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Scale Up of Zinc Sulfate Use through the Private Sector in Kenya

Assessment and Feasibility Study

Abt Associates



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Acronyms

APHIA	AIDS, Population, Health Integrated Assistance Plus Project
CDC	U.S. Centers for Disease Control and Prevention
CHAK	Christian Health Association of Kenya
CHERG	Child Health Epidemiology Resource Group
CHW	Community Health Worker
EML	Essential Medicines List
FBO	Faith-based organization
GoK	Government of Kenya
KDHS	Kenya Demographic and Health Survey
KEC-CS	Kenya Episcopal Conference-Catholic Secretariat
KEMSA	Kenya Essential Medicines Supply Agency
KFA	Kenya Health Federation
MCHIP	Maternal and Child Health Integrated Program
MEDS	Mission Essential Drugs Supply
MoMS	Ministry of Medical Services
MoPHS	Ministry of Public Health and Sanitation
NGO	Nongovernmental organization
ORS	Oral rehydration salts/solution
PPB	Pharmaceutical and Poisons Board
SHOPS	Strengthening Health Outcomes through the Private Sector
SUPKEM	Supreme Council of Kenyan Muslims
UNICEF	United Nations Children's Education Fund
USAID	U.S. Agency for International Development
WHO	World Health Organization

I. Introduction and Executive Summary

The USAID Mission to Kenya invited the Strengthening Health Outcomes through the Private Sector (SHOPS) project, implemented by Abt Associates, to conduct a whole market assessment of diarrhea management practices in April 2011. In particular, the assessment focused on identifying opportunities to increase access to and use of diarrhea treatment products (zinc and oral rehydration salts (ORS)) by caregivers of children under five through private sector channels. Major findings include:

- Updated diarrhea treatment policies and guidelines on the use of zinc sulfate (zinc) along with ORS are in place, though zinc is currently registered as a level two pharmacy only drug hence it is available over-the-counter at pharmacies, chemist shops, and in health facilities.
- Although zinc has been available in public sector facilities since 2008, the Government of Kenya (GoK) procures only about half of the annual need of public sector facilities.
- Kenya has a vibrant pharmaceutical sector with the capacity to both locally manufacture and import quality zinc formulations to meet total market demand.
- Very little training has been done of public sector providers on the new diarrhea treatment protocols. There has also been very limited training of private sector providers, chemists, pharmacy technicians or chemist counter staff on the new diarrhea treatment protocols. Thus, awareness of zinc and adoption of new treatment protocols is low within the public and private sectors.
- There have been limited demand creation efforts focusing on the mothers of children under five years of age or health providers. This has impacted demand for zinc in both public and private sectors facilities.
- Given the low demand and relatively low margins, importers and manufacturers of zinc have invested very little in demand creation.

II. Recommendations

A. Public Sector Strengthening

- Continue to advocate for the reclassification of zinc to level one status so that zinc can be made available to administer/dispense in the community and through fast moving consumer goods outlets.
- Ensure USAID-funded projects (especially APHIA Plus) and other partners support public sector dissemination of policies, guidelines and tools as well as training of service providers on diarrhea management at health center, dispensary and community levels.

B. Partnership with the Private Sector

- Develop and implement a generic social and behavior change communications campaign based on formative research promoting use of ORS and zinc (both mass

media and IPC/below the line promotion) to increase awareness about the effectiveness of zinc with ORS and encourage sustained use. Both caregivers and providers need to know that zinc with ORS is now the recommended treatment for childhood diarrhea.

- Cultivate champions among opinion leaders at senior levels of government, academia and/or within the medical profession who will advocate for improved diarrhea case management.
- Develop and implement a program to increase the knowledge and skills of providers and key opinion leaders at multiple levels throughout the country: academia, institutions, and professional associations through seminars, sensitization session and continuing medical education opportunities.
- Develop cost-share partnerships with importers and manufacturers to further catalyze brand promotion activities.
- Provide technical assistance to local manufacturers interested in producing zinc through USAID's agreement with U.S. Pharmacopeia.
- The Ministry of Medical Services has a nascent Public Private Partnership unit with whom a public private partnership relating to zinc could be established. The development of a zinc-related PPP between government and the commercial sector would provide an excellent opportunity for the PPP unit to better understand how such a partnership can benefit both parties and leverage this to increase uptake of zinc with ORS.

III. Background

A. Demographic Information

The estimated population of Kenya in 2010 was approximately 41 million, with 22% of the population living in urban areas and 78% in rural areas. Of the urban population, 90% have access to improved sources of water supply: 76% have access to piped water and 6% have access to water from tube wells/boreholes/hand pumps. In rural areas, 53% of the population has access to improved sources of water. Table 1 provides a set of basic demographic and health indicators relevant to diarrhea prevention and control in Kenya.

Table 1: Country Data and Health Indicators^{1, 2}

Population (2010 estimated)	41,071,000
Population Growth Rate	2.8%
% Urban vs. rural	22/78%
GNI per capita (PPP)	\$770
Literacy rate	85%
Life expectancy	59 years
Infant Mortality Rate (IMR)	52/1000

¹ Kenya National Bureau of Statistics and ICF Macro. 2010. *2008–09 Kenya Demographic and Health Survey: Key Findings*. Calverton, Maryland, USA: KNBS and ICF Macro.; UNICEF Basic Statistics

² CIA World Factbook, 2010.

Child Mortality Rate (< 5 MR)	74/1000
Maternal Mortality Ratio (2005, adjusted)	488/100,000
% Children under five with diarrhea in preceding 2 weeks	16.6%
% Households (HH) with access to improved drinking water sources (UNICEF/World Bank definition)	90% urban, 54% rural
% HH with piped water in home	23% urban, 5% rural
% HH with no toilet or latrine (“nature”)	12%
% HH with flush toilets or VIP (ventilated/improved pit) latrines	15%

B. Health Sector and Management of Diarrheal Disease

According to the 2008-2009 Kenya Demographic and Health Survey (KDHS), the under-five mortality rate in Kenya is 74 per 1,000 live births. The 2010 Lancet article on causes of child mortality reported that the leading causes of mortality among children under five in Kenya are neonatal related causes (27%), diarrheal diseases (20%), acute respiratory infection (16%), malaria (11%), and other infectious diseases (15%).³

C. Prevalence of Diarrheal Disease

Diarrhea prevalence, according to the KDHS, was 16.6 % for all children under five with 29.9% prevalence among children in the 6-11 month age range, and 27.8% among children 12-23 months. These relatively high levels of diarrhea prevalence have remained fairly constant from 2003 to 2008. Diarrhea prevalence rates are comparable for urban and rural residents, as indicated below in Table 2, with slight variation among those with improved (15.4%) versus unimproved (18.2%) water sources and those with improved (14.1%) or unimproved/shared (17.1%) toilet facilities. Prevalence does not vary widely by region with the exception of Coast Province which has a high (27.2%) prevalence rate. Western and Nyanza Provinces have higher than average diarrhea prevalence rates and are both high need zones in terms of child health and child mortality mitigation interventions. According to WHO/CHERG⁴ 20% of child deaths in Kenya in 2008 were attributed to diarrhea (or approximately 38,800 deaths).⁵

Table 2. Diarrheal Prevalence in Last 2 Weeks (KDHS 2008)

		Diarrheal Prevalence, Children Under 5
Type of Residence	Urban	16.8
	Rural	16.5
Province	Nairobi	11.9
	Central	14.4

³ Global, regional, and national causes of child mortality in 2008: a systematic analysis. *The Lancet* (online), 12 May 2010. Robert E Black, Simon Cousens, Hope L Johnson, Joy E Lawn, Igor Rudan, Diego G Bassani, Prabhat Jha, Harry Campbell, Christa Fischer Walker, Richard Cibulskis, Thomas Eisele, Li Liu, Colin Mathers, for the Child Health Epidemiology Reference Group of WHO and UNICEF

⁴ WHO Child Health Epidemiology Reference Group (CHERG) 2010 accessed at www.cherg.org.

