, and that scarce subsidy resources would benefit those most in need. This made it necessary to set a 2,000 ariary end user price for *HydraZinc*. Formative research found that caregivers spend between 1,000 and 7,200 ariary for diarrhea treatments, leading the POUZN team to believe that a 2,000 ariary product was affordable for the target population. The wholesaler and retailer margins set by PSI were standard in the industry: pharmaceutical wholesaler Farmad 8 percent, wholesaler 10 percent, and retailer 20 percent. However, during the first *HydraZinc* distribution phase, wholesalers increased their margins to 20 percent, resulting in some retailers selling the product for 2,500 ariary.

Public Sector: The public sector-supplied zinc sulfate is sold for a standard price of 300 ariary for the 10-tablet blister. The low-osmolality ORS is sold at a cost of 50 ariary for indigent patients and up to 270 ariary for other families.

TABLE 3. SUMMARY PRICING OF ZINC TREATMENT PRODUCTS

	Price for Zinc (10-tablet blister)	Price for ORS	Total Price (10-tablet blister plus 2 sachets)
Public sector subsidized	300 ariary	50/sachet	400 ariary
Public sector regular	300 ariary	270/sachet	840 ariary
POUZN subsidized (<i>ViaSûr</i>)			500 ariary
POUZN commercial (<i>HydraZinc</i>)			2000 ariary

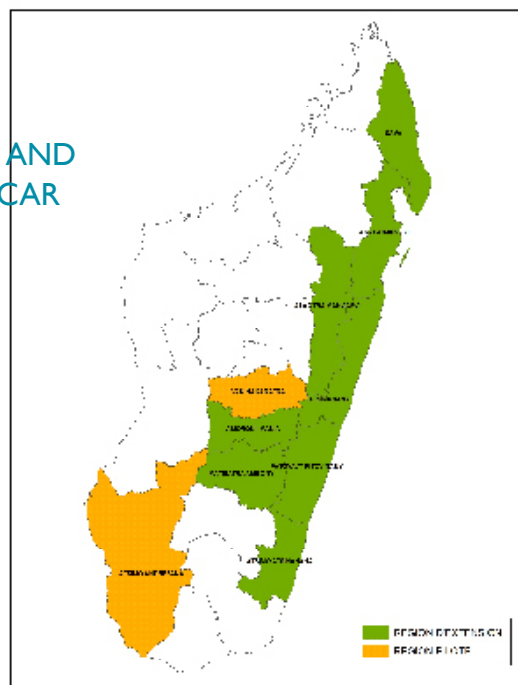
DISTRIBUTION

The POUZN team distributed ViaSûr exclusively through NGOs, leveraging their networks of community-based distributors (CBDs) who both promote use and sell a “basket” of child health products to households within their own rural communities. This distribution system ensures that the program reaches the poorest communities most vulnerable to diarrhea and provides income for the CBD. CBDs earn 100 ariary for each ViaSûr kit sold. The CBDs were selected, trained, and supervised by partner NGOs. This community-based distribution program was centered in 225 communes with high rates of diarrheal disease located in 45 districts that are active in the USAID’s bilateral SantéNet2 “Champion Community” program. In this program communities set health goals and are rewarded when those goals are reached. The community-based program also included a number of other NGOs outside of the SantéNet2 partners in order to extend the reach of the product as far as possible into other rural communities. The accompanying map (Figure

1) illustrates POUZN program areas. Primary international partner NGOs include Medical Care Development International (MCDI), Catholic Relief Services (CRS), and CARE International. Local NGO partners (those with smaller reach and operating outside of the SantéNet2 program) included Population and Environmental Services (PENSER); Action Socio-Sanitaire Organisation Secours (ASOS), a local NGO focusing on health population and environmental issues; Voahary Salama, a consortium of conservation, health, and rural development partners from five biodiverse regions of Madagascar; SALFA, a faith-based NGO that operates health clinics in rural areas and implements community-level health activities; GOLD, a local NGO with a number of health education activities in the Betafo district; and Mercy Ministries, a faith-based organization that supports health huts in many inaccessible and rural areas.

