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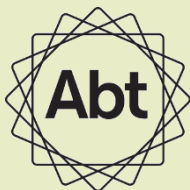


Strengthening Health Outcomes  
*through* the Private Sector

# Diarrhea Management Knowledge, Attitudes and Practices among Caregivers and Providers in Uganda

**SHOPS Project**  
Abt Associates Inc.

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**Abt Associates leads the project in collaboration with**  
Banyan Global  
Jhpiego  
Marie Stopes International  
Monitor Group  
O'Hanlon Health Consulting

# Background (1)



- Diarrhea is one of the leading causes of death among children under five
- In Uganda, diarrhea is the second killer of children after malaria.
  - Uganda's diarrhea prevalence rate in children under five was 26% (2006 DHS).
  - This rate is among the worst in developing countries.
  - Diarrhea is mainly associated with lack of cleanliness and consuming contaminated food or water
- WHO/UNICEF's joint statement (May 2004) recommending the use of Zinc and a new formulation oral rehydration solution (ORS) to manage acute diarrhea in children was adopted as policy by the MOH in 2007.

# Background (2)

- The USAID funded **AFFORD Health Marketing Initiative** in Uganda focused on pediatric diarrhea prevention and treatment
  - Programs initiated in 2007 with the launch of three key products: **Zinkid** (zinc tablets), **Restors** (ORS sachets), and **Aquasafe** (water purification tablets)
  - In **45 districts** located in all regions of the country, representing approximately 50% of the Ugandan population
  - **Uganda Health Marketing Group** (UHMG), an indigenous non-profit organization, mentored to carry out program objectives and sustain activities
  - Program components include: community sensitization sessions, mass media awareness campaign in 2009, detailing and continuing medical education opportunities for providers/drug sellers, zinc+ORS strategy development with MOH.
- Limited data on diarrhea treatment knowledge, attitudes, and practices in program districts



# Objectives / Research Questions



1. What are current *caregiver* knowledge, attitudes and practices related to diarrhea management for children aged 6-59 months?
  2. What are current *provider* knowledge, attitudes and practices related to diarrhea treatment?
- ✓ Focus is on the 45 districts in which UHMG is implementing its child health programs
  - ✓ Results will allow UHMG to quantify current levels of appropriate diarrhea treatment in their target population, and identify barriers that prevent caregivers and providers from correctly managing pediatric diarrhea

# Methodology



1. Caregiver survey:
  - Administered to a sample of caregivers of children 6-59 months old who have had diarrhea in the 2 weeks preceding the survey
    - Door-to-door screening of households to determine eligibility
    - Face-to-face interviews
    - 45-60 minutes each
2. Provider survey:
  - Administered to a sample of public and private providers (general practitioners and pharmacy counter agents)
    - Face-to-face interviews
    - 30-45 minutes each
- Data collection to coincide with rainy season (November-December)

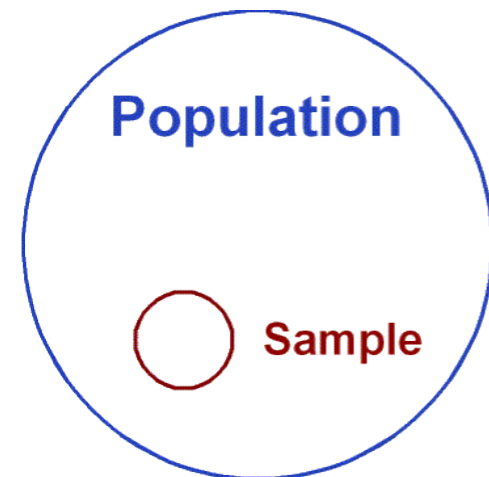
# Sampling - Caregivers



- Target: 800 caregivers of children aged 6-59 months who had diarrhea in the two weeks prior to the date of the survey
- Multi-stage sampling design:
  - At the *district* level:
    - Sample of 20 districts randomly selected from the 45 project districts
    - Selection of the 20 districts using probability proportional to size (PPS) sampling
    - 40 caregiver surveys per sampled district
  - At the *Enumeration Area (EA)* level:
    - 2 randomly selected EAs per selected district
    - 20 caregiver surveys per sampled EA
  - At the *household* level:
    - One randomly selected caregiver out of all eligible caregivers
    - One randomly selected child per eligible caregiver
- At the 95% confidence level, the margin of error with a sample size of 800 is approximately +/- 3.5 percentage points.
- Survey responses weighted according to the sampling strategy.

# Sampling - Providers

- Target: 60 providers (30 pharmacists/chemists and 30 doctors/clinical officers/nurses)
- Random selection from the 20 selected districts in the same areas where households are surveyed
- About 2-4 providers per district

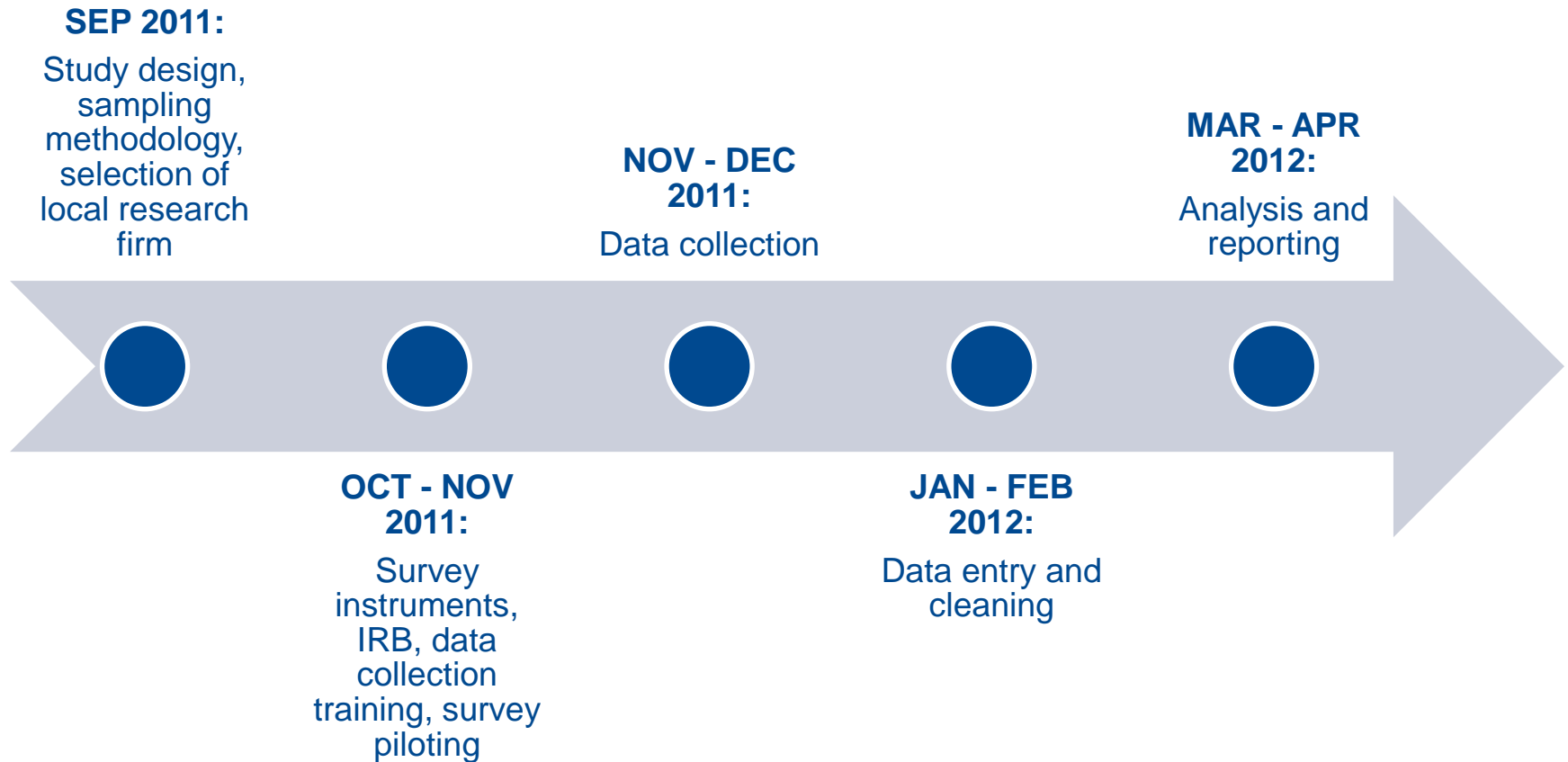


# Fieldwork

- Study reviewed and exempted by Abt IRB; reviewed and approved by Uganda IRB.
- Local research organization (SFG) contracted for fieldwork.
- Survey questionnaires translated to 11 different local languages.
- More than 60 data collectors and supervisors trained on data collection and quality control.
- Survey instruments (questionnaires and household screening forms) piloted following training.
- Data collection over 3 weeks:
  - 3,425 households screened
  - 803 caregiver surveys completed
  - 71 provider surveys completed
- Data captured and cleaned in CSPro; analyzed in STATA v11.