⁵ Lancet 2010.

	Coast	27.2
	Eastern	14.9
	Nyanza	16.2
	Rift Valley	15.9
	Western	17.2
	North Eastern	16.0
National Total		16.6

Diarrhea incidence is common in some of the rural areas where families are using untreated borehole water. Cases of diarrhea have a seasonal pattern with large numbers being reported during the rainy seasons, and also during dry spells especially among pastoral communities due to the practice of collecting water from water pans shared with livestock as the water sources become a challenge.

Table 3 summarizes the findings of the 2008/2009 KDHS regarding the treatment of diarrhea in Kenya. About half of the children were taken to a health provider during the reported bout of diarrhea. Urban/rural differences in treatment regimen used are minor, although a greater proportion of urban dwellers provided more fluids and rural respondents were more likely to have used an anti-motility drug. Of all children under five, 39% were given oral rehydration salts (ORS) from a packet, 51% were given a recommended home fluid, and 72% were given ORS, recommended home fluids or more fluids than usual. Fourteen percent were given an antibiotic and 9% were given an anti-motility drug.

Table 3. Treatment of Diarrhea in Children

	Health Provider	ORS Packet	RHS	ORS or RHS	More Fluids	Antibiotic	Anti-motility drugs	Home Remedy-other	No treatment
Urban	48.3	40.3	51.9	71.5	38.1	15.3	5.6	27.1	11.8
Rural	48.7	38.5	50.1	71.5	23.3	13.9	9.4	23.9	13.2
Total	48.6	38.8	50.5	71.5	26.1	14.2	8.7	24.5	13.0

Source: 2008-09 KDHS

D. Care seeking behaviors

Secondary analyses of KDHS 2008/2009 data targeted at care seeking behaviors, indicates about 40% of children with diarrhea were treated at home or received no treatment, 37% of diarrhea cases were treated in the public sector, 18% in the private sector, and 5% sought care from other sources (primarily traditional providers). These results are presented in a series of graphs below. According to this analysis, there are some interesting differences between care seeking behaviors among rural versus urban households as highlighted in Figures 1-4 below. While the majority of households in rural areas seek diarrheal treatment primarily in the public sector health facilities, the public/private split in urban areas is about 50/50. Further detailed analysis of the KDHS data indicates that those who sought care from private sector sources in rural areas visited hospitals, pharmacies, informal sector shops, and traditional healers. In urban areas,

those seeking care from private sector sources do so primarily from hospitals, pharmacies, and shops.

Figures 1 to 4

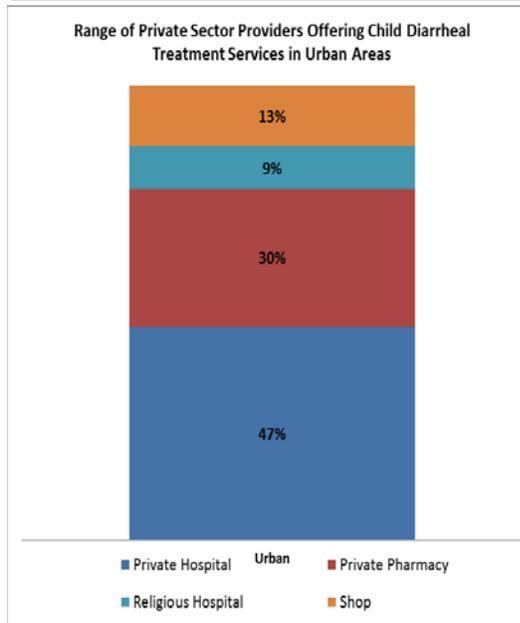
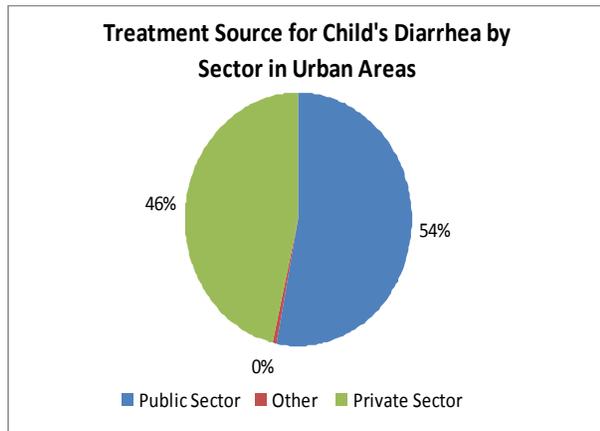
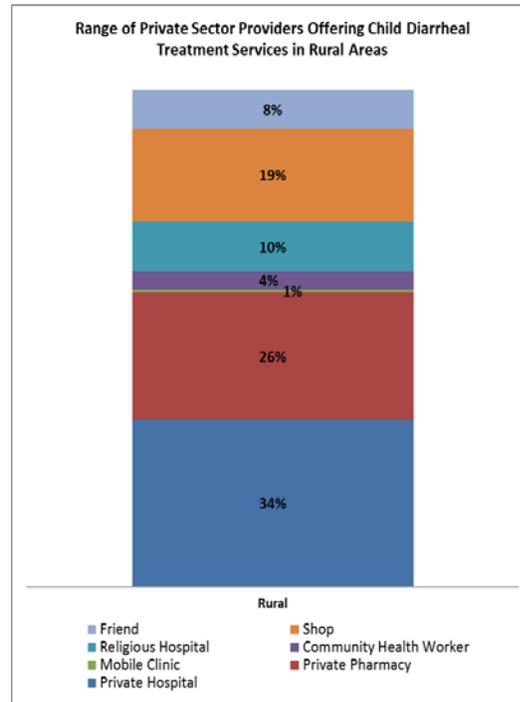
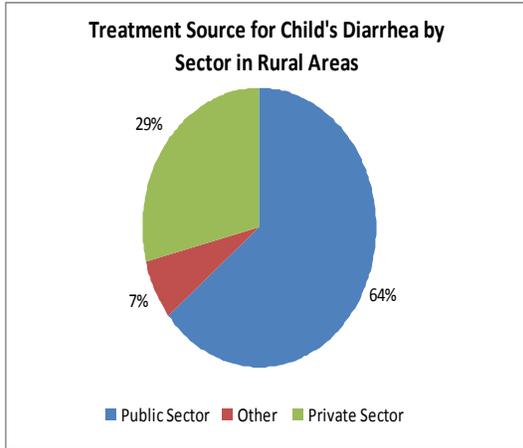
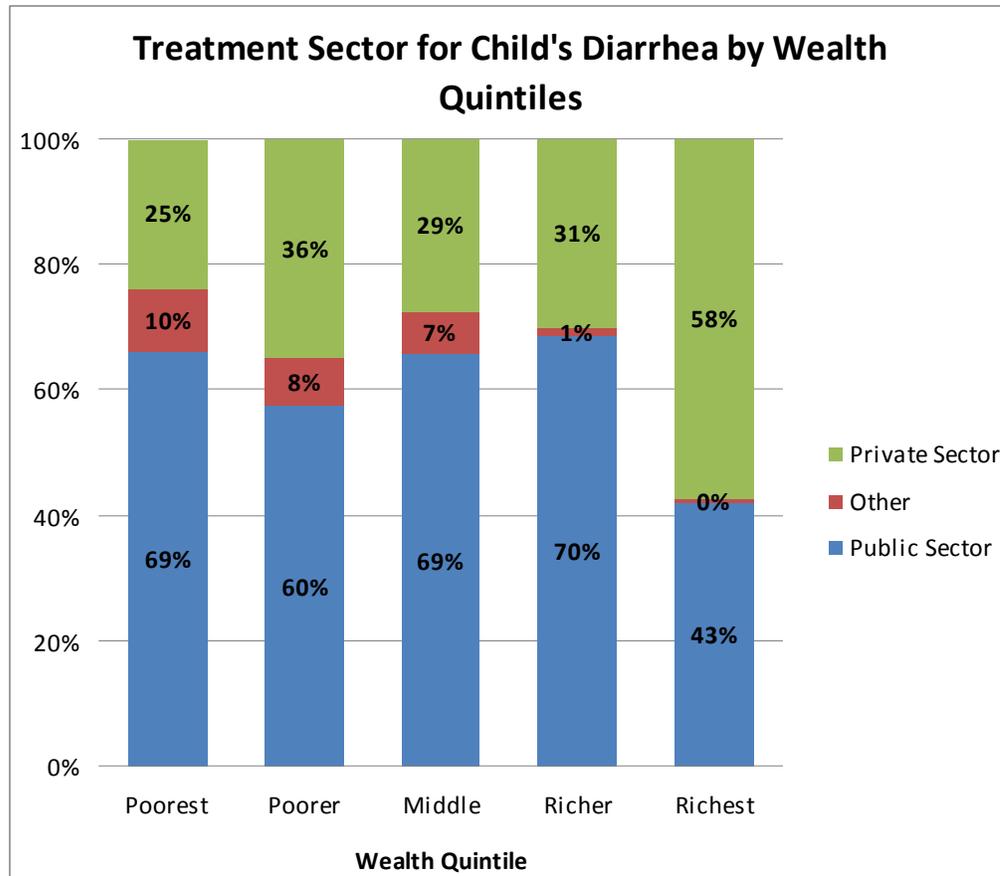


