End-line Survey on Scaling up the Use of Zinc and Oral Rehydration Salts (ORS) in the Treatment of Diarrhoea among the 6-59 Months Children to Reduce Child Morbidity and Mortality in Bangladesh

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Micronutrient Initiative (MI), Bangladesh demonstrated a model with promising result to improve child survival through strengthening zinc supplementation and ORS distribution in the treatment of diarrhoea in children 6-59 months. Currently, MI is scaling up the best practices of the demonstration program in 9 districts in request of Primary Health Care under Directorate General of Health Services. Three out of these first year nine scale up project districts are being evaluated using a pre and post intervention survey design with comparison districts. A baseline survey of the program has been undertaken in early 2015 in 3 intervention districts (Kishorejganj, Bogra and Patuakhali) and three comparison districts (Brahmanbaria, Noagaon and Pirojpur). Now, MI has commissioned an 'End-line Survey on Scaling up the Use of Zinc and Oral Rehydration Salts (ORS) in the Treatment of Diarrhoea among the 6-59 Months Children to Reduce Child Morbidity and Mortality in Bangladesh' in those districts which has been undertaken by Human Development Research Centre (HDRC).

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ABBREVIATIONS

AHI	Assistant Health Inspector
BCI	Behaviour Change Intervention
CC	Community Clinic
CHCP	Community Health Care Provider
CS	Civil Surgeon
DCI	Data Collection Instrument
DDFP	Deputy Director of Family Planning
DGHS	Directorate General of Health Services
FPI	Family Planning Inspector
FWA	Family Welfare Assistant
FWV	Family Welfare Visitor
GoB	Government of Bangladesh
HA	Health Assistant
HH	Household
HI	Health Inspector
HSC	Higher Secondary School Certificate
IMCI	Integrated Management of Childhood Illness
IPC	Inter Personal Communication
IRB	International Research Bureau
KAP	Knowledge, Attitude and Practice
MI	Micronutrient Initiative
ORS	Oral Rehydration Salt
PHC	Primary Health Care
SACMO	Sub-assistant Community Medical Officer
SMS	Short Message Service
SSC	Secondary School Certificate
UFPO	Upazila Family Planning Officer
UH&FPO	Upazila Health and Family Planning Office
UHC	Upazila Health Complex
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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Executive Summary

Background

In the context of high Infant and Under Five Mortality Rate, Micronutrient Initiative (MI), Bangladesh demonstrated a model for strengthening zinc supplementation and ORS distribution in the treatment of diarrhoea in children 6-59 months to improve child survival. In view of the promising results of the demonstration program, MI is scaling up the best practices of the demonstration program in additional districts in request of Primary Health Care under Directorate General of Health Services (PHC, DGHS). The scale up program will be implemented in 27 districts in a phased manner with nine districts being initiated in the first year of the program. Three out of these first year nine scale up project districts are being evaluated using a pre and post intervention survey design with comparison districts to allow for maximum program exposure. A baseline survey of the programme has been undertaken in early 2015 in three intervention districts (Kishorejganj, Bogra and Patuakhali) and three comparison districts (Brahmanbaria, Noagaon and Pirojpur). Now, an end-line survey with key objectives to measure the knowledge, attitude and practices (KAP) regarding childhood diarrhea management in those three intervention and three comparison districts has been commissioned by MI (currently Nutrition International) and been undertaken by Human Development Research Centre (HDRC).

The specific objectives of the end-line survey are to:

1. Estimate coverage and compliance of Zinc supplementation with ORS during diarrhoea episodes of children 6-59 months of age
2. Assess the knowledge, attitude and practices among mothers and health workers in treatment of childhood diarrhoea; and
3. Assess the knowledge, skill and behavior of heath service providers related to services and advice provided to caregivers of 6-59 months old children suffering from diarrhoea.