# Timeline



# FINDINGS (1)

- **Caregiver** knowledge, attitudes and practices related to diarrhea management among children 6-59 months



# Diarrhea prevalence

Number of households with children 6-59 months with diarrhea in the past two weeks	803
As a percent of total screened households with children 6-59 months	23%
Average diarrhea duration	5.2 days
Diarrhea with fever in the past 2 weeks	58.4%
Bloody diarrhea in the past 2 weeks	15.8%

- Prevalence rate in sample is close to prevalence rate in the entire population (26%)
- High percentage of diarrhea with fever (58%) – possibly due to high rate of malaria infections among children under 5?

# Advice and treatment

- 42.4% of caregivers sought advice for treatment, primarily from:
  - Public clinic: 30.3%
  - Private clinic: 30.6%
  - Friends/relatives: 27%
  - Pharmacy/drug store: 7.9%
- 75.3% of all children with diarrhea were taken to a professional health provider (clinic or pharmacy) for treatment.
- On average, child was taken to health provider for treatment 1.6 days after onset of diarrhea.

# Treatment advice received by source

	Public clinic (30.3%)	Private clinic (30.6%)	Pharmacy or Drug store (7.9%)	Friends/relatives (27.0%)
ORS	78.8	35.9	9.0	8.9
Zinc	3.8	3.6	2.8	2.3
Antibiotic	29.2	41.7	49.4	5.6
Antidiarrheal	52.7	35.4	67.9	10.4
Fever medicine	5.2	8.1	2.1	1.9
Anti-nausea medicine	3.6	7.5	9.8	3.8
<b>Total</b>	<b>99</b>	<b>84</b>	<b>22</b>	<b>103</b>

- Caregivers who went to public clinics most likely to report that providers advised they treat with ORS and antidiarrheals
- Those who went to private clinics most likely to report that providers advised they treat with antibiotics, antidiarrheals, and ORS
- Those who went to pharmacies most likely to report that providers advised they treat with antidiarrheals and antibiotics
- Not much ORS advice among pharmacists and hardly any zinc advice overall

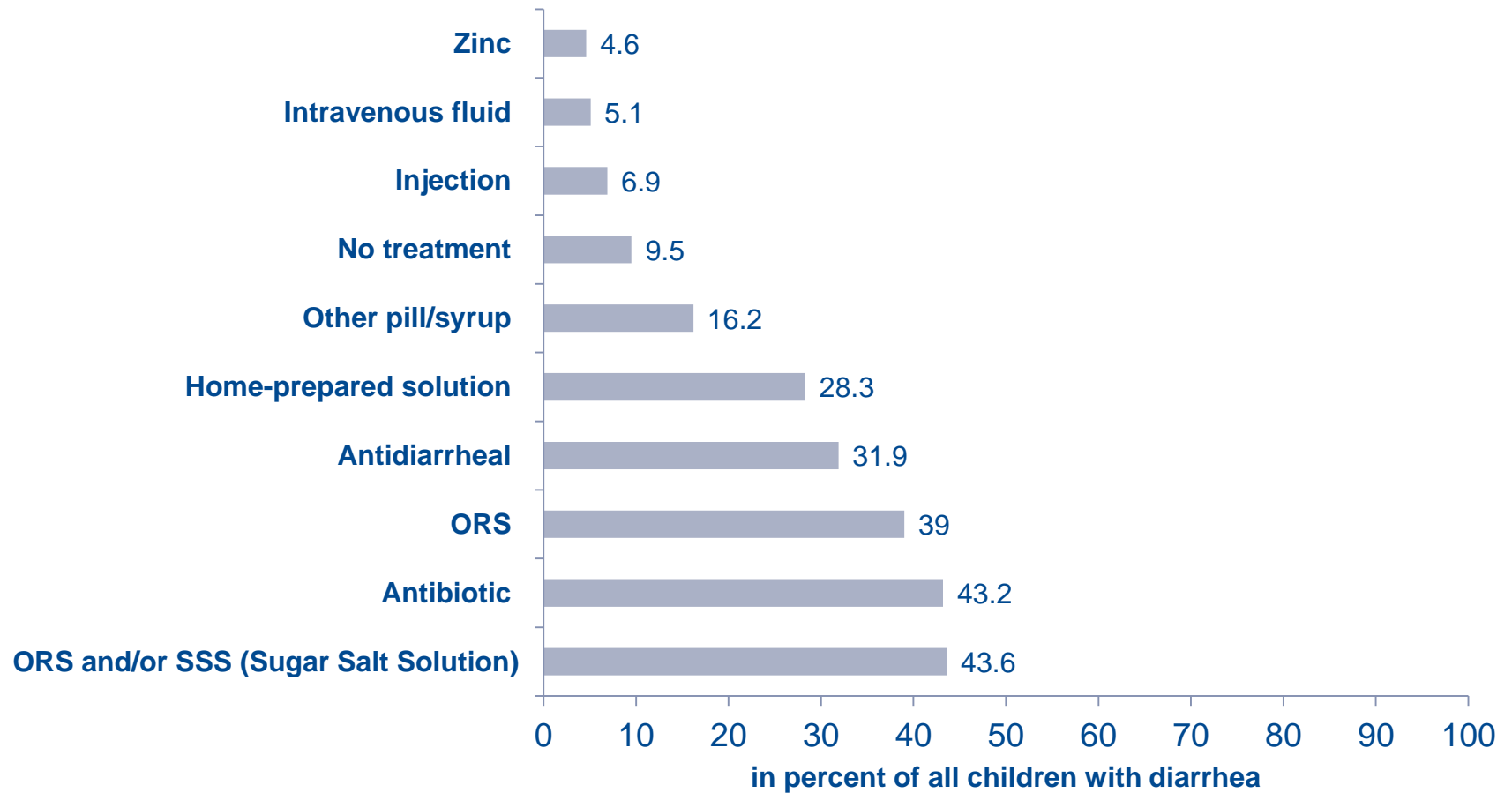
# Priority treatment requested by caregiver

In percent of caregivers who asked for a specific treatment (%)	
Antibiotics	36.6
ORS	29.9
Antidiarrheals	23.8
Restors	1.7
Zinc	0.9
Other	6.8
Percent of care seekers who asked for specific treatment	23.3
Total number of caregivers who sought treatment outside of home	639

- Bias towards Antibiotics.
- Hardly any request for Zinc.