HydraZinc: PSI Madagascar distributes 13 products in all of the country’s 111 health districts through the pharmaceutical wholesaler, Farmad, and regional wholesalers. Since June 2009, HydraZinc has been

FIGURE 1: MAP OF POUZN PHASE I AND PHASE II PROGRAMS IN MADAGASCAR



distributed to private sector retail points through this system. Supporting this distribution, PSI's team of nine medical doctors (detailers) visit pharmacists and dépôts to supply product samples and provide point-of-purchase promotional and educational materials. As of 2010, the distribution network included 893 registered pharmacies and dépôts and 377 private dispensaries, each of which stocked PSI products. Using these nationwide pharmaceutical wholesale and retailer networks, HydraZinc was made widely available in urban areas of Madagascar, reaching 95 percent of the country's pharmacies.

PROMOTION

Communication efforts targeted both caregivers of children under five and the providers who recommend those products (pharmacists, doctors, and CBDs). Formative research indicated that caregivers sought care first from providers who then recommended treatment. In order to meet the communication objectives, two separate messages were developed: one to educate providers (both doctors and pharmacists) about the new protocol and convince them that zinc was as effective as the antibiotics or anti-diarrheals that they had previously recommended, and the second to introduce the new treatment to caregivers and suggest that they visit their provider for a prescription.

ViaSûr: Given that only half of rural families have access to news media through radio, interpersonal communication by CBDs was one of the primary communication vehicles for ViaSûr. The POUZN team developed a counseling card/treatment guide (algorithms for treating diarrhea, respiratory infections, and malaria) to assist in this process. ViaSûr

was not advertised via mass media to avoid encouraging consumers who could afford HydraZinc at the commercial price to purchase the subsidized ViaSûr. Key messages covered how to prepare/administer each product, emphasizing the need to use zinc and ORS together and to complete the full 10-day regime of zinc, the importance of increasing fluids and feeding during diarrhea, prevention and danger signs that necessitate referral to trained medical personnel – all of which enhance the caregiver's ability to effectively manage episodes of uncomplicated diarrhea. Interpersonal communication was supplemented by four mobile video unit teams that circulated through rural areas with messages focused on water treatment improved hygiene practices and diarrhea treatment. These teams circulated through project areas on a semi-annual cycle with a single set of messages presented during each visit.

HydraZinc: A mass media campaign commenced in April 2010⁷ with both radio and television spots broadcast on four government-owned national and regional television and radio channels as well as three private television channels in Antananarivo and four privately owned regional radio and television channels. Sales have increased considerably since television advertising began. Other communication materials for HydraZinc focused on point of sale promotional materials. Detailing and promotion also took place with medical doctors and pharmacists, encouraging them to include HydraZinc in prescriptions for diarrhea treatment. A prescription pad and other promotional items were produced

⁷ Given the political situation, USAID requested that the project maintain a low profile. This severely inhibited the introduction of HydraZinc, which needed mass media advertising to create product awareness and promote sales. This ban was lifted in December 2009.

for use by private providers, pharmacy, and dépôts staff. In the absence of mass media promotion during the first several months of HydraZinc availability, mini-launches with regional units of the Madagascar Medical Association were conducted to create demand for the products. No formal training of providers or pharmacists took place.

EVALUATION RESULTS

In February–March 2010, POUZN conducted an end-of-project household survey, qualitative research, and a mystery client survey to examine differences in diarrhea treatment practices, message recall, perceptions, and knowledge associated with various models of distribution by comparing four POUZN-supported districts, two BASICS/UNICEF-support districts, two MOHFP target districts, and two control districts where zinc was not available in the public sector. The results of this research are provided below.