Figure 5 below indicates by wealth quintile the range of service providers used during bouts of diarrhea. It is clear from the data that even the poorest segments of the society seek diarrhea treatment care from private sector sources and primarily from hospitals and pharmacies, although informal sector shops and community health workers are a key source of care. Among the two richest quintiles, hospitals and pharmacies provide about 76% of all diarrhea care.

Figure 5. Diarrhea treatment care seeking behavior by wealth quintile in Kenya



Diarrhea treatment patterns are presented in Table 4 below by place of treatment. ORS use is high regardless of public or private source of treatment. Many prescriptions are issued for unidentified pills and syrups from private providers and “multiple” sources but also from public facilities and private pharmacies. Data indicates that anti-diarrheal treatments are provided by private pharmacies while public sector facilities are more likely to recommend antibiotics. The data points to the critical need to work with private providers, and private pharmacies in particular to change their knowledge, attitudes and practices related to the treatment of diarrhea among children under five.

Table 4. Kenya (2008 DHS) Diarrhea Treatment Practices, by source⁶

Place sought treatment/advice	Types of treatments used (multiple responses allowed)								
	ORS	Anti-biotics	Anti-diarrheals	Zinc	Other pills/syrups	Injections	IV	Home remedies/herbs	Other
Nowhere/treated at home (39.2%)	52.0	3.8	5.2	0.0	5.7	0.0	0.0	5.6	2.3
Public sector (35.7%)	87.8	22.4	9.4	0.3	24.7	8.3	0.4	3.0	0.1
Pharmacies (private) (7.6%)	78.5	12.8	19.7	0.0	28.1	6.6	0.0	2.1	5.0
Private sector providers (10.7%)	81.1	17.4	7.6	1.4	45.9	12.2	0.4	2.6	0.0
Traditional Practitioners (2.0%)	76.2	10.8	0.0	0.0	2.6	8.5	0.0	38.7	3.5
Other* (2.6%)	64.1	5.0	13.8	0.0	18.7	0.0	0.0	14.9	0.0
Multiple sources** (2.2%)	96.7	33.6	17.4	0.0	33.9	25.1	0.0	25.2	0.0
TOTAL (100%)	71.1	12.7	8.1	0.3	19.0	4.8	0.2	4.7	1.4

*Other includes mobile clinics, community health workers, and relatives/friends

**Multiple sources: n=23 respondents cited 2 or 3 sources of treatment/advice and are included in this category

E. Policy Environment

In Kenya there are two Ministries of Health that oversee health programs. The Ministry of Medical Services (MoMS) oversees overall policy and governance issues, as well as tertiary or hospital service facilities, while the Ministry of Public Health and Sanitation (MoPHS) is responsible for delivery of health services at the primary level (health centers, dispensaries and community facilities).

In 2009, the two ministries updated the clinical guidelines for the management and referral of common conditions. Low-osmolarity ORS and zinc sulfate were included in these clinical guidelines for treatment of diarrheas at health facilities and hospitals; however, the guidelines for management of diarrhea at the community level mention only use of ORS. In March 2010, MoPHS and its Division of Child and Adolescent Health released new policy guidelines on the control and management of diarrheal diseases in children below five years in Kenya, and demonstrated political commitment to integrating zinc treatment into its standard diarrhea case management protocols. This policy document was printed with funding from PATH, Micronutrient Initiative, WHO and UNICEF and has been disseminated in five of the eight regions in Kenya with support from the four partners. PATH plans to continue to disseminate the policy to other regions as funding becomes available.

⁶ Analysis is restricted to the first child mentioned who was reported to have diarrhea within the past two weeks

The policy advocates for the use of zinc sulfate tablets along with sufficient ORS sachets over a minimum of two days as the standard, first-line treatment for childhood diarrheas. Antibiotics are recommended only for suspected or proven dysentery and cholera; anti-diarrheal agents and anti-emetics are not to be used; and anti-protozoal drugs are only to be used for the treatment of suspected and/or confirmed amoebiasis and giardiasis. Unlike many other countries, this policy statement recommends that salt-sugar solution not be used in the home management of diarrhea and that ½ liter ORS sachets be used as the standard in all government, private and non-governmental health facilities.

Zinc sulfate 20 mg dispersible tablets and low-osmolarity ORS sachets are both included in the 2010 Kenya Essential Medicines List. ORS is available even at the lowest level of the health system (Level 1 or community-based services through community health workers), while zinc is available to Level 2 (and above) facilities (dispensaries, health centers, clinics and hospitals). Zinc is currently available over-the-counter as a pharmacy-only product at pharmacies and chemist shops (duka la dawa). The GoK is moving toward reclassifying zinc to allow unrestricted distribution and use at the community level which is expected as early as June 2011.

