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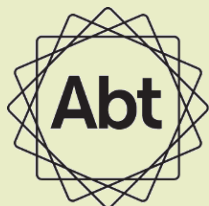


Strengthening Health Outcomes  
*through* the Private Sector

# Can Mobile Phone Messages to Licensed Chemical Sellers Increase Recommendation of ORS and Zinc?

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Making Impact Evaluation Matter: Better Evidence for Effective Policies and Programmes  
September 4, 2014



**SHOPS is funded by the U.S. Agency for International Development.**  
**Abt Associates leads the project in collaboration with**  
Banyan Global  
Jhpiego  
Marie Stopes International  
Monitor Group  
O'Hanlon Health Consulting

# Outline

- Rationale
- Research Questions/Theory of Change
- Methods
- Results
- Conclusions

# Rationale

# Rationale

- Diarrhea is a major killer of children in developing countries and the third leading cause of child death in Ghana.
- ORS and zinc are best for management of uncomplicated childhood diarrhea, but antimicrobials are often used unnecessarily.
- This study examines whether a mobile phone text message (SMS) intervention intended to reinforce messages from a training in Ghana changed private provider behavior related to recommendations of ORS, zinc, and antimicrobials
- Increased interest in mhealth, but evidence base is scant

# Research Questions/ Theory of Change

# Research Questions

- Does an SMS intervention lead to increased recommendation of ORS and zinc and decreased recommendation of antimicrobials and antidiarrheals among licensed chemical sellers (LCS)?
- If the intervention is not effective at changing recommendations, what are some possible explanations?