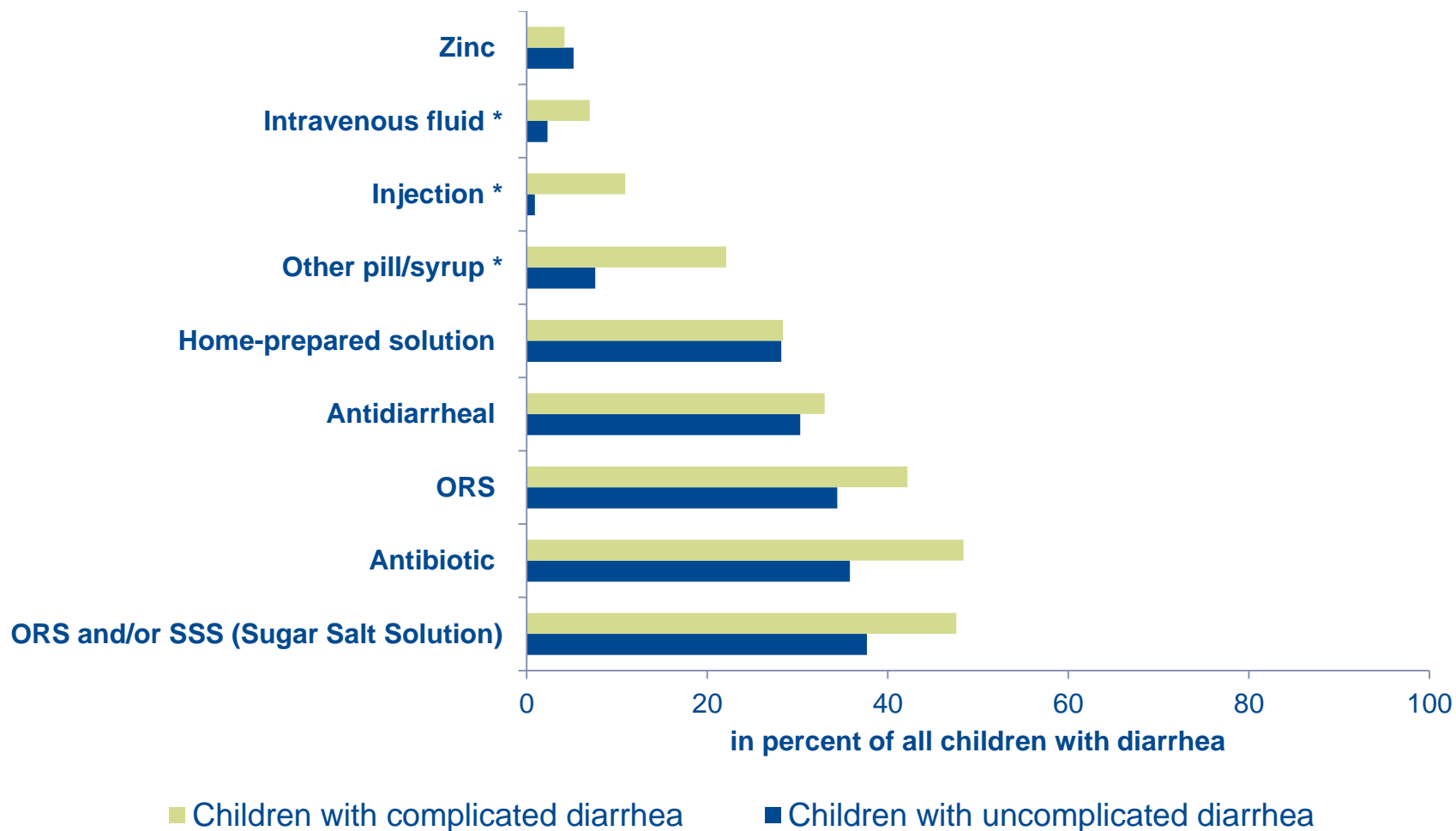


# Diarrhea management



- **ORS/SSS and Antibiotics are most common treatments.**
- **Zinc is least common treatment.**

# Diarrhea treatment by severity of case



Respondents may report multiple choices so the sum may exceed 100%; Complicated diarrhea is defined as diarrhea with fever, a bloody stool, or both.

\*Statistically significant differences between complicated and uncomplicated.



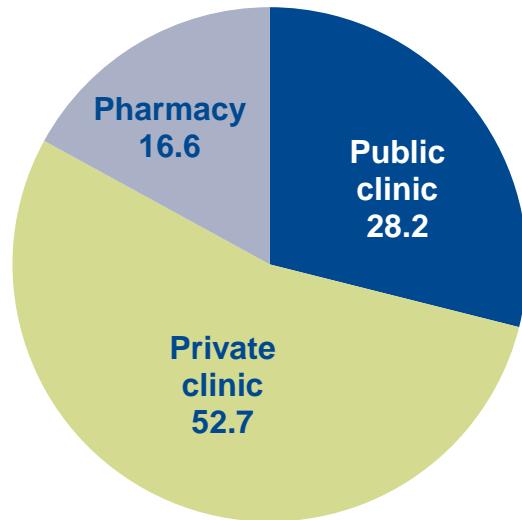
# Diarrhea management by income groups

- Sample of caregivers was divided into income quintiles
  - Wealth index constructed using asset ownership and household condition variables
- Overall treatment of diarrhea does not vary across income quintiles
- However:
  - Wealthier groups are significantly more likely to treat child with zinc ( $p = 0.015$ )
  - Poorer groups are significantly more likely to treat child with antidiarrheals ( $p = 0.004$ )
  - Poorer groups are more likely to treat child with antibiotics due to the fact that poorer children are more likely to suffer from complicated diarrhea ( $p=0.017$ )

# Reasons for giving Antibiotics; Sources

	Percent of children given antibiotic
The provider said it is more effective	52.5
Had fever with the diarrhea	20.0
I asked for an antibiotic	15.1
Blood in the stool	7.6
Other	4.8
Total number of children given Antibiotic	301

Source of Antibiotics

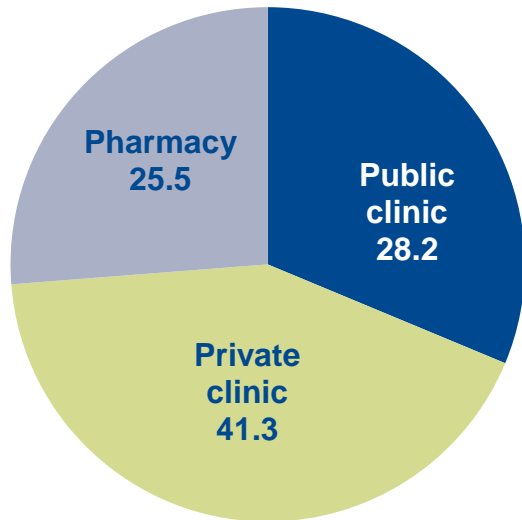


- Consistent with provider data: one of the main reasons given for prescribing antibiotics is “works best to stop an episode of diarrhea/most effective treatment”

# Reasons for giving Antidiarrheals; Sources

	Percent of children given antidiarrheal
The provider said it is more effective	68.8
This treatment has worked well for me in the past	19.7
I think it is most effective	9.4
I asked for an antidiarrheal	7.9
Total number of children given antidiarrheal	301