DIARRHEA TREATMENT PRACTICES

The survey found that for diarrhea, the majority of caregivers (80 percent) provided a (non-recommended) home fluid or increased fluids, while only 21 percent treated with ORS and/or SSS. In addition, 40 percent of caregivers treated with an antibiotic,⁸ 6 percent with an anti-diarrheal, 23 percent with another (unidentified) pill or syrup, and 19 percent used a home remedy or traditional medicine. While 84 percent of caregivers provided some treatment to the child, only 45 percent sought diarrhea advice or treatment outside the home. Of those who did not treat, 59 percent stated that the child was not very sick, 13 percent could not afford to

⁸ Only 19 percent of children treated with antibiotics reported having blood in the stool.

treat, and 12 percent were afraid the child was too young to be given drugs to treat diarrhea. These findings were confirmed in interviews with caregivers in the 10 surveyed districts who reported that home remedies were the preferred treatment for diarrhea. If care outside the home was required, then an antibiotic or injection was the preferred treatment. Few had any knowledge of zinc or of the DTKs.

ORS use was also low overall, reflecting both the low knowledge about ORS and the propensity for caregivers to prepare home solutions to reduce the cost burden of treatment. As stated above, the majority of caregivers gave their child home-prepared fluids rather than ORS. This finding was confirmed in virtually all focus group discussions with caregivers. Few mothers stated that they used ORS and most could not name an ORS brand nor had ever used ORS. Caregivers preferred herbal teas over ORS or homemade SSSs.

USE OF ZINC FOR DIARRHEA TREATMENT

By the end of the 2009–10 diarrhea season in March 2010, zinc use⁹ in the sampled districts was low, ranging from 2–3 percent in the POUZN and control districts to 12 percent in the MOHFP districts. The low use in POUZN-supported districts was not unexpected, given the program delays caused by the political situation, delays in receipt of ORS supplies during both diarrhea seasons, and restrictions on advertising via national television and radio channels. Use rates were highest in MOHFP-supported districts that had trained staff and sufficient supplies of both

⁹ Zinc use refers to proportion of children aged 6–59 months with diarrhea in the 2 weeks (n=1000 in household survey) preceding the survey who were treated with zinc.

ORS and zinc. At the time of the survey, the ViaSûr kits were not yet extensively available in the target rural communities or rural dépôts although HydraZinc was reportedly available in 90–95 percent of pharmacies. Very few caregivers (3 percent) in all surveyed districts reported that they were advised to use zinc when they sought advice outside of the home. Among those children who were treated with zinc, 82 percent were also correctly given ORS or SSS (Table 4). However, only 29 percent were treated correctly with zinc for the full 10 days.

IMPROVING ACCESS TO ZINC THROUGH BOTH PRIVATE AND PUBLIC SECTORS

POUZN research findings confirm that the public sector CSBs in Madagascar play an important role in providing pediatric diarrhea advice and treatment. The primary sources of advice or treatment outside of the home for pediatric diarrhea, even with the political crisis, were still CSBs (34 percent), followed by friends/neighbors/relatives (23 percent), private providers (17 percent), and private pharmacies/dispensaries/dépôts (14 percent). Fewer than 6 percent of caregivers mentioned that they sought advice from a CHW or CBD.

The public sector was the major source of zinc: 69 percent of zinc users obtained zinc supplies from CSBs or their associated CHWs and 31 percent obtained zinc from private sector sources (pharmacy, dépôt, private clinic, or CBD). Of those who purchased zinc from private sector sources, 31 percent purchased zinc from a pharmacy or depot, 33 percent from a private doctor or nurse, and 34 percent from a CBD. The primary reasons given for choice of CSB as provider of zinc were quality of care (74 percent), most knowledgeable (72 percent), and the only place available (67 percent). Community health workers were mentioned as having the best price (47 percent) and being easily accessible (39 percent). Pharmacies were mentioned as having high-quality products.

TABLE 4. DIARRHEA TREATMENT USING ZINC AMONG CHILDREN UNDER FIVE

	Among children with diarrhea (%)	Among zinc users (%)
Treated with zinc	4.8	--
Treated with zinc plus ORS and/or SSS	4.7	82.4
Given zinc for 10 days or more*	1.2	29.3
Treated with zinc for 10 days or more plus ORS/SSS*	1.2	23.8
Total number of children	1,000	48

* Excludes those who had not taken zinc for the full 10 days because the child still had diarrhea.

