





## Background

Diarrhea is a leading cause of death for Children Under Five Years Old (CUFYO) worldwide. Mali has the second highest diarrhearelated case fatality rate among African countries. The World Health Organization's (WHO) Integrated Management for Childhood Illness handbook provides recommendations for diagnosis and management of acute watery diarrhea (AWD) in low-resource settings, including: increased fluids, continued feeding, zinc, and antibiotics for dysentery. The 2018 Malian Demographic and Health Survey noted low rates of rehydration and zinc use. This study aimed to evaluate how provider knowledge, beliefs, and practices (KBPs) align with WHO recommendations in Mali.

## Methods

- Study type: Qualitative cross-sectional interviews
- Participants: 137 providers who manage diarrhea in CUFYO in Bamako, Mali from July - August 2017.
- Provider types: doctors (D), pharmacists (P), market vendors of allopathic medications (MV), traditional healers (TH), and vendors of traditional medicines (TV).
- Participant selection: randomly selected by commune in Bamako
- Interview structure: Participants were presented with scenarios depicting diarrheal syndromes and asked to provide a diagnosis, perceived etiology of illness, management recommendations, and KBPs regarding IMCI recommendations. Focus groups were used to generate survey questions.
- Statistical analyses were performed using chi-squared and Fischer extract tests in SAS.

## Results

- **DIAGNOSIS:** 46% of providers offered the WHO definition of AWD. There was significant difference in provider diagnosis of AWD (P > D > TH > TV > MV; p = 0.0001) and Dysentery (P >TV > D > TH > TV > MV; p = 0.0024).
- **TREATMENT:** Participants insufficiently volunteered recommended treatment of AWD with ORS (D > P > MV; TH & TV did not), and to a lesser degree zinc (D > P; MV, TH, & TV did not). D, P, & MV offered inappropriate use of antibiotics for AWD (25% total). When directly prompted 74% of all providers recommended increasing fluids, 59% continued feeding, 68% continued breastfeeding. There were significant differences among provider types and treatment provisions (ORS, p = 0.0001; zinc, p = 0.0034; antibiotics, p = 0.0001; traditional medicines, p = 0.0001). There was also a significant difference in provider treatment by child sex among TH and TVs.
- DANGER SIGNS: While most providers reported at least one WHO-cited danger sign associated with AWD, only 42% of providers identified dehydration and 18% mortality as possible sequelae. There was a significant difference among providers reporting dehydration as a concerning symptom (D > P > MV >TV > TH; p = 0.001).
- **PERCEIVED ETIOLOGY:** Providers offered explanations for AWD etiologies, grouped as: Biological (infection, hygiene, environmental) or Cultural (specific foods, normal development, perceived social or maternal wrong-doing). Perceived biological etiology was associated with citing the WHO definition of AWD (p = 0.039), recommending ORS (p = 0.001), and provider type (D > P > MV > TH > TV; p = 0.0003).

# **IDENTIFICATION & MANAGEMENT OF DIARRHEA IN CHILDREN UNDER FIVE IN BAMAKO, MALI**

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Increased fluids (specifically ORS), continued feeding, and zinc supplements are the WHO recommendations for AWD treatment for CUFYO.



Vending allopathic medications in the market is illegal in Mali.



A traditional healer recommends a treatment based on traditional practices, and is eligible to apply for a professional "therapist" card (above) from the Department of **Traditional Medicine. Some are** members of professional associations which collaborate with the WHO.

Provider identification and management of diarrheal syndromes in children under five in Bamako, Mali remain largely inconsistent with guidelines provided by the WHO. Care varies by provider type, perceived etiology, and child sex.



# **Conclusions:**









Fatim Sogodogo interviews a Vendor of Traditional Medicines (bundles of medicinal plants are behind them). A traditional vendor is analogous to a pharmacist of traditional medicines they are not considered healers eligible for a "therapist" card.



*Euphorbia hirta* was studied by the **Department of Traditional Medicine** (a branch of the Ministry of Health in Mali). It is approved for AWD and sold in pharmacies as Dysenteral.

This includes nine 10g doses of dried leaf powder. Each dose is boiled in 500 mL of water to create a solution for a CUFYO to drink.