F. Ministry of Health Units and Programs Related to Pharmaceutical Management, Supply Acquisition and Logistics, and Diarrhea Case Management

The Kenya Pharmacy and Poisons Board (PPB), which falls under the jurisdiction of MoMS, is the key regulatory agency with oversight over the registration, regulation and quality assurance of products; as well as the regulation of pharmacy practice, including the licensing of pharmacists, and dispensing technologists and both registration and regulation of premises. The PPB is responsible for quality assurance of locally produced and/or imported products for the Kenyan market and attendant pharmacovigilance (monitoring adverse drug effects) and post market surveillance. The PPB registered zinc sulfate in tablet form, allowing its use in Kenya especially in the public sector facilities before it became available in the private sector in 2007. Interviews of key informants at the PPB and within the private sector suggests it takes at least six months to register a new pharmaceutical product in Kenya. Four brands of 20mg dispersible zinc sulfate tablets and a number of low-osmolarity ORS brands have been registered and are available in Kenya (Z-DT, ZinCos, Dis-Zinc, and Zinc Sulphate). Essential health commodities (finished goods or raw materials for their local manufacture) are tax exempt and therefore do not incur any tariffs or VAT. There are limitations, however, on what can be widely promoted or advertised to the general public. Even IEC materials used in detailing/promotional campaigns targeted at the health providers, especially content/efficacy claims, are vetted by the PPB and respective sub-sector technical working groups.

The Kenya Essential Medicines Supply Agency (KEMSA) is the unit responsible for procurement of medicines and medical supplies and for warehousing and distributing those supplies to public sector facilities. However, there are other commodity procurement and distribution mechanisms serving the public sector including Kenya Pharma. KEMSA makes all purchases of drugs on behalf of both MoMS and MoPHS

through a tender process that allows both local and international manufacturers to participate. All medicines are quality assured through the National Quality Control Laboratory. Products that do not meet the agreed standard are shipped back or destroyed at the suppliers' expense.

KEMSA has seven regional warehouses and contracts with approximately 23 private transporters to deliver medicines and supplies to health facilities throughout the country. A previous Essential Medicines List (EML) contained over 800 products but limited funding reduced this list to around 500 different drugs and supplies. To reduce inefficiencies and maximize the return on the limited resources from the GoK, the EML has been reviewed, the number of products reduced, and the list of commodities KEMSA will procure, warehouse and distribute has been prioritized. KEMSA has further categorized these commodities to a priority "A List" of 110 products and another "B List" of 200 products. KEMSA will now procure all of the A list commodities but there is only enough funding from government to cover 50% of total requirements for public sector facilities each year. "B List" products are commonly used drugs but are purchased only if and when funds are available from government. Health facilities (provincial, district, sub-district, health centers and dispensaries) may order drugs on the "B list" from KEMSA when available, or may purchase with service charges or constituency development funds if MOH funding is insufficient. Zinc and ORS are on both the EML and the KEMSA's own high priority "A list".

Zinc sulfate tablets have been available in hospitals, health centers and dispensaries since 2008 when UNICEF provided an initial supply. Subsequently, zinc tablets (manufactured by Alkem Laboratories Ltd. India) were procured and distributed by KEMSA to the public health facilities; since 2010 the government has bought zinc sulfate tablets from Cosmos Pharmaceuticals, a local manufacturer. From 2010 to date, Cosmos has supplied over 4 million sachets of ORS and nearly 600,000 treatment doses (of 10 tablets) of zinc, both of which are provided free of charge at public sector health facilities.

ORS and zinc are supplied to health centers and dispensaries through a "push" system—two standard kits of "A list" products are provided quarterly to each health center and dispensary (health centers receive a kit with about 25% more quantities of each drug). This system has proven to be extremely inefficient given that some drugs are used up immediately while others expire on the shelves. Given that a set amount of zinc and ORS are delivered only quarterly to health centers and facilities, there is potential for stock-outs in these facilities should demand during the quarter exceed supply.

A "pull" system has been piloted in the country with support from DANIDA and KfW and the realized efficiencies are driving the commodity distribution system in the health sector in that direction, with an expected full migration to a "pull" system by 2012. The pull system will allow these lower level health facilities to forecast demand and order what they need. Currently the public health facilities implementing the "pull" system are supplied on a bi-monthly based on orders they place with KEMSA. KEMSA also provides HIV/AIDS, reproductive health, and vaccination commodities to faith-based

organization- (FBO) run health facilities in the country as part of the sector-wide approach to service delivery.

Training of staff on the new diarrhea management protocols has been limited due to resource constraints. Service providers at hospitals and health centers from both public and private sectors are being trained via continuing medical education programs organized by hospitals or district health management teams; however, with regard to formal IMCI-related training, less than 10 percent of facility staff has been trained to date. There have been no specific efforts to either expand IMCI training (which is very costly) or to roll-out specific diarrhea management training focusing on the new protocols, therefore, overall awareness of the new protocol among health workers remains low. While public sector providers are prescribing zinc, quantities recommended are sometimes incorrect. Community health workers (CHWs) have been engaged in the promotion of ORS and zinc use in a few pilot districts. However, in the majority of districts CHWs are only allowed to provide ORS and must refer more serious cases of diarrhea to the health facilities. Respondents at MoPHS indicated their concern that in the absence of appropriate monitoring and supervision, zinc and other drugs may be misused but also mentioned their hope that in time with appropriate training and supervision that the CHWs can directly provide these types of treatments to their communities.

Although zinc is available in public sector facilities, demand for zinc treatment has been limited. The MoPHS, with the assistance of UNICEF, WHO and other partners has implemented semi-annual Child Health Weeks (Malezi Bora or Good Nurturing in Kiswahili) during which vitamin A, deworming, EPI catch up and other child health actions are promoted. In November 2008, diarrhea prevention and management was highlighted and posters with key messages were printed and distributed to all public health facilities. Although zinc was available by that date in the facilities, treatment with ORS and zinc was not the main focus of the campaign.

Currently a number of USAID and UNICEF programs are addressing both training and promotion of zinc and ORS in the public sector. USAID's major bilateral program: AIDS, Population, Health Integrated Assistance (APHIA) Plus, is playing a major role in capacity building of staff at health centers and dispensaries. The APHIA partners are working closely with their respective District Health Management Teams to fulfill annual operational plans. This includes taking varying approaches to capacity building including mentoring, on-the-job training, IMCI refresher training through in-service courses, etc. APHIA Plus partners have plans to address gaps in diarrhea management and to advocate for implementation of the protocols at all health facilities. Some APHIA partners also plan to include private sector providers (doctors and clinical officers) in their training programs. APHIA Plus lead organizations also provide some assistance in ensuring that zinc and ORS are available in health facilities during emergencies. APHIA partners, especially PATH, have developed training manuals and wall charts and are in the process of improving job aids for facility-based workers.

APHIA Plus partners recognize the importance of community mobilization and interpersonal communications in improving diarrhea management practices and have included both CHW training on the new diarrhea management protocols and the development of community-based interpersonal communication materials. Several of these APHIA partners include CHW supervision in their activities. See section F, below, for a description of two zinc pilots involving CHWs conducted in Western and Nyanza provinces.

USAID's Maternal and Child Health Integrated Program (MCHIP) is working at the national level to strengthen health systems, share best practices, and improve community case management of childhood illnesses. In the area of child health, MCHIP is working with APHIA Plus partners to disseminate the new policy guidelines to select provinces, establish ORT corners within health facilities, and to ensure that ORT and zinc are included in trainings for health workers. MCHIP is a member of the national level technical working group (TWG) and the interagency coordinating committee (ICC) for child health. Through the national committees, the project working to advocate for the reclassification of zinc from its current "pharmacy only" status to level one status on the Kenya Essential Medicines List so that it can be made available through CHWs, kiosks and other fast moving consumer goods outlets.

In addition to the USAID programs, UNICEF is currently working with Save the Children, WHO, AMREF and other partners to develop a standardized national training curriculum and guidelines for CHWs. Partners are also developing job aids for health workers, CHWs, and caregivers. However, at the current time, UNICEF only has funding to disseminate these materials in 3 (Isiolo, Marsabit, and Samburu) of the 270+ districts.