PRICING

Zinc and ORS are not free in the public sector; clients pay from 400 ariary for indigent clients to as high as 840 ariary for all other clients. (Districts differ in the price charged, particularly for ORS; 270 ariary per sachet was the most often mentioned price for ORS at CSB pharmacies.) In qualitative interviews with both caregivers and public sector providers, poverty was frequently mentioned as a constraint to both seeking care and purchasing a diarrhea treatment. Among those who purchased zinc, 38 percent thought it was affordable and 28 percent thought the products were expensive. The survey did not collect data to determine if price was a barrier to purchase. All of the caregivers who had ever used zinc said they would purchase and use it again.

IMPACT OF MASS MEDIA ON AWARENESS AND USE OF ZINC

Few caregivers reported having heard of zinc or one of the DTKs in the month preceding the survey. This was not surprising due to program delays and restrictions on broadcasting messages. The POUZN-funded household survey showed that only 23 percent of caregivers of children under five years had heard any message on diarrhea treatment over the past three months; only 8 percent had heard about ORS in the past three months; and just 2 percent had heard about zinc in general or a specific branded message about ViaSûr or HydraZinc in the past month. Of the few who had heard about zinc, 76 percent knew that zinc was an appropriate treatment for diarrhea, 29 percent knew that zinc would reduce the duration of diarrhea, 15 percent knew that zinc would reduce severity; 35 percent knew they could obtain zinc from a CSB and 39 percent mentioned a pharmacy. Among

caregivers who had heard a message about ORS (8 percent), over 53 percent knew that ORS replaced liquids lost during the bout of diarrhea and 74 percent had used ORS in the past to treat a child with diarrhea as opposed to only 16 percent of those who had not heard a message.

While only 35 respondents had heard a message about zinc or specifically about ViaSûr or HydraZinc, it is encouraging to note that 50 percent could recall the message that zinc is an appropriate treatment for diarrhea, 34 percent recalled that zinc reduced the duration and 24 percent recalled that zinc reduced the severity of diarrhea. Fewer recalled that zinc should be taken with ORS (13 percent) or for the full 10 days (15 percent) indicating that messages on correct use need to be improved.

IMPROVING PROVIDER KNOWLEDGE AND PRACTICE

Both the household and mystery client surveys indicated that use of antibiotics, anti-diarrheals and other pills/syrups is high (Table 5). Caregivers were as likely to obtain an antibiotic from a public sector as from a private sector source, while they were more likely to obtain an anti-diarrheal from a private pharmacy or provider. Unidentified pills or syrups were most often obtained from a CSB.

Among caregivers in the household survey who sought diarrhea advice or treatment at CSBs, 25 percent said that they were advised to give an antibiotic and 41 percent were advised to give an anti-diarrheal. Even though both public and private sector providers had been informed of the new protocols, including zinc, some providers continue to recommend antibiotics

TABLE 5. SOURCE OF SUPPLY OF ANTIBIOTICS, ANTI-DIARRHEALS, ZINC, AND OTHER UNKNOWN PILLS OR SYRUPS REPORTED BY CAREGIVERS WHO USED THESE PRODUCTS FOR PEDIATRIC DIARRHEA TREATMENT IN THE TWO WEEKS PRIOR TO THE HOUSEHOLD SURVEY

	Antibiotics	Anti-diarrheals	Zinc	Other pills or syrups
CSB (public)	32.5	30.1	55.1	36.0
Private doctor/midwife/nurse	13.7	18.3	9.9	7.8
CHW/CBD	2.8	4.0	23.9	2.8
Pharmacy/depot/dispensary	21.6	36.1	9.1	19.5
Relative/neighbor/friend	2.9	2.7	0.0	3.5
Other	26.6	8.9	2.0	30.5
Total	400	40	48	221

and anti-diarrheals for the treatment of uncomplicated diarrhea. In the mystery client survey, of 61 private pharmacists and dépôt staff surveyed, 46 percent prescribed an antibiotic,¹⁰ 33 percent prescribed an anti-diarrheal, and only three of the 61 vendors (5 percent) prescribed zinc with ORS. Out of the 56 vendors who were then explicitly asked about zinc, 22 (or 36 percent) said they never heard about zinc nor knew anything about the product. Eight out of the 56 vendors (14 percent) said that zinc was either out of stock or was never sold in their pharmacies.