# Licensed Chemical Sellers in Ghana

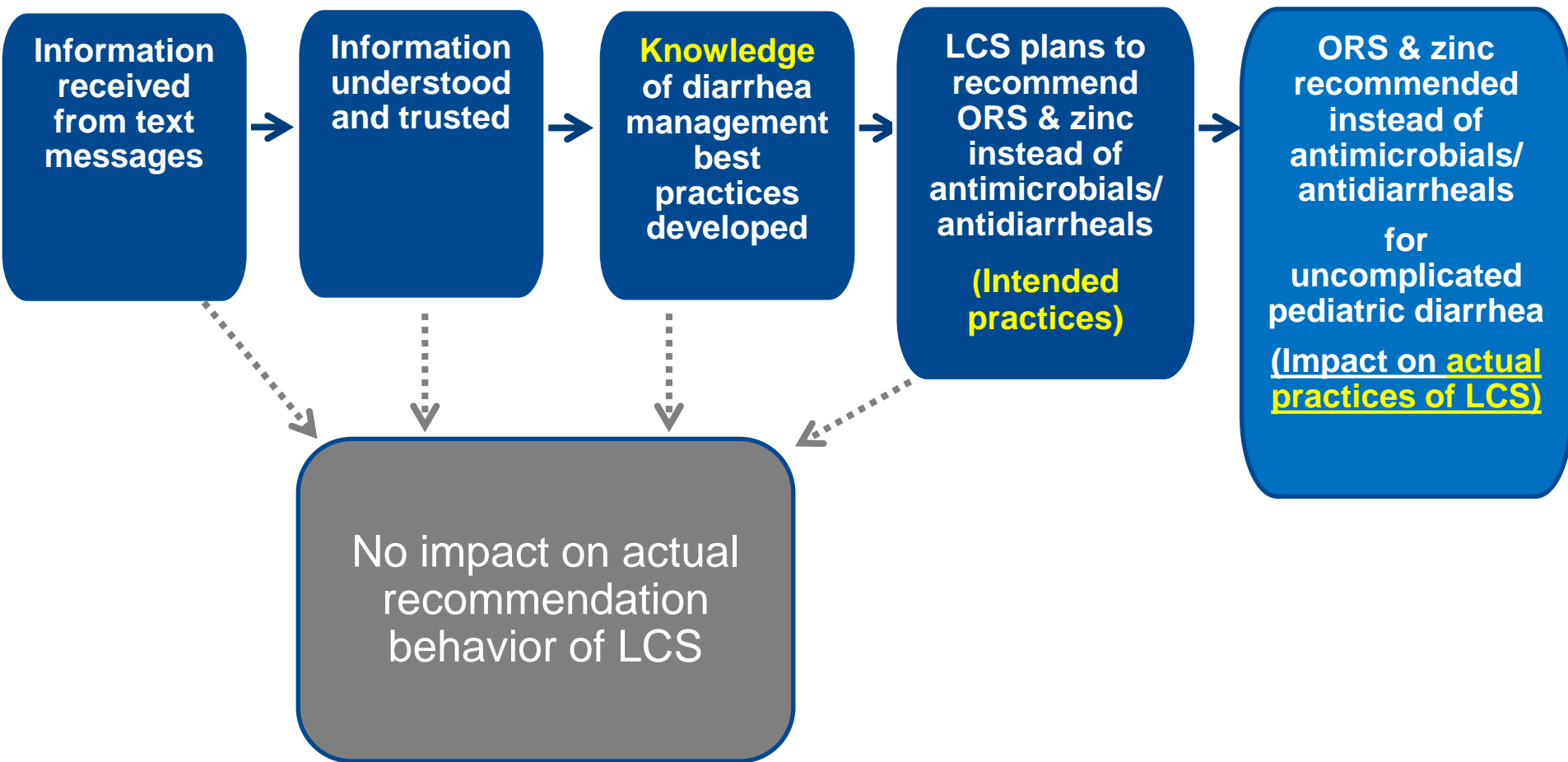


# SMS Intervention – Example of a Quiz





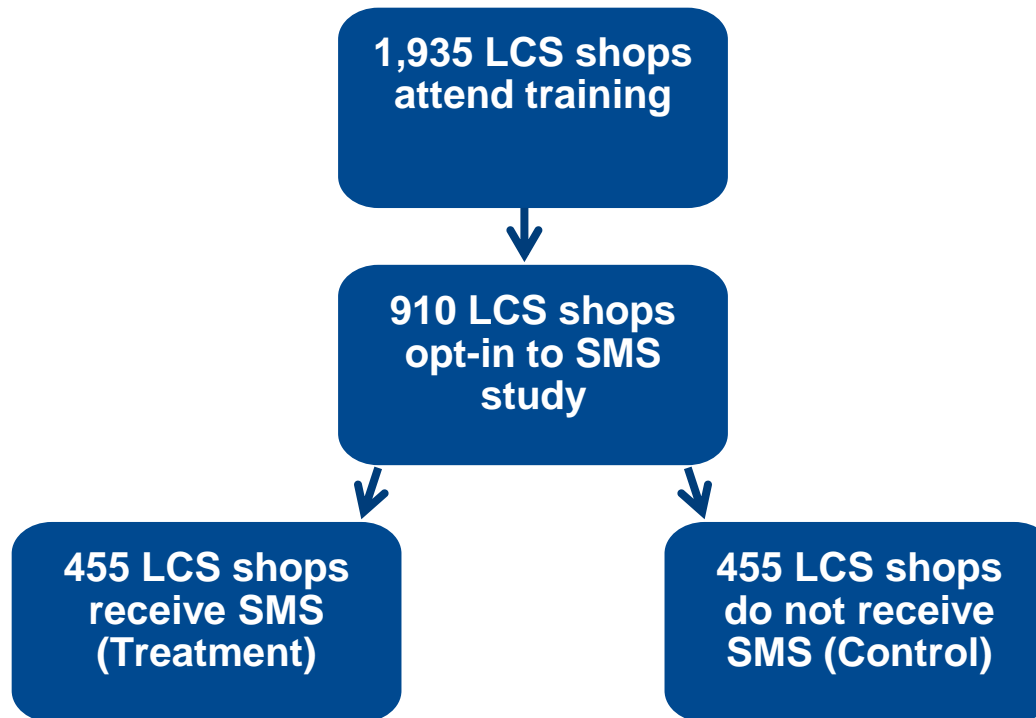
# Hypothesized Chain of Causality



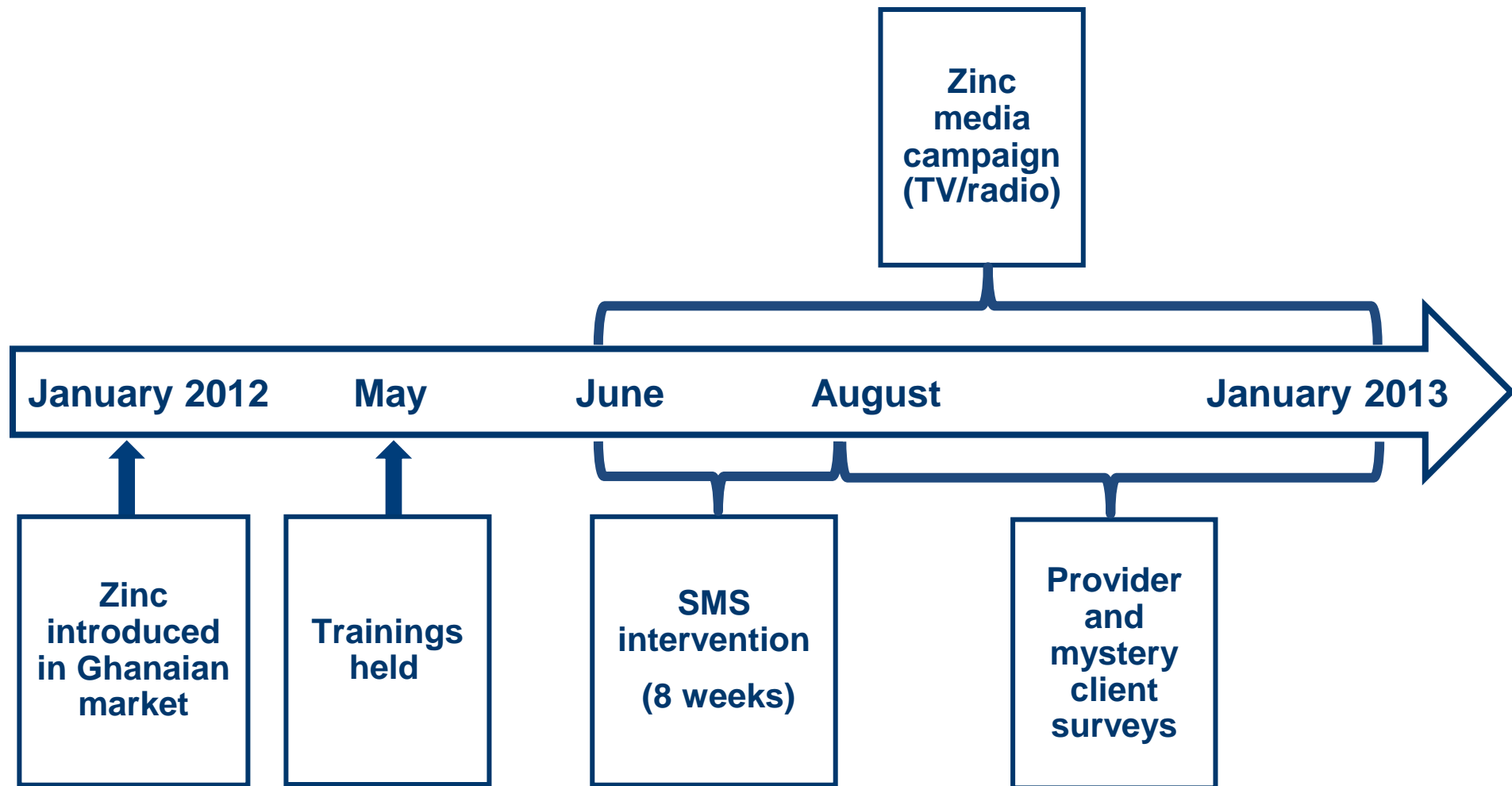
# Methods

# Study Design

All LCS and their assistants in 26 districts in Greater Accra, Central, and Western regions invited to attend training in May 2012



# Intervention and Evaluation Timeline



# Ghana LCS Zinc Interventions

Intervention	Treatment Group	Control Group
In-person training on diarrhea management	✓	✓
Media campaign	✓	✓
SMS intervention to reinforce messages from in-person training	✓	