Source of Antidiarrheals

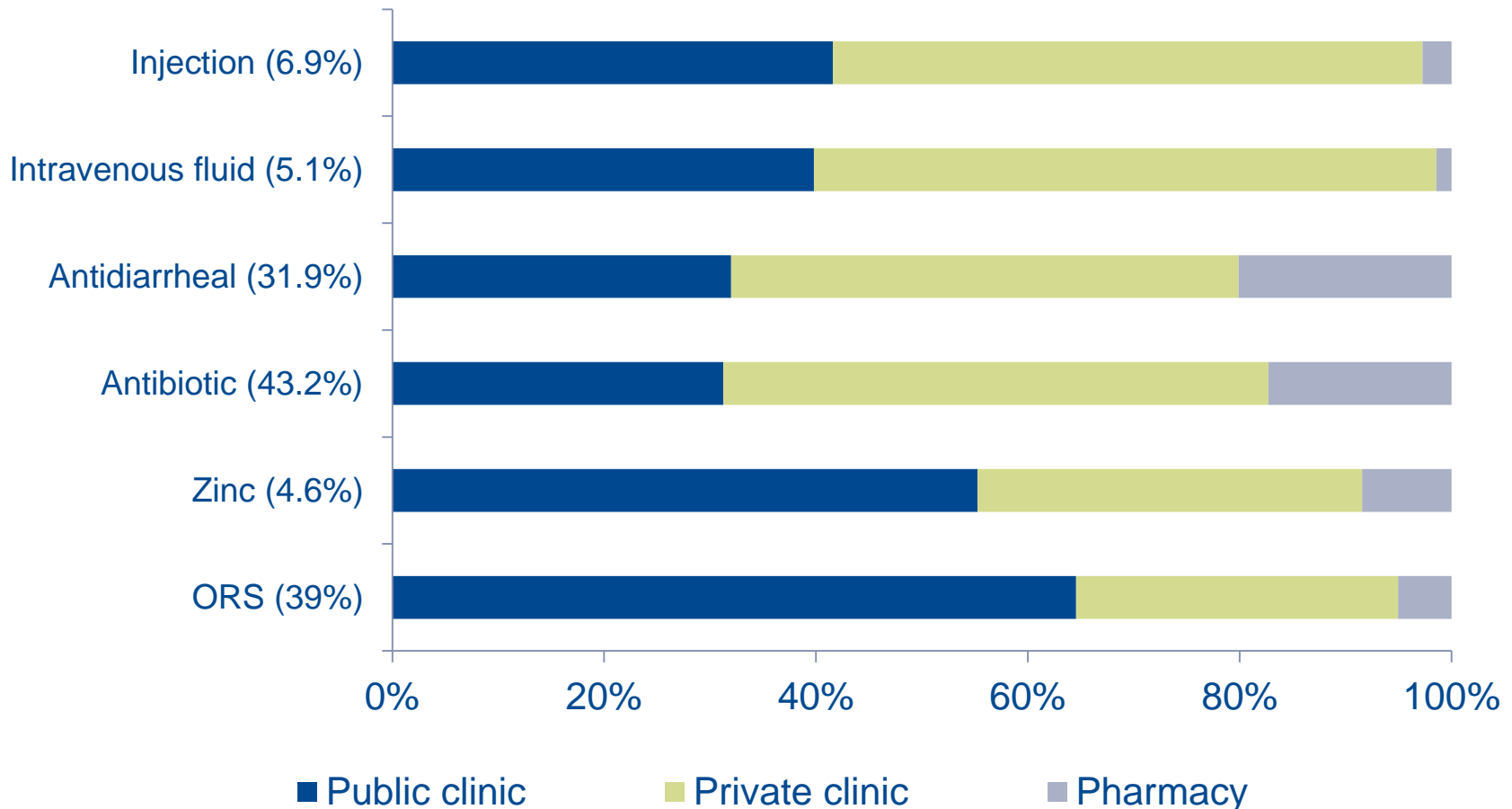


- Antidiarrheals should not be given to children, no matter the severity of the episode of diarrhea.

# No treatment

- 9.5 % of children with diarrhea were not given any treatment ~ approx. 75 children in sample
- Reasons include:
  - Child not very sick (46.3%)
  - Could not afford (15.8%)
  - Child teething or diarrhea episode just started (10.4%)
  - Didn't know where to purchase (6.2%)

# Source of treatment by treatment received



- **ORS and Zinc were mostly from public sector**
- **Antibiotics and Antidiarrheals, as well as injections and IVs, were primarily from private clinic & pharmacies**

# Treatment with ORS

- 39% of children with diarrhea are treated with ORS
  - Among those, 61.2% are treated with Restors
- 43.6% of children are treated with either ORS or SSS
- Reasons why ORS or SSS were not given:

	Percent (%)
Child not seriously ill	25.8
Not aware of ORS or SSS	23.2
Child/mother doesn't like	11.3
Couldn't find ORS to buy	11.2
It's not a real treatment	10.8
Don't know how to prepare SSS	5.8
Products too costly	3.5

# Treatment with Zinc (1)

	Among children with diarrhea (%)	Among zinc users (%)
Treated with Zinc	4.6	--
Treated with Zinkid	4.6	100
Treated with zinc along with ORS	3.4	74.6
Treated with zinc along with ORS for 10 days or more	0.8	17.8
First time users	3.2	70.7
Average number of tablets given to caregiver or purchased	--	9.2 tablets
Average number of days of zinc use		5.5 days
Total number of children	<b>803</b>	<b>53</b>

- High proportion used zinc along with ORS (but small in absolute number)
- But not for full 10 days → Consistent with findings in other countries
- High percentage of first time users

# Treatment with Zinc (2)

- Only 4.6% of children were treated with zinc.
- When asked why zinc, main responses included:
  - Recommended by provider (84.6%) – encouraging!
  - Used successfully in the past (12.5%)
  - Heard that zinc would reduce severity and duration (11.1%)
  - Recommended by friend/relative (7.1%)
- Among zinc users who said they used it because a provider recommended it, distribution of zinc sources is:
  - Public clinic (48%)
  - Private clinic (33.5%)
  - CHW (8.8%)
  - Pharmacy/drug store (5.1%)



# Treatment with Zinc (3)

- 58.5% of children were not treated with zinc for the full 10 days.
- When asked why not, main responses included:
  - Child was cured (49.4%)
  - Wanted to save remaining treatment for future illness (11.8%)
  - Thought I needed to give zinc only along with ORS (9.7%)
- Caregivers agreed the following strategies would be helpful to remember to use zinc for 10 days:
  - 10-day calendar (37.9%)
  - A cell phone text message (27.4%)
  - Visit from a CHW (24.2%)

# Cost of Zinc



	Percent (%)
<b>How Zinc was obtained (among zinc users)</b>	
Purchased	40.1
Free	56.5
<b>Amount paid for Zinc (among those who purchased)</b>	
Less than UGX 1,500	28.6
UGX 1,500 - 2,000	5.1
More than UGX 2,000	30.7
Don't know	35.7
<b>Opinion about price of zinc (among those who purchased)</b>	
Not expensive	18.4
Affordable	20.9
Expensive	35.8
Too expensive	6.3
No opinion	8.1
Don't know	10.5
<b>Number of caregivers who used zinc</b>	<b>53</b>
<b>Number of caregivers who purchased zinc</b>	<b>17</b>

- Large variations on price paid
- Caregivers split on opinion about price – but denominator is small

# Knowledge of Zinc

	Percent (%)
Heard a message about Zinc in last 3 months	17.4
Where heard/saw message on Zinc (among those who heard):	
Radio	76.7
Doctor/nurse	19.5
IEC-Health post/sub-health post	5.8
Friend, neighbor, or relative	5.9
Local pharmacist	5.3
Television	4.1
Banner/poster/flyer	0.6
Recall of Zinc messages	
Zinc reduces the duration of the diarrheal episode	49.6
Zinc is an appropriate treatment for diarrhea	37.2
Zinc reduces the severity of diarrhea	25.8
Zinc is available in pharmacy and health centers	11.9
Zinc should be taken with ORS	4.7
A complete 10-14 day dose of zinc should be administered	3.8
Number of caregivers who heard about Zinc in last 3 months	141

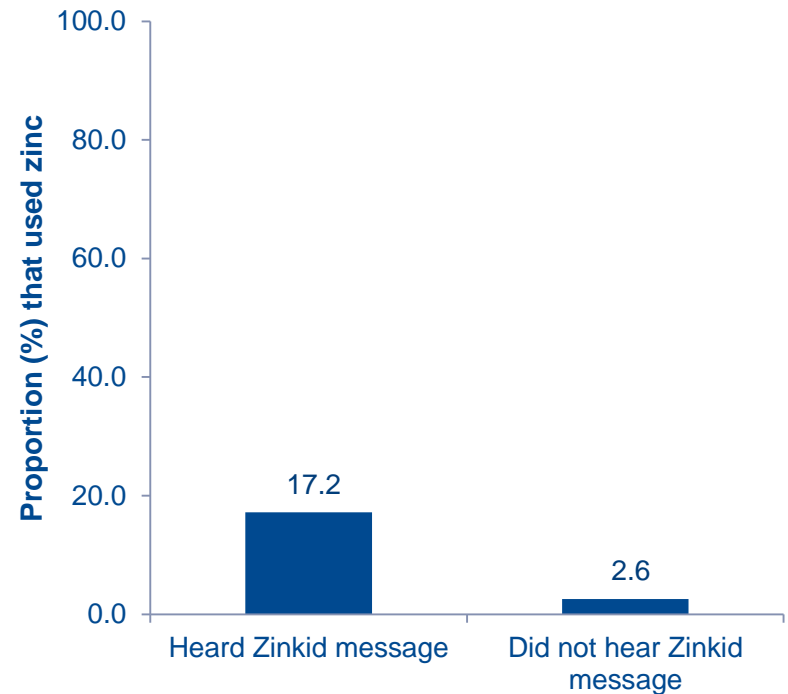
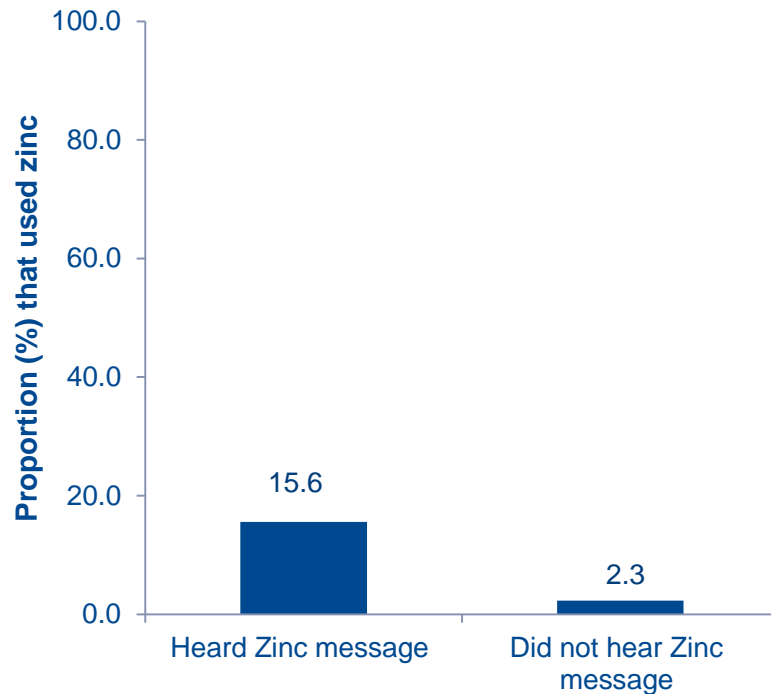
- Low overall recall of zinc messages (media campaign only ran in 2009)
- Messages heard mostly from radio, then health provider
- Very low recall of messages about correct use of zinc (with ORS, 10-14 days)