There is also a critical need for revisions in pre-service training curriculum to include the new diarrhea management protocols. Trainers at MOH have not been trained in these new protocols and new nurses and clinical officers interviewed were not aware of the new diarrhea treatment protocols

G. Faith-based/Mission Sector Programs

Faith-based organizations (FBOs) in Kenya play a significant role in the provision of health care services in remote, rural and underserved areas. This sector, which operates over 600 health facilities in Kenya, is composed of the Christian Health Association of Kenya (CHAK), the Kenya Episcopal Conference-Catholic Secretariat (KEC-CS), and the Supreme Council of Kenyan Muslims (SUPKEM). They have joined forces to create a forum for regular engagement with the GoK and MOH through a technical working group. CHAK and KEC-CS can obtain medicines through direct purchase from pharmaceutical companies, from KEMSA, or from their own Mission Essential Drugs Supply (MEDS) agency. MEDS receives some government and donor commodities (particularly ARVs, TB drugs, and vaccines) but the majority of their supplies are purchased under tender and are sold at low cost to clients, with mark-ups covering cost of goods, transportation and administration. MEDS currently purchases zinc and lo-ORS

from Cosmos although 550 of the 600 CHAK dispensaries receive the KEMSA drug kit on a quarterly basis along with the MOH health facilities. CHAK has, in the spirit of sharing and strengthening the national health system, historically shared resources with the government. Recently CHAK signed a memorandum of understanding with the Ministry of Health to have specific FBO health facilities provided with government-funded human resources, support for monitoring and evaluation, and commodities. Like government-owned health facilities, these faith-based health facilities function under the general oversight of District Health Management Teams which are responsible for all health services within each district.

The FBO health sector provides weekly continuing medical education (CME) seminars at larger hospital facilities and organizes regular training and/or mentorship programs at their smaller, more remote dispensaries. They also have their own radio stations that could be used in awareness creation programs.

H. Diarrhea Management Pilot Programs

PATH, with independent funding, conducted a zinc pilot program in Western Kenya between 2008 and 2010, training both health facility and community health workers, re-establishing ORT corners at health facilities, providing counseling on water and sanitation and hygiene issues, conducting mass media (radio with call in discussions)/community mobilization programs through CHWs and assuring that zinc (locally manufactured ZinCos from Cosmos) was available in both public (at no cost) and private sector outlets in the region. Program data are currently being analyzed by PATH, but program managers report that use has been good, and demand in public sector facilities has been high, resulting in stock outs of zinc in a number of public facilities. Best practices gleaned from pilot activities are being integrated into APHIA Plus implementation activities.

Johns Hopkins University and the U.S. Centers for Disease Control (CDC) collaborated from January 2008 - March 2009 on a community-based pilot in Nyanza province, using CHWs to regularly distribute zinc and ORS in advance of diarrhea episodes. CHWs visited homes every two months providing new supplies of ORS and zinc tablets (procured from Nutriset in France). Use rates were high: 55% of households in intervention districts versus 6% of households in control districts where caregivers had to seek treatment outside the home (zinc was available at only one hospital in the control district). ORS use rates were similar (58%) in both districts. While this approach is not sustainable financially or operationally, it does show the importance of caregiver access to product and the importance of interpersonal communication in promotion of correct use. To date, there has been no general promotion of zinc use and none of the households in this study has purchased zinc from a private sector chemist. In addition, no sensitization sessions for the private sector have taken place resulting in limited demand. According to interviews with the CDC team, providers in the area still think of zinc as a “trial” drug rather than an accepted MOH protocol.

I. Social Marketing Organizations

There are currently no social marketing organizations marketing or promoting use of ORS and zinc as part of the standard diarrhea treatment regimen. In 2009, Population Services International, an NGO which actively markets three household water disinfection products to reduce water-borne diseases including diarrhea, conducted a market feasibility analysis and concluded that the time was not right for them to enter the market with a zinc product. The study concluded that there was need to consider introducing zinc at some time in the future. PSI supports the general view that zinc needs to be reclassified to allow it to be accessible in community outlets selling “fast moving consumer good” (retail shops) or kiosks. This will make zinc more accessible to those who need to use it and can buy it from the private sector.

IV. Marketing Zinc for Diarrhea Treatment through Kenya’s Private Sector

A. Products

A range of diarrhea treatment products are available and in use in both public and private sectors including antibiotics, probiotics, and anti-protozoals. A sampling of these products and their prices are provided in Table 5. In addition, there are a number of multiple vitamin syrups and drops containing zinc for sale in pharmacies, ranging in price from 200-420 KES.

Table 5. Locally available diarrhea treatments

Drugs/formulations	Facilities where respondents reported these being dispensed	Manufacturer	Consumer/retail price per table/bottle in Kenya Shillings ⁷
Syr. Generic Flagyl 60 ml	Retail pharmacy	Sanofi Aventis	30 KES
Syr. Generic Flagyl 100 ml	Retail pharmacy	Sanofi Aventis	50 KES
Syr. Augmentin-Branded	Retail pharmacy	GlaxoSmithKline	500 KES
Syr. Augmentin – Branded Generic	Public/private health facilities	-	300-400 KES
Florinorm (probiotic)	Retail Pharmacy	PRISMA	75/Sachet
Syr. Entamoxin (flagyl) 100 ml	Retail Pharmacy	Sphinx Pharma	100 KES
Syr. Amoxicillin 100 ml	Faith-based health facility	-	50 KES
Syr. Septrim 100 ml	Faith-based health facility	-	40 KES
Syr. Ampicillin 100 ml	Faith-based health facility	-	60 KES
Tab. Zinc Sulfate	Public and faith-based health facilities; retail pharmacies	Prisma; Square Pharmaceuticals; Cosmos Pharmaceuticals	6-30KSH per tablet
Cap. Loperidole/motilium -Generic	Retail Pharmacy	-	30 - 50KSH per pack

⁷ KES = Kenya Shilling - US\$1=81 KES (May 2011)

As stated previously, zinc sulfate 20mg tablets were registered in Kenya and introduced into market in 2007. To date, four brands of 20 mg zinc dispersible tablets have been registered by the PPB. These include one locally manufactured product (by Cosmos Pharmaceuticals) and three imported zinc formulations. Irrespective of source, these products sell to wholesalers at 4-4.5 shillings per tablet. Retail prices range from 6 to 30 shillings per tablet although the majority of pharmacies visited are selling the zinc tablets in the 6-10 shilling range, as shown in Table 6. Alkem Laboratories Ltd. India imported zinc sulfate to service a one-off government tender but it is not available in the retail market.

Table 6. Locally Available Zinc Treatments

Brand	Company	Type	Strength	Consumer Price
Z-DT	Ace (Square Pharmaceuticals – Bangladesh)	Tablet	20 mg	KES 6-30/tablet
DisZinc	Prisma (Sai Mira Innopharm -- Chennai, India)	Tablet	20 mg	KES 7-10/tablet
ZinCos	Cosmos Pharmaceutical (Kenya)	Tablet	20 mg	unknown

Ace/Madawa Pharma, the current market leader, imports 20 mg zinc sulfate tablets, under the brand name Z-DT, from Square Pharmaceutical in Bangladesh, a UNICEF pre-approved producer. These tablets were the first to be introduced in the commercial retail market in Kenya and are sold for 6-30 KES tablet or US\$0.75-\$3.75 per 10 tablet treatment. The majority of retail outlets quoted a 10 KES (US\$0.12) per tablet price during interviews. Ace/Madawa has a team of 10 medical reps who market zinc, along with other products, throughout the country. The team has promotional materials (IEC materials, posters and detailing sheets) supplied by Square and it concentrates primarily on providers in private hospitals and ethical promotion/detailing to pediatricians and clinical officers in urban centers. They have about two distributors of the products in every large and medium sized town throughout the country. Ace/Madawa recently sponsored a session at the Pharmacy Society of Kenya meeting in Mombasa to promote their Z-DT brand and have partnered with USAID-funded programs in the past to promote pharmaceutical products.