# SMS Intervention

- SMS messages started immediately after trainings in June 2012
- Sent 3 times a week for 8 weeks and included relevant information and quizzes
- SMS covered information about diarrhea and dehydration symptoms, ORS and zinc guidelines, and discouraged antimicrobial use

# Data: Mystery Client and Provider Surveys

- Mystery client survey
  - Conducted before provider survey
  - Woman poses as mother of child with uncomplicated diarrhea
  - Measures actual LCS behavior and treatments sold
- Provider survey
  - Interview scheduled in advance
  - Measures knowledge, reported behavior, and whether zinc in stock

For both surveys, the interview was conducted with the first person encountered in the shop, not necessarily the person who went to the training.

# Sample Size

## LCS Shops by Treatment Assignment

	Treatment	Control	Total
Attended training and opted-in to intervention (total sampling frame)	455	455	910
Interviewed for both mystery client and provider surveys	354 (78%)	345 (76%)	699 (77%)



# Estimation Strategy

- ITT using OLS
- $Y_{ij} = \beta_0 + \beta_1 Treat_j + \beta_2 X_{ij} + e_{ij}$
- $X$  is a vector of variables including age, experience, sex, education, position in shop (owner or assistant), urban-rural status, and date of interview

# Results

# Treatment and Control Groups are Similar

Background Characteristics	Treatment Group Mean	Control Group Mean	Difference Coeff.	SE
Age	39.4	39.6	-.193	1.191
Male	.602	.593	.009	.037
Post-Secondary Education	.760	.764	-.004	.032
Years of LCS shop experience	9.4	8.7	.665	.616
Person interviewed is LCS	.528	.500	.028	.037
Urban	.502	.565	-.062*	.037
Total observations (n)	354	345	699	

\* $p \leq 0.1$ ; \*\* $p \leq 0.05$ ; \*\*\* $p \leq 0.01$

# Fail to Detect Impact of Intervention on Actual Behavior (Mystery Client Survey)

Outcomes	Treatment Mean	Control Mean	OLS (SE)	OLS (with controls) (SE)
Recommended ORS + Zinc only (ideal)	.388	.405	-.017 (.037)	-.023 (.037)
Recommended ORS	.807	.785	.021 (.030)	.015 (.031)
Recommended Zinc	.657	.660	-.003 (.035)	.0008 (.036)
Recommended Antimicrobials	.461	.495	-.033 (.037)	-.029 (.038)
Recommended Antidiarrheals	.121	.104	.017 (.024)	.021 (.024)
Total observations (n)	354	345	699	699

\*p ≤ 0.1; \*\*p ≤ 0.05; \*\*\*p ≤ 0.01

Why did we fail to detect an impact of SMS on actual behavior?

# Fail to Detect a Large and Statistically Significant Effect on Provider Knowledge (Provider Survey)

	Treatment Mean	Control Mean	Difference in Means	SE
Diarrhea management knowledge score	4.33	4.28	.05	.084
Zinc-specific knowledge score	4.88	4.79	.09	.138
Dehydration symptoms knowledge score	1.33	1.24	.08	.078
Diarrhea severity symptoms knowledge score	2.47	2.35	.12	.080
Total knowledge score (maximum of 22 points)	13.03	12.68	.34	.276
Total observations (n)	354	345	699	

\* $p \leq 0.1$ ; \*\* $p \leq 0.05$ ; \*\*\* $p \leq 0.01$

# SMS Has Positive Impact on Reported Practices (What LCS Recommend Most Often According to Provider Survey)

Outcome	Treatment Mean	Control Mean	Difference Coeff.	SE
Ideal reported practice (ORS & zinc only)	.774	.707	.066**	.033
ORS	.903	.886	.016	.023
Zinc	.807	.765	.042	.030
Antimicrobials	.059	.115	-.056***	.021
Antidiarrheals	.008	.023	-.014	.009
Total observations (n)	354	345	699	