# Knowledge of Zinkid



	Percent (%)
Heard a message about Zinkid in last 3 months	13.9
Where heard/saw message on Zinkid (among those who heard):	
Radio	68.0
Doctor/nurse	19.9
Friend, neighbor, or relative	10.5
IEC-Health post/sub-health post	5.8
Television	4.8
Banner/poster/flyer	3.4
Local pharmacist	3.0
Recall of Zinkid messages	
Zinkid protects children from diarrhea	76.0
Zinkid should be taken with Restors (or ORS)	18.7
Number of caregivers who heard about Zinkid in last 3 months	113

# Zinc use and message exposure



- Correlation between message exposure and use of zinc.
- Those who heard zinc messages are at least 6 times more likely to use zinc than those who did not hear any zinc messages ( $p < 0.000$ ).

# Zinc use and source of Zinc message

Source of zinc message:	Among Zinc users (%)	Among non-users of zinc (%)
Radio (76.7%)	55.8	80.9
Doctor/nurse (19.5%)*	50.4	13.4
IEC-Health post/sub-health post (5.8%)	4.3	6.1
Friend, neighbor (3.6%)	2.5	3.8
Local pharmacist (5.3%)	5.6	5.3
Television (4.1%)	0	4.9

\* significant at the 10% level

- Zinc users are more likely to have heard the Zinc message on radio or from provider
- Non-users are more likely to have heard the Zinc message on radio
- Providers may be more effective than other messaging channels

# Zinc use behavior by recall of 'correct use' messages

- Correlation between use of ORS+Zinc and correct message recall:
  - Approximately 20% of users of zinc+ORS recalled the correct message “zinc should be used with ORS”, compared to 0% of non-users
- No correlation apparent between use of zinc for 10 days or more and correct message recall
- However, absolute numbers are very small!

# Attitudes towards availability of Zinc

% agreeing with statement	% of caregivers who heard of zinc	% of zinc users	% of non-users of zinc
Drug stores nearby always have zinc for sale	23.7	29.1	23.2
Zinc treatments are difficult to get around here*	76.2	60.5	77.6
There is a place nearby where you can get zinc when your child needs it*	31.3	49.9	29.6
You don't know where to get zinc*	46.3	7.3	49.9
Zinc treatments are too expensive*	60.0	37.2	62.1
You are willing to pay the current price for zinc	73.6	78.4	73.2
Zinc treatment products are available within walking distance of your home*	30.8	54.6	28.5
<b>Total number of caregivers</b>	<b>173</b>	<b>22</b>	<b>151</b>

\*p<0.005

note: not all zinc users answered these questions

- Issues with awareness of where to purchase zinc, mostly among non-users.
- Zinc users are more likely to be aware of places nearby to get zinc
- Non-users are more likely to agree that zinc is too expensive



# Attitudes towards effectiveness of Zinc

	Percent (%)
<b>Zinc tablets are effective for treatment of diarrhea</b>	93.4
<b>Effective because:</b>	
<b>Diarrhea stopped quickly</b>	67.6
<b>Child recovered quickly</b>	47.0
<b>Child regained appetite</b>	21.6
<b>Not effective because:</b>	
<b>Diarrhea did not stop soon</b>	3.4
<b>Child didn't like taste</b>	0.0
<b>Too hard to administer</b>	0.0
<b>Number of caregivers who gave zinc to child</b>	<b>53</b>

- Positive perception: most of zinc users believe zinc is effective, because the diarrhea stopped quickly and the child recovered quickly

# Knowledge and attitudes towards diarrhea causes and treatment

	%
<b>Knowledge (% agreeing with the statement)</b>	
Diarrhea can be caused by lack of cleanliness	97.5
Diarrhea can be associated with lack of cleanliness like not washing hands with soap and water before eating	97.9
Diarrhea can be caused by drinking unsafe water	93.3
Diarrhea can be caused by eating unhygienic food	95.7
Only those diarrheal episodes that have blood in stool require antibiotics	28.5
Most diarrhea can be managed at home without any drugs	22.8
Giving food based fluids is equally as effective as giving ORS	39.0
<b>Opinion towards threat severity (% agreeing with the statement)</b>	
Children under 5 years can die from diarrhea	95.8
My family will have a problem if one of the family members has diarrhea	87.5
It does not seem like anyone around here has a problem because of diarrhea	36.7
Diarrhea is a major health problem in my community	64.4
Diarrhea is a problem in poorer segment of the community only	44.4
<b>Opinion towards threat susceptibility (% disagreeing with the statement)</b>	
If my child gets diarrhea it is best just to do nothing as it will pass in time	13.4
The children under five in my household are healthy so their bodies could fight off diarrhea without doing anything	15.7
Children under five are too young to experience serious medical problems from getting diarrhea	13.8
I am not worried about the children under five in my household getting diarrhea	17.9
Children are more likely to get diarrhea than adults	86.7
<b>Total number of caregivers</b>	<b>796</b>

# Main takeaways (1)



- ✓ High percentage of children taken to a professional health provider for treatment. High percentage of children also had fever which may have influenced care seeking.
- ✓ High use of ORS and antibiotics (43%), moderate use of antidiarrheals and home-prepared treatments (~30%); however, very low use of zinc (<5%)
- ✓ Perception that child isn't very sick leads to lack of treatment, even with ORS for fluid replacement
- ✓ Reported provider bias towards:
  - ORS and antidiarrheal (public clinics)
  - Antibiotics (private clinics)
  - Antidiarrheals (pharmacies)
- ✓ Reported prescribing habits inappropriate: caregivers reported that providers think antibiotics and anti-diarrheals are effective treatments
- ✓ Hardly any zinc advice
- ✓ Among caregivers, bias towards antibiotics. No request for zinc.