Philips International (Kenya), the distributor for PRISMA, a UK-based pharmaceutical firm, imports 20 mg zinc sulfate tablets manufactured by Sai Mira Innopharma Pvt Ltd, based in Chennai, India. PRISMA markets its zinc brand, under the brand name Dis Zinc, which is packaged in boxes of 30 tablets. It is available throughout Kenya, especially in pharmacies/chemist shops. At the retail level, this brand sells for KES 9-10 per tablet or \$US1.10- 1.25 per ten tablet treatment. PRISMA began importing zinc sulfate tablets into Kenya in response to the WHO/UNICEF Joint Statement and at the request of local pediatricians. Their marketing of the product consists of detailing by medical representatives who visit pediatricians, medical officers, and general practitioners at both government and private facilities, and promoting the product to doctors located at hospitals and MCH units who recently graduated. Philips has a very aggressive pediatric marketing team which promotes three pediatric health products. They have developed a marketing/detailing leaflet, which they use along with the WHO guidelines, encouraging targeted providers to prescribe by the brand name. The margin

on zinc is very small and the company regards DisZinc more as a social responsibility product. Philips also sell the probiotic, Florinorm, as a diarrhea treatment which is their major pediatric money maker.

Cosmos Pharmaceuticals locally manufactures a 20 mg dispersible zinc tablet, which it markets under the brand name ZinCos. This product was largely developed for the institutional market and current sales from the commercial retail market are less than 1 percent of total sales. Cosmos imports its zinc-related raw materials from Europe and, for the past three years, prides itself on manufacturing zinc tablets of the highest quality which it supplies under tender to the public sector through KEMSA. Cosmos Pharmaceuticals has the capacity to manufacture a million tablets per day to meet local demand. For FY2010-2011 Cosmos sold about 600,000 zinc sulfate treatments and over 4 million ORS sachets to the government through KEMSA. Cosmos Pharmaceuticals does supply zinc to NGOs and FBO health facilities through its commercial pharmaceutical distributors and MEDS respectively for their diarrhea treatment programs—although these are relatively small amounts.

Alkem imported zinc from India, under the name, Zinc Sulphate, in response to KEMSA's institutional tender in 2008. These were supplied to KEMSA and made available in public sector facilities (hospitals, health centers, and dispensaries). Alchem has neither supplied the public sector nor the private market since.

The Kenyan market will soon see entry of two new zinc formulations. Universal Pharmaceuticals, a local manufacturer whose product is at the development stage, plans to enter the market within a year. In addition, Sai Pharmaceuticals is planning to introduce their zinc sulfate brand into the local market from McKoy, a manufacturer based in Mumbai. Universal was motivated to join the zinc market after discussions with doctors about the need for zinc in diarrhea treatment. Universal Pharmaceuticals also manufactures a low-osmolarity ORS under the brand name Uni-Lyte, which they supply to international NGOs, and export to many countries in Africa. Uni-Lyte is not available in the retail outlets in Kenya.

There are a number of ORS formulations in the Kenyan market, a sample of which are listed below in Table 7. The majority of brands sell for 10-20 KES (US\$0.125-0.25) per ½ liter sachet. Searle also markets its Pedialyte ORS in one liter sachets for the high-end market for 50-80 Kenya shillings (US\$0.65-1.00) in retail pharmacies. ORS formulations are widely available in chemist shops and government hospitals, health centers and dispensaries. CHWs are also allowed by law to dispense ORS to families within their communities. They obtain their supplies from their supervising health center or dispensary.

Table 7: Examples of ORS products available in the market in Kenya

Brand	Manufacturing Company	Flavoring	Consumer Price	Osmolarity
Orasalt	Sphinx Pharma	Orange	KES 10	Low
dts ORS	Cosmos Pharma Ltd.	Orange	KES 10-20	Low
ORS	Laboratory & Allied	Unflavored	KES 15	Low
Orasol	Biodeal Laboratories	Orange	KES 10	Low
Uni-Lyte N	Universal	Orange	Institutional only	Low
Pedialyte ORS	Searle	Orange	KES 80 (1 liter sachet)	Low

B. Pricing

The prices of zinc tablets and ORS formulations are provided in Tables 6 and 7 above. The margins on the range of the two products are below the standard in pricing tariffs. The standard margins on pharmaceuticals are typically: manufacturer/importer (10%), wholesaler (15%) and retailer (33%).

C. Distribution

There is a well-developed and sophisticated pharmaceutical distribution system in Kenya. Private pharmaceutical companies and their distribution agents service wholesalers and retail commercial outlets throughout the country in both urban and remote, rural areas. There are about 300-400 wholesalers in the country who service an extensive network of approximately 10,000 chemist shops/duka la dawa in Kenya (although only about 2000 of these pharmacies are registered and formally renew their registration certificates annually). Some prescriptions for pediatric zinc from both public and private providers and hospitals (spillover demand when government supplies are not available) are filled at pharmacies in the locality. There was compelling evidence of this in most of the pharmacies visited during the assessment in Naivasha and Machakos, and particularly in chemist shops located close to health facilities. Some of these pharmacies were selling as many as 300-400 tablets of zinc per month.

It is not uncommon for public sector health workers to also run their own private clinics. In addition, there are hundreds of faith-based health facilities operating throughout Kenya. As noted above, FBO/NGO health facilities obtain health commodities from MEDS or KEMSA or procure directly from distributors. Private clinics also obtain vaccines, ARVs and HIV test kits from KEMSA or donor supported programs. Health providers serving at the private clinics do procure and dispense drugs at their practice or write prescriptions that are filled in local pharmacies or chemist shops.

D. Promotion

To date there have been no generic demand creation activities to promote the use of zinc and ORS by consumers/caregivers or to influence the prescription practices of providers and/or dispensing pharmacy staff. As a result there is very low awareness about the new

diarrhea management guidelines among providers and consumers/caregivers. In addition, companies with zinc formulations in the market have only undertaken limited brand promotion activities because of these products' low margins. The little investment made by these players on brand promotion is largely limited to some detailing by medical representatives, and the distribution of a few posters and brochures printed with help of the brand owners (PRISMA and Square) to promote their products.

E. Extent of Demand

Extent of demand for zinc for families with children under 5 at various levels is estimated as follows:

Table 8. Extent of Estimated Demand for Zinc Treatments

Population of Kenya	41,071,000
Population Under 5 (UNICEF Diarrhea report)	6,540,000 children under 5
Average 3 bouts of diarrhea/year/child	1,962,000 treatments (of 10 tablets) needed
% of children seeking treatment outside the home during the last bout of diarrhea = 60%	1,177,200 treatments potential demand from all sources for those who sought care

Some respondents in the health system reported that 750,000 treatments were available in 2010 in both public and private sectors—or about 38% percent of optimal demand, indicating there is significant potential for market development and growth especially in the private sector market.