\*p ≤ 0.1; \*\*p ≤ 0.05; \*\*\*p ≤ 0.01

# Differences between Reported (Provider Survey) and Actual Behavior (Mystery Client Survey)

		Reported behavior mean	Actual behavior mean
ORS	Treatment	.903	.807
	Control	.886	.785
Zinc	Treatment	.807	.657
	Control	.765	.660
Antimicrobials	Treatment	.059	.461
	Control	.115	.495
Antidiarrheals	Treatment	.008	.121
	Control	.023	.104
Total observations (n)			699



# Possible Reasons for Differences in Reported and Actual Behavior

- Perceived consumer demands
  - 25% of LCS reported that some caregivers refuse to buy ORS
  - 12% of LCS report that some caregivers refuse zinc
  - Treatment most commonly requested by caregivers is antimicrobial Flagyl (metronidazole), reported by 33% of LCS as a commonly requested drug
- Profit motives
  - Both antidiarrheals and antimicrobials are more profitable than zinc or ORS by roughly 0.50 - 1 USD per typical course used

# Conclusions

# Conclusions

- Programmatic
  - mHealth is a low-cost promising intervention
  - Impact on reported behavior – step in the right direction
  - Perceived consumer demands and the profit motives may be barriers
  - SMS was one component of a larger intervention – less room for improvement
- Methods
  - Important to measure actual behavior through means such as mystery client surveys as there may be differences between actual and reported behavior



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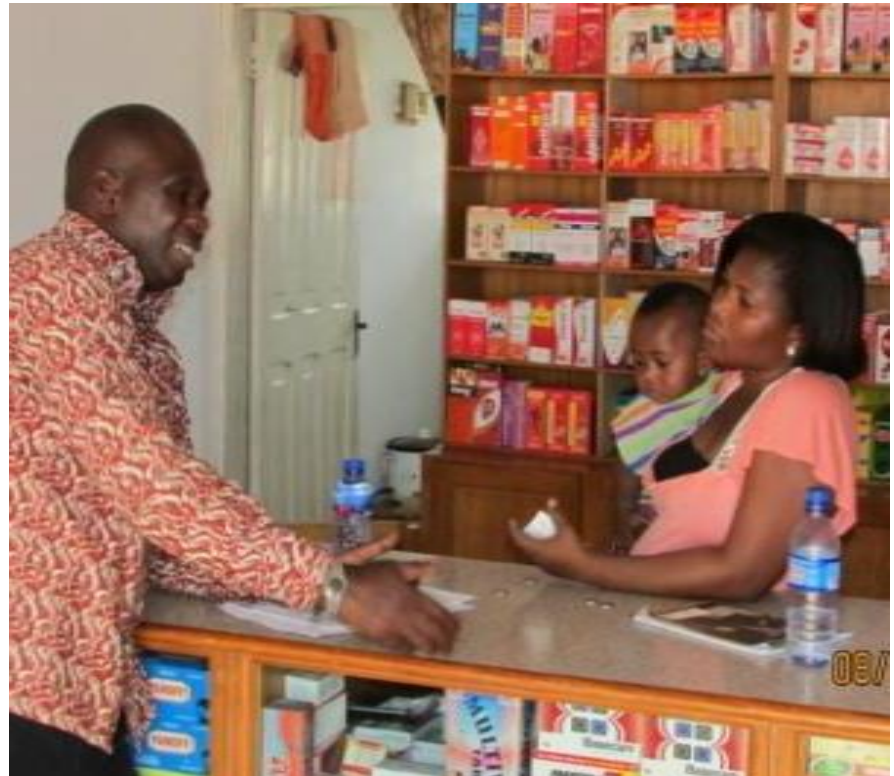
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# Research into Practice

- Supportive supervision introduced to address the identified gaps
- Integrated into scheduled inspections of Pharmacy Council, a statutory regulatory agency
- Offers on-site training of providers
- Use of smartphones



# Research into Practice

- Addressing stock-outs on weekly basis

*Zinc availability in retail outlets increased by 20%*

- Improved rapport between Pharmacy Council and OTCMS

*Increased number of visits from 5,000 to 11,000/year*

- Use of data to identify training needs, inform training content, follow-up activities, policy issues, etc.