Methodology

The current study is for end-line estimates of a quasi-experimental pre and post-intervention repeated cross sectional survey design for collecting quantitative data. The study was conducted in three purposively selected MI Intervention districts together with three comparison non-project districts adjacent to the selected program districts having similar socio-economic and health characteristics. In order to compare findings from baseline and end line data, the sample size, sample locations (District, Upazila, Union) and sample selection strategy during end line was identical to the baseline.

Tabulation for quantitative data analysis techniques mostly includes uni-variate analysis and bi-variate analysis. The quantitative analysis was summarized by districts and intervention-Control groups. Difference-in-difference (DiD) technique was applied to assess the net impact of project intervention. Also statistical tests (hypothesis testing) were performed to assess significance of the changes. Qualitative interviews were scripted and then content analysis was performed. Necessary triangulations were also performed.

Study Findings

Background situation of mothers/caregivers

Household characteristics: Around one-fourth household members are below 5 years age, with mean age of the under-five children 30 months. More than two-fifth of the household members are under 18 years. Among the household members, almost half are married, and of the rest, 47 percent are unmarried, and 2 percent widow/widower. The average monthly household income is Taka 12,475 in intervention and Taka 13,143 in comparison area. Main sources of household income are- day laborer, followed by agriculture and business. Main source of drinking water is tube-well in more than 90 percent households.

Education, Exposure to media, and Membership with credit group: More than 85 percent mothers/caregivers have certain level of education, and 43 percent have education up to secondary level. However, educational levels of husbands are lower than wives.

Around half of the mothers/caregivers watch television. Among those, more than 80 percent watch drama/serial and cinema. Radio is not popular. Only 3 percent mothers/caregivers in intervention and 9 percent in comparison areas use internet. Among the internet users, almost all use social media site, of which 50 percent use *Facebook*, followed by *Google*. Only 5 percent in intervention and 17 percent in comparison areas use SMS services in their mobile phones. And, only 9 percent household members have affiliation with microcredit organizations, such as- ASSA, Grameen Bank, and BRAC.

Findings of the KAP survey with mothers/caregivers

Diarrhoeal episode in under-five children: Similar to the baseline, majority (95%) of under-five children in intervention and comparison areas have only a single episode of diarrhoea during last 30 days. However, the days of sufferings on an average are 3.6 days in intervention and 3.1 days in comparison areas at the end-line.

Understanding on concept of diarrhea: Concept of diarrhea (loose or liquid stools at least 3 times per day) is correctly known to 50 percent mothers/caregivers in intervention and 44 percent in comparison area, with net change 3.8 percentage points.

Knowledge about ORS and its source: All the mothers/caregivers are aware of ORS. However, around 30 percent still can't explain the method of ORS preparation. In public sector, Community Clinic (CC) is the primary source of ORS known to most of them in intervention (66%) and comparison (73%) areas. In private sector, *gram daktar* (village doctor) with pharmacy is the most popular source of ORS in intervention (75%) and in comparison (69%) areas during the end-line.

Knowledge about zinc and its source: Knowledge of the mothers/caregivers about zinc is fairly high at intervention (76%) than in comparison (44%) areas during end-line. It was lower at the baseline. The net change in this regard is 37.6 percentage points. And, the major known source of zinc known to them in public sector is CC (74.4% in intervention and 71.3% in comparison areas). In private sector, *g*ram daktar with pharmacy is the major source of zinc known to them (69.3% in intervention and 35.6% in comparison areas).

Knowledge about duration of treatment with zinc: During the end-line, 40.4 percent mothers/caregivers in intervention and 23.4 percent in comparison areas reported correctly that, zinc is to be given for 10 days or more. The net change in this regard is 23.7 percentage points.

Consultation for treatment of acute diarrhoea of under-5 children: During the end-line, 35.3 percent mothers/caregivers in intervention sought treatment from public sector, and 61.3 percent from private sector for treatment of acute diarrhoea of their under-5 children. However, excluding *g*ram daktar the private sector figure comes down to 23.2 percent, as 42.3 percent sought treatment from gram daktar.