In-depth interviews with over 30 CSB doctors confirmed that doctors are very comfortable with antibiotics. A physician working in a CSB who had been trained on zinc reported: “We use zinc...if there is a big quantity of water loss; we give ORS, three sachets to be taken during three days...then a bit of antibiotics to help like amoxicillin, for example.” A CSB doctor from a control area where zinc was not available stated: “We may offer charcoal tablets and metronidazole, and then ORS.” Later he stated: “What I find to be most

efficient for diarrhea is a treatment with antibiotics; for instance chlormphenicol, metronidazole accompanied by charcoal tablets and medicine against spasms. That treatment is very efficient.... If I treat an infant for diarrhea and the child receives those medications, four hours after taking the medicines the diarrhea stops.”

Not only are doctors very accustomed to prescribing antibiotics or anti-diarrheals, either instead of or along with zinc and ORS, caregivers are also very familiar and comfortable with a range of these products, which they have used in the past, and may mistake a zinc blister for an antibiotic (or simply as a medication prescribed for the child’s diarrhea).

Even CBDs/CHWs believe that antibiotics are the treatment of choice as illustrated by the following statement from a focus group discussion with these agents: “we lack medicines; some medicines are missing in our stock... but only ViaSûr and ACT [artemisinin-based combination therapy (for malaria)] make up our supply, thus we lack the most useful medicines, especially for rural people who need paracetamol and cotrimoxizole and metronidazole the

¹⁰ These were all presented as simple cases of uncomplicated diarrhea that would not have required antibiotic treatment

most.” Essentially they believe that they do not have the most effective drugs. They are simply selling and recommending ViaSûr and ACT because that is what they have.

CONCLUSIONS

The POUZN program in Madagascar has been hampered by delays in program preparation, ordering and receipt of product components, and dissemination of messages to promote both brand recognition and awareness of zinc as a recommended diarrhea treatment. The greatest impediment to program progress has been the political crisis that began in January 2009 and continues to the present day. The crisis delayed receipt of the first delivery of both zinc and ORS and inhibited airing of promotional messages through mass media, thus hampering sales of HydraZinc through commercial outlets.

Despite the political crisis, POUZN-supported research confirms the importance of the public sector as a source of both diarrhea treatment advice and zinc. Thirty-four percent of caregivers sought advice or treatment for their child from the public sector and 55 percent of zinc users obtained zinc from a CSB. Among the five different types of districts examined, zinc use rates were highest in MOHFP districts, which had trained staff and zinc supplies.

POUZN put considerable effort into increasing knowledge and use through the interpersonal communication of trained CBDs. The majority of respondents (73 percent) in POUZN districts, where training had been completed and ViaSûr supplies were available, obtained zinc from CBDs. This is an encouraging sign that there is

potential for POUZN to make an impact on diarrhea management practices in the future, when training has been completed and all trained CBDs have adequate supplies of ViaSûr.

Another encouraging finding was that most of the zinc users reported that they also used ORS/SSS with the zinc, as recommended. ORS/SSS use is critical to address the dehydration that accompanies diarrhea. However, more effort will be needed to increase adherence to the 10-day zinc protocol.

Finally, it should be noted that a relatively high proportion of caregivers reported that they gave antibiotics or other unknown pills/syrups for their child’s most recent episode of diarrhea, and that they obtained them from both public and private providers. The mystery client survey in turn showed a large proportion of vendors prescribing these products, suggesting a need to continue educating providers about appropriate diarrhea case management. Furthermore, qualitative research confirmed that



antibiotics and anti-diarrheal treatments are well known and trusted methods of treatment for caregivers, thus indicating the need for greater efforts at educating both caregivers and providers on the advantages of zinc over these commonly used treatments.