# Main takeaways (2)



- ✓ Overall, high level of knowledge about diarrhea causes & risks, however, lack of knowledge about proper treatment
- ✓ Only 17% of caregivers had been exposed to any message about zinc/ORS – consistent with weak mass media efforts
- ✓ Heard mostly from radio (77%) then provider (20%), but providers were major source of information among zinc users (radio-55%, providers-50%)
- ✓ Very low recall of messages about correct use of zinc (with ORS, 10-14 days)
- ✓ Strong correlation between message recall and use of zinc
- ✓ Lack of awareness of where to purchase zinc, mostly among non-users
- ✓ Even though zinc is perceived as too expensive, caregivers say they are willing to pay for it; however, wealthier caregivers are significantly more likely to use zinc (radio, TV owners)
- ✓ Most zinc users believe zinc is effective because the diarrhea stopped quickly and/or the child recovered quickly

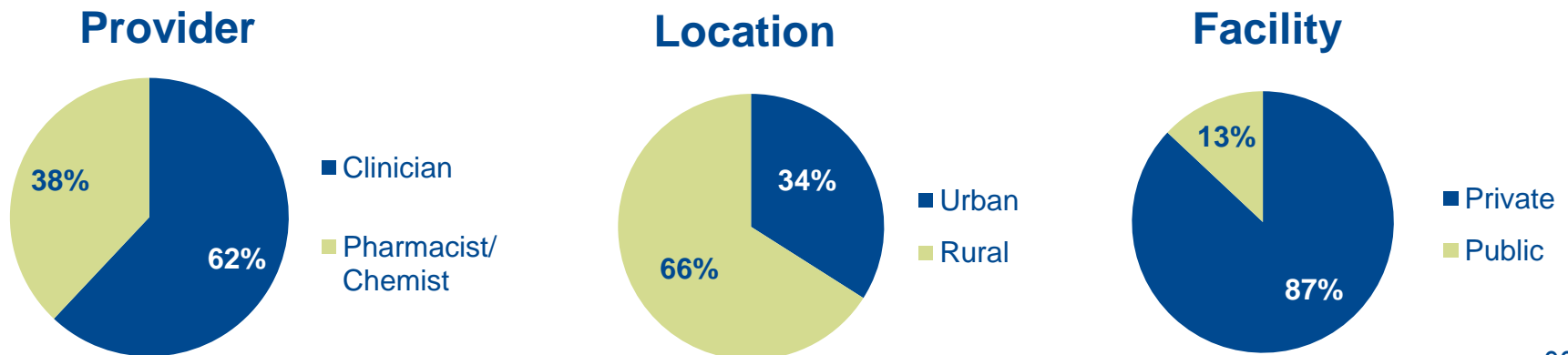
# FINDINGS (2)

- **Provider** knowledge, attitudes and practices related to diarrhea management



# Provider characteristics

- A convenience sample of 71 providers were interviewed.
  - 27 pharmacists/chemists (drug sellers) and 44 doctors/clinical officers/nurses at public and private health clinics
- More providers surveyed were located in rural areas (66%) than urban areas (34%)
- The majority of providers surveyed (87%) worked in the private sector



# Advice/counseling for diarrhea management

- Almost all providers (96%) reported that they carry products for treatment of childhood diarrhea
- Providers see on average **25** patients/clients a day (self-reported).
  - Of which, **6** cases per day for advice/treatment on diarrhea.
- The majority (94%) provide advice/counseling on treatment of childhood diarrhea. Most (76%) said that caregivers ask them for advice/counseling about how to treat/care for their child with diarrhea.
  - Providers relay important information about prevention of diarrhea (i.e. handwashing, sanitation, water purification) as well as treatment, particularly around prevention of dehydration (i.e. increasing fluids, giving ORS, referring severe cases to health centers).
  - However, providers are also a source of misinformation. Several stated that they counseled caregivers about the causes of diarrhea, including “worms” and “typhoid” – when in fact most childhood diarrhea is caused by viral pathogens.

# Most popular brands sold for treatment of childhood diarrhea

Overall zinc products are significantly more expensive than other diarrhea treatments

Type of Treatment	Most Popular Brands Sold/Provided	Price Range (1 USD = 2,433 UGX)
Oral rehydration salts (ORS)	1. Lyte 2. Restors	UGX 300 – 500 per packet
Zinc	1. Zinkid	UGX 2000 – 3000 per 10 tablets*
Antibiotic/Antiprotozoal*	1. Flagyl  2. Metrogyl	1. UGX 100 per tablet and UGX 2000 - 3500 per sachet  2. UGX 50 - 150 per tablet
Antidiarrheals	1. Kamodium 2. Charcoal	1. UGX 100 - 200 per tablet 2. UGX 100 - 200 per tablet

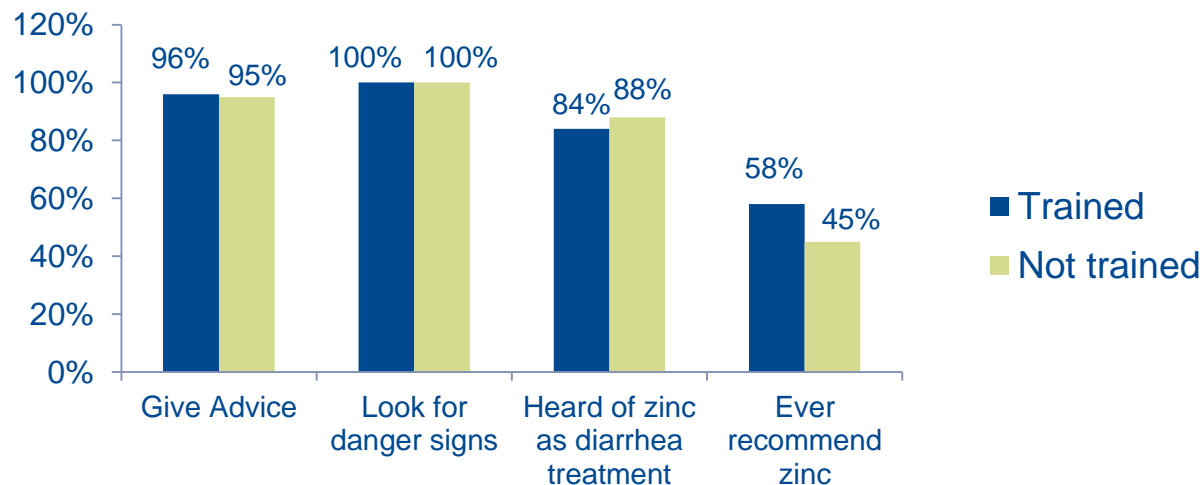
\* Official wholesale price of Zinkid is 1,400 UGX per pack of 10 tablets

NOTE: Providers did not appear to differentiate between antibiotics (i.e. ciprofloxacin) and antiprotozoals (i.e. metronidazole/Flagyl)



# Training in diarrhea management

- 39% of providers indicated that they had ever received training on diarrhea management
  - Most (71%) received a general training on the causes and types of diarrhea, and its prevention and treatment (including management of dehydration). **No provider specifically mentioned treatment with zinc as part of their training.**
  - Chemists (drug sellers) (13%) were less likely to have received a training than pharmacists (39%) and clinicians (44%)
  - Training did not appear to be associated with a significant difference in diarrhea management behaviors with the exception of a slight increase in ever recommending zinc for treatment of diarrhea



# Knowledge of danger signs

- All providers reported that they looked for danger signs when presented with a child with diarrhea
- However, knowledge of danger signs was very low. The only signs identified by a majority of providers were dehydration (67%) and sunken eyes (62%).
- Very few providers mentioned asking about/looking for blood in the stool (30%) or mucus (7%).
- No apparent difference in knowledge of danger signs based on type of provider

<b>Sign:</b>	<b>% of providers that mentioned</b>
<b>Dehydration</b>	<b>66.7%</b>
<b>Lethargy</b>	10.1%
<b>Restless or Irritable</b>	14.5%
<b>Sunken eyes</b>	<b>62.3%</b>
<b>Inability to drink</b>	7.3%
<b>Vomiting</b>	21.7%
<b>Mucus in the stool</b>	7.3%
<b>Blood in the stool</b>	<b>30.4%</b>

# Knowledge of diarrhea types

In general many providers were not able to differentiate between uncomplicated diarrhea and “a more serious type” of diarrhea. Among the few providers that were able to identify differences between the two types of diarrhea, many gave multiple examples. Answers included the following:

<b>Uncomplicated diarrhea (acute or persistent)</b>	<b>More serious type of diarrhea (like dysentery)</b>
<ul style="list-style-type: none"><li>• There is no blood in stool</li></ul>	<ul style="list-style-type: none"><li>• Has blood in stool</li></ul>
<ul style="list-style-type: none"><li>• Presents with running stomach and aching</li></ul>	<ul style="list-style-type: none"><li>• Dysentery causes a bulky stomach</li></ul>
<ul style="list-style-type: none"><li>• The child is not very weak and has good appetite</li></ul>	<ul style="list-style-type: none"><li>• Child is very weak and has no appetite</li></ul>
<ul style="list-style-type: none"><li>• Acute cases are mild and usually there is no fever</li></ul>	<ul style="list-style-type: none"><li>• Comes with high fever</li></ul>
<ul style="list-style-type: none"><li>• Acute diarrhea- child does not lose too much weight</li></ul>	<ul style="list-style-type: none"><li>• Dysentery is very serious &amp; the child loses weight quickly</li></ul>
<ul style="list-style-type: none"><li>• Uncomplicated presents with less dehydration</li></ul>	<ul style="list-style-type: none"><li>• Child is seriously dehydrated</li></ul>
<ul style="list-style-type: none"><li>• If the child is strong and can still play then that diarrhea is uncomplicated</li></ul>	<ul style="list-style-type: none"><li>• Child is lethargic, unconscious and not able to drink</li></ul>
<ul style="list-style-type: none"><li>• Eyes appear normal</li></ul>	<ul style="list-style-type: none"><li>• Complicated diarrhea causes sunken eyes</li></ul>
<ul style="list-style-type: none"><li>• Has a shorter duration and it is not too watery, although may have mucus</li></ul>	<ul style="list-style-type: none"><li>• Presents with prolonged duration of up to 2 weeks</li></ul>
<ul style="list-style-type: none"><li>• Less frequent stools</li></ul>	<ul style="list-style-type: none"><li>• Child passes watery stools very frequently</li></ul>

# Knowledge of diarrhea management

- Providers showed high level of knowledge about dehydration and the need for ORS.
  - Most providers (76%) assess dehydration with a skin pinch
  - 97% of providers agreed that “all children with diarrhea should be given ORS or increased liquids” and 96% agreed that “children with severe dehydration should be immediately referred to a health center.”
- Knowledge about the use of antidiarrheals in diarrhea management was mixed.
  - Almost half (46%) of providers disagreed (incorrectly) that antimotility or anti-diarrheal drugs *should not* be given to children under five years of age
- Knowledge about correct treatment with antibiotics was low.
  - Many providers (65%) incorrectly agreed that children with uncomplicated (acute or persistent) diarrhea and no fever should be given an antibiotic

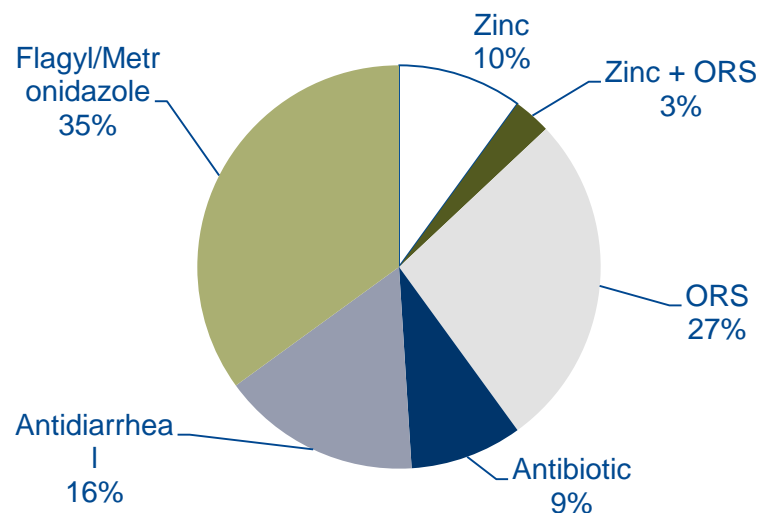
# Knowledge of standard treatment protocols

- The predominant treatments mentioned for uncomplicated diarrhea were ORS, antiprotozoals (i.e. Flagyl/Metronidazole) and antidiarrheals. Many providers recommended more than one treatment. 28% said that they gave zinc in addition.
- A low percentage of providers followed proper treatments for severe dehydration: either referral or intravenous treatment.
- Many providers followed proper treatment protocol for dysentery (treatment with antibiotics)

Type of diarrhea	Treatment Recommended (1)	Treatment Recommended (2)
<b>Uncomplicated Acute Diarrhea</b>	(n=70) ORS – 44% Flagyl/Metronidazole – 23% Antibiotics – 17% Antidiarrheals – 9% IV fluids – 4% Zinc – 3%	(n=40) ORS – 28% Antidiarrheals – 28% Zinc – 28%
<b>Severe Dehydration</b>	(n=50) IV/Glucose – 38% ORS – 36% Refer to hospital – 8%	(n=15) IV/Glucose – 40% ORS/SSS – 27% Refer to hospital – 13%
<b>Dysentery</b>	(n=47) Antibiotic – 40% ORS/IV fluids – 21% Refer to hospital – 15% Antidiarrheal – 9% Deworm/metronidazole – 9%	(n=18) Antibiotic – 39%

# Diarrhea treatment practices

- When asked what they usually recommended for treatment of childhood diarrhea, very few (13%) providers *first* mentioned zinc (or zinc + ORS) as the medicine/product they usually recommended for childhood diarrhea. A total of 16 providers (30%) mentioned zinc as either their *first* or *second* recommended treatment.



- All providers recommending Zinc (or Zinc + ORS) said this was because it “works best to stop an episode of diarrhea/is the most effective treatment”
- Roughly a third (35%) of providers first recommended an antiprotozoal (i.e. Flagyl/metronidazole). The main reasons given were that it: “works best to stop an episode of diarrhea/most effective treatment” and is “affordable to clients.”

# Diarrhea treatment attitudes (1)

In general there was a lot of misinformation among providers about the pathology of common childhood diarrheas as well as the merits of diarrhea treatment products. In terms of specific treatments:

- Providers are well versed on the merits of ORS.
- Providers understand the advantages of zinc. However, not many recognized zinc as a treatment for childhood diarrhea. Common answers included:
  - It treats diarrhea, although it is costly
  - Reduces the severity and duration of diarrhea as well as the number of episodes
  - It protects against occurrence of diarrhea
  - Zinc is a nutrition supplement and it provides zinc in the body
  - Helps children from being anemic and gives them energy
  - Has no side effects
  - Directions are easy to follow and it is easy to administer
  - It helps the child to gain more water and it stops stomach pain
  - Zinc improves appetite
  - It promotes the normal growth of a child
  - Zinc treats constipation

# Diarrhea treatment attitudes (2)

- When providers were probed about the relative merits of antibiotics (including metronidazole/Flagyl) answers included:
  - Antibiotics kill worms that cause diarrhea by acting as de-wormers
  - Antibiotics kill bacteria and treat bacterial and other germ infections in the body
  - Antibiotics are cheaper to the community members
- When asked about the merits of antidiarrheals, responses included a few misconceptions:
  - They treat infections in the body such as bacteria
  - They are easy to give to children because majority of caregivers believe in capsules
  - They prevent children affected with diarrhea from losing too much water
  - They stop diarrhea immediately upon swallowing.