Prescription for treatment by service providers for acute childhood diarrhea: Practice of advising to take both zinc and ORS with or without other medicine by service providers for treatment of acute diarrhea in children is 70.9 percent in intervention, and 37.0 percent in comparison areas, which were much lower at baseline.

Coverage of zinc and ORS: During end-line, 67.8 percent mothers/caregivers in intervention areas reports receipt of zinc and ORS from any source for treatment of acute diarrhea in children, of which 38.1 received from public sources and 55.2 from private sources. Coverage was much lower (27.6%) during baseline.

Adherence to giving zinc tablet by caregivers for 10 days: During end-line, 70.1 percent mothers/caregivers receiving zinc tablets from any sector reports giving it for 10 days for treatment of acute diarrhea in children in intervention areas. The same was 20.2 during baseline. Among those receiving zinc tablets from public sector 77.1 percent intervention areas reports giving it to their children for 10 days, which was only 21.1 percent during baseline.

Adherence to giving zinc (tablet or syrup) by caregivers for 10 days: During end-line, 53 percent mothers/caregivers receiving zinc from any sector reports giving it for 10 days for treatment of acute diarrhea in children in intervention areas. The same was 21 during baseline. Among those receiving zinc tablets from public sector 71.2 percent in intervention areas reports giving it to their children for 10 days, which was only 19.4 percent during baseline.

Adherence to recommended dosage: During end-line, 64.2 percent mothers/caregivers receiving zinc tablet and ORS from any sector reports giving zinc tablets for 10 days and 2 sachets of ORS for treatment of acute diarrhea in children in intervention areas. The same was 20.9 percent during baseline. Among those receiving zinc tablets and ORS from public sector 71.9 percent in intervention areas reports following this dosage, which was only 19.4 percent during baseline.

Place of collection of ORS: Private sector (75%) is still the most popular place for ORS collection to the mothers/caregivers as compared to public sector (39%), specially, *gram daktar* with pharmacy in intervention (52%) and in comparison areas (31%). In public sector, CCs are most popular (26%).

Place of collection of zinc tablet and/or syrup: Mothers/caregivers mostly collect zinc tablet from Community Clinic (64%), and syrup from *gram daktar* with pharmacy (61%) in intervention areas.

Counseling: According to mothers/caregivers, 66 percent of them in intervention and 33 percent in comparison areas they have been counseled by health workers to use zinc and ORS.

Findings of Interviews with Health Workers

Two-thirds of the health workers are female. A high proportion of them (above 35%) are master degree holders. More than 50 percent of them received basic training more than 5 years back. Around 80 percent health workers in intervention and 9 percent in comparison areas report receipt of training on use of zinc for treatment of acute diarrhea in children from Integrated Management of Childhood Illness (IMCI) programme of DGHS, or MI. Around 79.8 percent health workers in intervention and 72.9 percent in comparison areas can spell out correctly that passage of at least three loose stools per day is diarrhea.

Knowledge on zinc supplement: The important advantages of giving zinc in acute diarrhoea in children are pronounced more than 80 percent service providers in intervention and a lower proportion in comparison areas. Around 91 percent health workers in intervention and 81 percent in comparison areas reports knowing the recommended dose of zinc for children aged 6-59 months. It was much lower during baseline. A 95 percent service providers in intervention and 70 percent in comparison areas knows correct duration of using zinc (10-14 days). Around 82 percent health workers in intervention and 61 percent in comparison areas were able to demonstrate the procedure of using dispersible zinc tablet correctly.

Practices of prescribing zinc and ORS in management of childhood diarrhoea: A 73 percent of health workers in intervention and 46 percent in comparison areas claims prescribing both zinc and ORS for management of childhood diarrhoea, which was lower at baseline.

Adequate stock of zinc and ORS at present: A 54 percent health workers in intervention and 49 percent in comparison areas report that they have adequate stock of ORS and zinc at present.