LESSONS LEARNED

In countries where the public sector is the primary source of care, priority should be given to strengthening the public sector's ability to deliver zinc and ORS. Both quantitative and qualitative research data in Madagascar indicated that the majority of caregivers seek advice and treatment from the public sector and consider doctors at the CSB as important sources of health information. In countries with high rates of public sector use, it may be difficult to achieve high zinc use through a private sector program alone.

Two critical elements for achieving higher zinc use rates are trained staff and available product. Zinc use rates were highest in MOHFP districts where these conditions were met. Similarly, in the POUZN districts with trained CBDs and adequate product, 73 percent of zinc users obtained those supplies from a trained CBD.

Despite low ORS use overall, most zinc users in the survey also used ORS/SSS, leading one to believe that packaging ORS with the zinc in traditionally

low ORS use areas may be an appropriate approach to increasing overall ORS use rates.

Compliance with the 10-day protocol for administration of zinc continues to be a challenge. While the use of zinc with ORS/SSS was very positive, less than one-third (29 percent) of zinc users used the zinc for the recommended 10 days. Future communications efforts need to reinforce the importance of taking zinc for the full 10 days.

Mass communications is critical to increasing knowledge of zinc as an appropriate diarrhea treatment and encouraging use. While very few respondents had heard either a generic message about zinc or a specific branded message about ViaSûr or HydraZinc, those individuals who heard either a generic or branded message were much more likely to have used zinc than those who had not heard the messages. Individuals who had heard a



message about zinc, ViaSûr, or HydraZinc were also significantly more likely to know that zinc was an appropriate treatment for diarrhea and that it reduced the severity and duration of diarrhea. As soon as the television advertising began in April 2010, sales of HydraZinc increased significantly.

Changing the behaviors of providers has proven to be one of the major challenges of zinc program implementation. Despite training and detailing, providers continue to recommend or prescribe antibiotics and anti-diarrheals instead of zinc for diarrhea treatment. This is true for both public and private sector providers, indicating that perhaps ingrained habits more than pricing margins drive this behavior.

Changing the knowledge base and behavior of caregivers may prove equally daunting. Initiating zinc programs in populations with low levels of education and limited financial resources, where caregivers tend to treat at home using herbal remedies or with well-known but inappropriate medicines, requires considerable effort to educate that public and expand knowledge on appropriate treatments prior to looking for a significant increase in zinc use.

ACKNOWLEDGMENTS

This report was authored by Vicki MacDonald and Dr. Kathryn Banke of Abt Associates. The authors would especially like to acknowledge the significant contribution of the Population Services International team in Madagascar, led by Brian McKenna, PSI Country Director; Olivier LeTouzé, PSI MCH Director; and Noelimanjaka Ramalanjaona POUZN Program Director; and the analytical expertise of Marianne El-Khoury of Abt Associates. They would also like to thank Dr. Benjamin Andriamitantsoa from USAID for his support throughout implementation of this program. This issue was designed and produced by Maria Claudia De Valdenebro, Abt Associates Inc.

RECOMMENDED CITATION

MacDonald, V. and K. Banke, October 2010. *Assuring Access to Pediatric Zinc for Diarrhea Treatment Through the Private Sector in Madagascar: Results and Lessons Learned*. Bethesda, MD, USA: Social Marketing Plus for Diarrheal Disease Control: Point-of-Use Water Disinfection and Zinc Treatment (POUZN) Project, Abt Associates Inc. and Population Services International.

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ABOUT POUZN

Social Marketing Plus for Diarrheal Disease Control: Point-of-Use Water Disinfection and Zinc Treatment (POUZN) Project

Contract No. GPO-I-00-04-00007-05

POUZN is led by Abt Associates Inc. in collaboration with Population Services International

For more information about POUZN or current publications (available for download) please contact:
POUZN
Abt Associates Inc.
4550 Montgomery Avenue,
Suite 800 North
Bethesda, MD 20814 USA
Tel: 301.347.5000
Fax: 301.913.9061
<http://www.pouzn.com>

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October 2010