# Caregiver treatment behavior

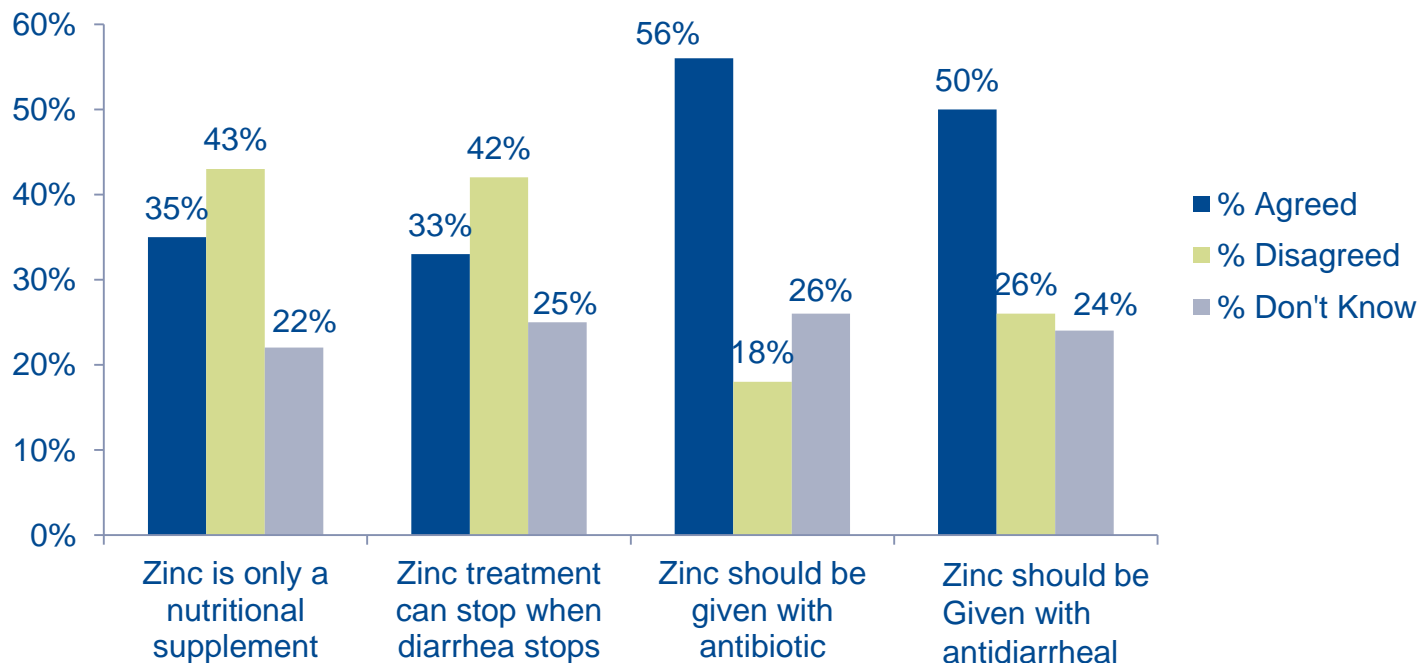
- Slightly more than half (58%) of providers stated that caregivers tend to ask for specific treatments/products for their children with diarrhea.
- The most common treatments requested are antibiotics (58%), antidiarrheals (40%), and ORS (28%)
  - 65% of providers that first mentioned either antibiotics or antimicrobials (Flagyl/metronidazole) as the treatment they usually recommended ALSO stated that caregivers commonly requested antibiotics.
- Regardless of the treatment requested, providers report that most caregivers only buy a “partial course” of the treatment
- According to providers, the main reasons caregivers give for not wanting to use ORS are:
  - *“Don’t like taste/child refuses to drink/vomits”* (43%)
  - *“Prefer antibiotic”* (27%).
  - *“Never heard of it.”* (22%)

# Zinc awareness

- 86% of providers had heard of zinc as a treatment for diarrhea
  - 47% via TV/Radio
  - 36% via continuing medical education sessions
  - 25% via medical or drug representatives
- The main message providers reported hearing about zinc is that it is an “effective treatment for diarrhea” (78%). Other messages recalled include:
  - Reduces duration of diarrhea (33%)
  - Nutritional supplement (32%)

# Zinc knowledge

- Provider knowledge of correct treatment with zinc was generally low.
  - 33% of providers incorrectly agreed that caregivers can stop administering zinc tablets when diarrhea subsides (and 25% did not know)
  - 56% incorrectly agreed that zinc should be given with an antibiotic to children under five with uncomplicated diarrhea (and 26% did not know).
  - 50% incorrectly agreed that zinc should be given with an antimotility or antidiarrheal drug to children under 5 with uncomplicated diarrhea (and 24% did not know).



# Zinc attitudes

- Half (50%) of providers that sold zinc products reported being concerned about the pricing. Of these, most (75%) were concerned that the retail price was too high.
- 38% of providers overall reported that margins were important when recommending certain products.
- 65% of providers agreed that recommending zinc with ORS “helps caregivers know that zinc is an effective treatment of diarrhea” (26% were not sure).
- Most providers (80%) have not encountered caregivers that have refused zinc. Among the few that have, the main reason given by caregivers, according to providers, is that they have “never heard of it” (43%).

# Zinc practices

- While almost all providers (96%) reported carrying products for diarrhea treatment, slightly less than half (41%) reported selling zinc products.
  - Interestingly, pharmacists were less likely to sell zinc (only 28% sold zinc) than clinic-based providers (44%) or chemists (56%)
- Half (51%) of providers reported that they had ever recommended zinc for children with diarrhea. The main reasons for recommending zinc were:
  - It is the most effective treatment for childhood diarrhea (77%)
  - Works well to treat childhood diarrhea (43%)
  - Zinc has a protective effect, reduces risk of future diarrhea episodes (26%)
  - Zinc reduces the severity of diarrhea (26%)
- The main reasons for NOT recommending zinc were:
  - Do not carry zinc in stock (47%)
  - Caregivers prefer antibiotics (21%)
- When asked what it would take for them to recommend Zinc plus ORS as the primary treatment for diarrhea, providers said:
  - Knowing zinc is an effective treatment for diarrhea (76%)
  - Having information about the merits of zinc over antibiotics/antidiarrheals (45%)

# Main takeaways (1)



- ✓ Low knowledge levels of the pathology (viral origin) of most childhood diarrheas and of danger signs
- ✓ High level of knowledge about dehydration and the need for ORS
- ✓ However, low knowledge levels of zinc, specifically the effectiveness and merits of zinc versus antibiotics and antidiarrheals
- ✓ Knowledge about correct treatment with antibiotics was low
- ✓ Most providers had heard of zinc as an effective treatment for diarrhea, although knowledge of correct treatment with zinc was generally low, less than half of providers stocked zinc, and very few mentioned zinc as a priority treatment for diarrhea

# Main takeaways (2)



- ✓ Training on diarrhea management has not been associated with increased prescription of zinc and ORS for uncomplicated diarrhea\*
- ✓ Caregivers typically request treatments – most common are antibiotics, antidiarrheals, and ORS.
- ✓ Most caregivers only buy a partial course of the treatment
- ✓ The cost of treatment and profit margins are playing a role in the type of treatment providers recommend for childhood diarrhea
  - ✓ In general zinc tablets are priced well above antidiarrheal and antibiotic tablets.
  - ✓ The cost of zinc may have influenced provider willingness to stock zinc products and prescribe it as an effective treatment
- ✓ Information on effectiveness of zinc and its merits over antibiotics/antidiarrheals seem important for changing current behaviors of providers

\* UHMG's program for providers included disseminating a brochure on the benefits of using RESTORS and ZINKID and comprehensive presentations on diarrhea management during Continued Medical Education sessions. They reached a total of 200 drug sellers during CMEs.

# Conclusions and Recommendations: Caregivers

- Caregivers' level of awareness about causes of diarrhea is adequate but awareness of appropriate diarrhea treatments is poor. According to providers, caregivers demand specific treatments (primarily antibiotics) for their children. This in turn influences which treatments providers recommend.
- Need for stronger and more sustained demand creation efforts to improve caregivers' knowledge of zinc and where to purchase it.
- Campaigns should relay the following key messages about childhood diarrhea treatment to both audiences (caregivers and providers):
  - Zinc + ORS is the most effective *stand-alone* treatment
  - Only diarrheal episodes that have blood in stool require antibiotics
  - Zinc must be taken for the full 10 days, even after the diarrhea subsides, in order to protect against future episodes. Emphasize the protective effect of zinc.
  - Antibiotics are ineffective treatments for uncomplicated childhood diarrheas
  - Antidiarrheals should NEVER be given to children



# Conclusions and Recommendations: Providers

- Providers are an important source of information for caregivers. Indeed, most caregivers said their provider was their primary source of treatment/advice for childhood diarrhea
- Providers have a lot of misinformation about the pathology of childhood diarrhea and the merits of treatments for childhood diarrhea.
  - Need to educate providers about the pathology of most childhood diarrheas, and on the effectiveness and merits of zinc versus antibiotics and antidiarrheals through messaging via multiple channels, including integrated trainings/CMEs that focus on the whole picture

# General Conclusions and Recommendations

- While zinc use was low there is acceptance of ORS among caregivers and providers alike. Co-packaging of zinc with ORS could help to increase uptake of zinc as well as serve as a reminder to take both together.
- Few caregivers knew where to purchase zinc and less than half of providers stocked zinc products. Message campaigns should include information about where to purchase zinc. Moreover, demand generation campaigns must be accompanied by marketing activities with private providers, thus ensuring adequate supply and availability of the product in the private sector market.
- Price of zinc was a major concern for both caregivers and providers. The pricing of zinc needs to be revised, particularly relative to other treatment products.

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**USAID**  
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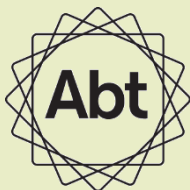


Strengthening Health Outcomes  
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