Knowledge on estimating demand of zinc and ORS: A 22 percent health workers in intervention and 31 percent in comparison areas report that they know how to estimate the demand of zinc and ORS in their area. However, 51 percent in intervention and 21 percent in comparison areas can demonstrate the procedure of calculation of it correctly.

Household visit made by health workers: Overall, 54 percent health workers during end-line reports that have claims visiting the houses of children during diarrhoea. However, the mothers/caregivers report that none of them visited their houses during that period.

Conduction of group counseling session: The health workers report that, 88 percent of them in intervention areas and 60 percent in comparison areas are conducting group counseling sessions with the mothers/caregivers. Overall, 98 percent health workers in intervention and 68 percent in comparison areas have discussed the benefit of zinc in group counseling session in the last month.

Findings of Interviews with Health Supervisors

Health supervisors are dominated by females aged 45 years or more. A 94 percent health supervisor in intervention and 61 percent in comparison areas during end-line reports of their awareness about the use of zinc and ORS in the management of childhood diarrhea. Overall, 72 percent of them in intervention and 31 percent in comparison correctly know the dosage of 20 mg zinc tablet daily, and 94 percent in intervention and 46 percent in comparison areas know of correct duration of zinc tablet intake for 10-14 days. The health supervisors on an average report of undertaking at least one visit per month for supervision of use of zinc and

ORS in the management of diarrhea in under-5 children, around 84 percent of them use checklist during such supervision. Around 52 of supervisors in intervention and 42 percent in comparison areas report receiving complete monthly report/HMIS on use of zinc and ORS for diarrhea of under-5 children on time. In order to improve coverage and compliance of zinc and ORS, the health supervisors suggest having adequate supply of zinc tablets and ORS in all health facilities and health posts, and good counseling and clear information to the patients on benefit, dose, and administration of zinc and ORS.

Findings of Interviews with *gram daktars (Village doctors)*

As high as 99 percent of the *gram daktars* in intervention and 88 percent in comparison areas perceived diarrhoea as at least three loose stools per day. However, 79 percent in intervention and 52 percent in comparison areas are aware of correct dose of zinc supplement (20 mg/day), and 84 percent in intervention and 41 percent in comparison areas are aware of correct duration of intake of zinc tablet for 10-14 days. Overall, 91 percent *gram daktars* in intervention and 50 percent in comparison areas can demonstrate preparation method of dispersible zinc tablet correctly. In general, 65 percent *gram daktars* in intervention and 36 percent in comparison areas have prescribed both zinc and ORS with or without other medicines. In order to improve coverage and compliance to use of zinc they suggest to-establish a good relation with the mothers/caregivers, provide zinc tablets and ORS to all health facilities, provide adequate counseling to the mothers/caregivers on dosage, use, benefits and administration of zinc and ORS, and follow up home visits.

Findings of Interviews with Health Managers

According to the health managers, total success of the programme is largely dependent on appropriate training of the frontline workers on zinc and ORS. According to them, the role of counseling by the frontline workers is very much effective. However they admitted that, none of the health managers is involved in monitoring of the MI initiated programme on scaling up the use of zinc and ORS in the treatment of diarrhea currently, and there is no special discussion on childhood diarrhea and challenges in providing zinc and ORS to every under 5 child with diarrhoea in the monthly coordination meetings held at UHCs. They also admitted that, they do not have any idea on IEC/BCC materials related to this programme. However, to achieve success in programme implementation they suggest- intensive training of health workers as well as refreshers sessions regularly to provide both zinc and ORS to each under 5 children with diarrhoea; advocacy meeting with the other officials, local govt. representatives, community leaders, and religious leaders; effective and regular monitoring of the programme activities using checklist and other appropriate tools; ensuring adequate supply of zinc and ORS in every CCs, FWCs, and UHCs; establish regular home visit by the health workers and meeting with the mothers/caregivers; and inclusion of NGO health workers in this programme.