F. Available Channels of Communication

According to the 2008/2009 KDHS, 74 percent of the Kenyan population own a radio and 27 percent own a television. Overall literacy is 85%; 34% of women watch television at least once a week and 24% read a newspaper at least once a week. Ninety percent of men and 77 percent of women listen to the radio at least once a week. Interviews in country confirmed this analysis and most informants concurred that mass media, particularly radio broadcasts in local languages were the best channel to use to improve knowledge of caregivers, particularly by utilizing interactive programming such as call-in discussions, which are both very popular and regarded as informative by many people. Television advertising is a key informational tool for clinicians/providers, pharmacist and other key opinion leaders, although it is expensive. In terms of changing caregivers' use behaviors, the general consensus was that interpersonal communication via village discussion groups, messages provided by community or facility-based health workers, mother-to-mother support groups, community/CHW newsletters, and other community channels (mobile video units, drama programs, etc.) are key channels for both increasing awareness about diarrhea and appropriate use of zinc with ORS as a diarrhea treatment.

G. Reaching Providers through Professional Associations

There are a large number of professional membership associations in Kenya that can provide channels for provider sensitization. These include: Kenya Medical and Pediatric Associations, Kenya Clinical Officers Association, Nursing Council of Kenya, and the Pharmaceutical Society of Kenya. Other professional organizations that can be tapped to assist in the sensitization process among the faith-based and NGO sectors include CHAK, KEC-CS, and SUPKEM, which hold regular conferences and in-service training sessions for health staff.

In addition, the Kenya Health Federation, the arm of the Kenya Private Sector Alliance that advocates with government on policy issues relating to the sector can facilitate any planned zinc-related sensitization on its efficacy and use in diarrhea management. Its membership includes: pharmaceutical companies, hospitals, doctors, pharmacists, professional associations and insurance companies, the Federation of Kenya Pharmaceutical Manufacturers, the Kenya Medical and Pediatric Associations, etc. Furthermore, the Kenya Health Federation can advocate for zinc, assist in endorsing promotion programs and in organizing workshops for key opinion leaders especially on the quality zinc products available in the market. They can also assist in the identification of zinc champions/experts who can deliver technical presentations at the CME seminars and annual meetings.

To ensure effective scale up of use of zinc sulfate in Kenya there are three levels of health providers/stakeholders that need to be reached with a compelling message. These include:

- Academics: working with this group would enhance pre-service training to ensure necessary awareness and skills are developed using a curriculum that has zinc as part of standard treatment for diarrhea and increase acceptance of this new approach to diarrhea treatment by key academics and medical opinion leaders. The opportunity available to advocate for inclusion of zinc in the university curriculum includes the annual College of Health Sciences' Conference, where featured speakers can present academic research findings/papers on the use of zinc in diarrhea management.
- Institutions: health facilities that operate under the direction of the Medical Practitioners and Dentists Board—nurses, clinical officers, general practitioners and specialists who work in the Kenyan health system can be reached through this channel.
- Professionals: health workers at all levels of the health system can be reached through both monthly and/or annual meetings of their own professional associations, such as the Kenya Medical Association, Kenya Pediatric Association, the Pharmaceutical Society of Kenya, Kenya Clinical Officers Association, and Nursing Council of Kenya, etc.

V. Summary of Key Findings

1. Updated policies and guidelines on the use of zinc as treatment for diarrhea are in place. The single remaining policy hurdle appears to be the reclassification of

- zinc to a Level 1 drug, thus making it possible for CHWs to distribute it freely in community settings.
2. Although zinc tablets have been available in the public sector facilities since 2008, the GoK procures through KEMSA only about 50% of the annual demand of public sector facilities.
 3. Very little training has been done for the public sector staff on the new diarrhea treatment protocols, thus the overall awareness and knowledge about zinc use among public sector health workers is low. This has resulted very often in incorrect dosing and short duration of treatment by staff in health facilities.
 4. There has also been very limited training of private sector providers, chemists, pharmacy technicians or chemist counter staff on the new diarrhea treatment protocols. Thus, awareness of zinc and adoption of new treatment protocols is also low within the private sector.
 5. Kenya has a vibrant pharmaceutical sector with the capacity to both locally manufacture and import quality zinc products to meet total market demand. There are currently four registered products, two of which are available in the commercial market at a cost of about \$1.25/treatment; and one other is only available through public sector health facilities, at no cost, to meet the needs of the poor. Therefore product availability is not the limiting factor hindering use, and lack of demand remains the major challenge.
 6. Given low demand and relatively low margins, importers and manufacturers of zinc tablets have invested very little in demand creation activities such as mass media communications and marketing. As a result, zinc is not yet widely available or widely sold in retail pharmacies. The two firms (Ace/Madawa and Prisma/Phillips) with commercial products have invested in ethical detailing targeted largely at pharmacies and hospital staff in urban and peri-urban areas throughout Kenya.
 7. There have been very limited demand creation efforts focusing on the mothers of children under five year or health providers. This has impacted demand for zinc in both public and private sector facilities. Most respondents among caregivers interviewed did not know that zinc is an effective diarrhea treatment and one which enhances the immunity of the child and reduces mortality.
 8. APHIA II has implemented child survival interventions including diarrheal disease management training for health staff in the public and faith based sectors but not in the for-profit private sector. There has been a community component too to ensure mothers and the greater community are given practical lessons on hygiene, and preparing and giving anti-diarrhea treatments including zinc supplementation. There are plans to scale up these interventions under APHIA Plus.

VI. Recommendations

A. Public Sector Strengthening

- Continue to advocate for the reclassification of zinc to level 1 status so that it can be made available to CHWs to administer/dispense in the community and through kiosks and other fast moving consumer goods outlets.
- Ensure USAID-funded projects (especially APHIA Plus) and other partners support public sector dissemination of policies, guidelines and tools as well as training of service providers on diarrhea management at health center, dispensary and community levels.

B. Partnership with the Private Sector

First, developing and implementing a generic social and behavior change communication campaign based on formative research promoting use of ORS and zinc (both mass media and IPC/below the line promotion) could significantly increase awareness about the effectiveness of zinc with ORS as the first line treatment for uncomplicated diarrhea in children under five, and catalyze sustained increases in use. Both caregivers and providers need to know that zinc with ORS is now the recommended treatment for childhood diarrhea. As part of this strategy, it will be critical to cultivate champions among opinion leaders at senior levels of government, academia and/or within the medical profession who will advocate for improved diarrhea case management.

Secondly, to reinforce messages delivered through a behavior change communication campaign, there is need to implement a program to increase the knowledge and skills of providers and key opinion leaders at multiple levels throughout the country: academia, institutions and professional associations through seminars, sensitization session and continuing medical education opportunities. This training and other interventions need to reach deep into the private sector and include nurses and clinical officers who operate their own private clinics as well as pharmacy technicians and counter personnel.

Third, private sector pharmaceutical manufacturers and importers are keen to partner with USAID to build the nascent zinc market. Developing cost-share partnerships with importers and manufacturers would be an ideal way to further catalyze brand promotion activities. The resources brought in through these partnerships could cover the cost of detailing, printing of articles or materials, and brand promotion as well as sponsorship of continuing medical education seminars for providers at various levels on appropriate diarrhea case management.

Fourth, should USAID decide to support a whole market approach to improving diarrhea case management in Kenya, at least one local manufacturer requested technical assistance in developing a quality zinc sulfate tablet. Providing technical assistance to local manufacturers interested in producing zinc would help to build the capacity of the local industry. USAID/Washington provides funding to U.S. Pharmacopeia to assist local manufactures in multiple countries to achieve national GMP certification for zinc products and produce quality products that are registered with the country's drug regulatory authority. This support could also be provided to Kenya pharmaceutical manufacturers interested in partnering with USAID.