<b>Table 1: Provider Demographics</b>						
	Doctor	Pharmacist	Market Vendor	Traditional Healer	Traditional Vendor	Mean
Age, years median [IQR]	35 [8]	32 [19]	31 [15 ]	62 [15]	49 [22]	44
<b>Gender</b> Female, n (%)	6 (21)	6 (25)	23 (89)	24 (86)	28 (93)	17 (64)
<b>Religion</b> Muslim, n (%)	27 (93)	23 (96)	24 (92)	28 (100)	29 (97)	26 (96)
<b>Ethnicity</b> Bamana, n (%)	11 (38)	7 (29)	8 (31)	20 (71)	20 (67)	13 (48)
<b>Language</b> Bamana, n (%) French, n (%)	29 (100) 24 (83)	24 (100) 24 (100)	26 (100) 3 (12)	28 (100) 5 (18)	30 (100) 1 (3)	27 (100) 11 (42)
Education Primary, n (%) Secondary, n (%) University, n (%) Graduate, n (%) Islamic, n (%)	$\begin{array}{c} 0 \ (0) \\ 2 \ (7) \\ 3 \ (10) \\ 24 \ (83) \\ 0 \ (0) \\ 0 \ (0) \end{array}$	$ \begin{array}{c} 1 (4) \\ 10 (42) \\ 5 (21) \\ 8 (33) \\ 0 (0) \\ 0 (0) \end{array} $	5 (19) 2 (8) 2 (8) 0 (0) 6 (23) 11 (42)	4 (14)  0 (0)  1 (4)  0 (0)  3 (11)  20 (71)	2 (7) 2 (7) 0 (0) 0 (0) 7 (23) 19 (63)	2 (9) 3 (12) 2 (8) 6 (23) 3 (11) 10 (35)
Employment Self, n (%) Private, n (%) Other, n (%)	1 (3) 10 (35) 18 (62)	4 (17) 20 (83) 0 (0)	26 (100) 0 (0) 0 (0)	28 (100) 0 (0) 0 (0)	29 (97) 0 (0) 0 (0)	18 (64) 6 (22) 1 (14)
Total, n (%)	29 (21)	24 (18)	26 (19)	28 (20)	30 (22)	137

## Table 2: Acute Watery Diarrhea: Diagnosis, Etiology & Management by Provider Type

	Ethology, & Management by Howder Type						
	D (%)	P(%)	MV (%)	TH (%)	TV (%)	Total (%)	p-value
WHO –	80	95	29	77	73	70	0.0001
Diagnosis							
WHO -	72	67	32	40	18	46	0.0001
Definition							
Biological	88	79	63	41	36	60	0.0003
Etiology							
<b>Treatment:</b>	64	33	10	0	0	20	0.0001
ORS							
Treatment:	20	6	0	0	0	5	0.0034
Zinc							
Treatment:	24	44	71	0	0	25	0.0001
Antibiotics							
Treatment:	0	0	10	100	100	48	0.0001
Traditional							
Medicine							
Treatment	0	0	0	57	79	29	0.0001
varies with							
Child Sex							

## Table 3: Dyset

	D (%)	<b>P(%)</b>	MV (%)	TH (%)	TV (%)	Total (%)	p-value
WHO -	54	79	44	40	57	54	0.0024
Diagnosis							
<b>Treatment:</b>	77	73	83	0	0	34	0.0001
Antibiotics							



# Acknowledgements

Lamine Mariko, BA; Fatoumata Sogodogo, BA; Modibo Keita, MA; Ballan Sangare, BA; Kounandji Diarra, MA; Rokia Dembele, NP; Uma Onwuchekwa; Anna Roose, MPH; Doh Sanogo, MD; Diakarida Sidibe, MD; Brehima Coulibaly, MD; Mahamadou Lamine Bagayoko, MA; Juan Lin, PhD; Elie Schoenbaum, MD; Kunandji Diara, MA; Rebecca Perkins, MD; Olivera Vragovic, MBA Sponsored by: The Center for Vaccine Development- Mali; IDSA Education and Research Foundation Medical Scholarship, ASTMH Benjamin H. Kean Travel Fellowship in Tropical Medicine, Alpha Omega Alpha Carolyn L. Kuckein Student Research Fellowship, Albert Einstein College of Medicine Research Fellowship.

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ntery: Diagnosis &	Treatment by Provider Type