Fifth, the Ministry of Medical Services has a nascent Public Private Partnership unit with whom a public private partnership relating to zinc could be established. The development of a zinc-related PPP between government and the commercial sector would provide an excellent opportunity for the PPP unit to better understand how such a partnership can benefit both parties and leverage this to increase uptake of zinc. From the commercial side, pharmaceutical companies would contribute quality zinc products, their well-developed distribution system, and share costs of generic market development and promotion activities. The Ministry of Health, for its part, could agree to fast track reclassification of zinc to level 1 distribution, fast track approvals of mass media communication materials, endorse the mass media campaign and materials, and work with dispensaries and health centers to ensure that zinc is universally accessible at the community level.

Appendix 1. **LIST OF KEY RESPONDENTS FOR THE ZINC SULFATE ASSESSMENT**

Government of Kenya Ministries and Departments

1. Ministry of Public Health and Sanitation

1.1 Division of Child and Adolescent Health Tel 254-20-272 5694

Dr. P. Santau Migiro, Program Manager

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Lydia W. Karimurio, Program Officer, tel: 254-20-272-5694

lkarimurio@yahoo.com, lkarimurio@gmail.com

2. Ministry of Medical Services

2.1 Kenya Medical Supplies Agency (KEMSA) Tel: 254-20-392 2000, 537 670/1/2/3

Mr. Kiumbura Githinji, Business Development Advisor

Kiumbura.githinji@kemsa.co.ke

Ms. Caroline Gishinga

3. Public Private partnership (PPP) Unit

Mr. Elkana N. Ong'uti, Chief Economist Tel: 254-20-271-7077

Elkana.onguti@health.go.ke

4. Pharmaceuticals and Poisons Board

Dr. K. Koskei, Chief Pharmacist and Registrar; Tel. 0720608811

Dr. J. Sioyi, Deputy Chief Pharmacist and Registrar; Tel. 0737889381

5. Lari Health Centre, Naivasha County

Mr. Jesse Mwaura ; Tel. 0712226074

Mr. Moses Kimtut; Tel. 0723803902

6. Maraigishu Dispensary, Naivasha County

Mr. David Thiongo

Mr. Phillip Simbelywet

Private and faith-based health facilities

7. Bishop U. Kioko Catholic Hospital

Ms. G. Muikali, Hospital Pharmacy

8. Avenue Health care. TEL: 3743694, 0721163727

Dr. Denis Ogolla, Managing Director

ogolla@avenuehealthcare.com

USAID and Implementing Agencies

9. USAID/Kenya Mission

Office of Population and Health Tel: 254-20-862-2000

Ms. Lynn Krueger Adrian, Director

ladrian@usaid.gov

Ms. Lilian Mutea-Muthui, FP/RH/MCH Specialist

lmutea@usaid.gov

Dr. Bedan Gichanga, Health Management Systems Specialist

bgichanga@usaid.gov

10. MCHIP - Tel: 254-20-375-1882/4

Ms. Nancy Koskei, Senior Program Advisor, Jhpiego

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Dr. Dan Otieno, Child Health Technical Advisor

oteinodj@gmail.com

Dr. John Alwar, MCHIP Country Director

jackajnoga@yahoo.com

11. Population Services International – Tel: 254 – 20- 271 4346/54/55

Ms. Daun Fest, Country Director

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Ms. Wanjiru Methenge-Mundia, Child Survival Marketing Manager

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Mbogo Bunyi

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12. PATH – Tel: 254-20-387 7177/80/89

Ms. Turi Omollo, Communications and Advocacy Officer

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Ms. Rosemarie Muganda-Onyando, Deputy Country Director

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Ms. Rikka Trangsrud, Country Director

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13. JHPIEGO (HENNET)

Dr. Kennedy Manyonyi

14. Centers for Disease Control

Mr. John Neatherlin, Deputy Director, International Emerging Infections Program

Tel: 0722 200 168.

jneatherlin@ke.cdc.gov

Dr. Robert Breiman

International Organizations

15. WHO Kenya Country office

Dr. Assumpta Muriithi, Child and Adolescent Health , Tel: 254-20-271-7902

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16. World Bank Kenya Country Office

Dr. G. N. V. Ramana, Lead Health Specialist, Africa Region, Tel: 254-20-322-6000

gramana@worldbank.org

17. UNICEF Kenya Country Office

Ms. Ruth Nashipayi Situma, Nutrition Specialist, Tel: 254-20 762-1581

rsituma@unicef.org

Associations

18. Kenya Association of the Pharmaceutical Industry

Dr. Moses Mwangi, Chairman, tel: 254-20-693 9123/141

Moses.Mwangi@sano fipasteur.com

Vinod Guptan, Treasurer - Tel: 374 7380/90/93/95

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19. Christian Health Association of Kenya

Dr. Samuel Mwenda Rukunga, General Secretary Tel: 254-20- 444 1920/ 5160/ 5543/ 1854

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20. Kenya Private Sector Alliance

Dr. Amit Thakker, Director – Tel: 254- 20 374-2907/5750/3895

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21. Kenya Pediatrics Association

Dr. Fred N. Were, Newborn Medicine Specialist, Tel: 254-20-271-4877/2748

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22. Kenya Health Federation

Mr. Walter Oookok, Director

Dr. Anastasia Nyalita, Bayer HealthCare, Tel: 254-20-856-0667-74

anyalita@bayerea.com

Pharmaceutical Manufacturers

23. Universal Corporation Ltd. Tel: 254 66 31450/60/61/62

Palu Dhanani, Managing Director

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Mr. Deepak Sharma, Marketing Manager,

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Dr George Muriithi, Pharmacist/Head of Quality Assurance

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24. Cosmos Pharmaceuticals Ltd. Tel 020 8042200/2/3/4/5, 0722333834, 0733666834

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Laxman Varsani, Director

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Dr. Vimal P. Patel, Director

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Pharmaceutical Wholesalers

25. Harley's Limited. Tel : 3747353, 3747380/90/93/95

Mr. Rupen Haria

Rupen@harleysltd.com

26. Madawa/Ace Pharmaceuticals Ltd. Tel 254 – 313472. 2243373

Dr. Iruki M. Kailemia, Managing Director

kailemia@africaonline.co.ke, madawa@africaonline.co.ke

27. Phillips Pharmaceuticals Ltd (PRISMA Agent) . Tel: 826-104/5/6/7, 6823660/1

Ms. Jane Muthoni Mwangi, National Sales Executive,

Jane_mwangi@phillipspharma.com

Dr. Daniella Munene, Company Pharmacist and Distribution Manager

Daniella_munene@phillipspharma.com

Retail Pharmacies

28. Queens Health Care Ltd (Naivasha County)

Mr. Aaron Rono

29. Elementaita Pharmaceuticals (Naivasha County)

Mr. James Kamau

30. Syokamau Pharmacy (Machakos County)

Mr. Wellington Mutie; Tel. 0725247451

welmutie@yahoo.com

31. Ben Pharma (Machakos County)

Mr. Dickson Mutua; Tel. 0726986016

32. Upper Hill Medical Centre Pharmacy (Nairobi County)

Dr. J. Nyabuto

Research Organizations Visited

33. Synovate Tel: 254-20-445 0190-7

Mr. Richard Wahiu, Head, Market Research

Wahiu.richard@synovate.com

Ms. Hilda Kiritu

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Ms. Betty Ochieng

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Local Consultants for the Zinc Sulfate Assessment

34. Nelson Gitonga, Insight Health Tel: 254-20-504-628

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35. Dr. William M. Muraah, Crystal Hill Tel: 254-20-273 0600

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