Ready to Use Supplementary Foods (RUSF) to prevent stunting among children under five years in Kurram Agency, FATA, Pakistan

Dr Zia Ul Haq,
Director & Associate Prof Institute of Public Health
Outline

• Project staff
• Rationale
• Objectives
• Methodology
• Progress made so far
Project Staff

- **Dr Zia Ul Haq** (IPH-KMU) - Principal Investigator
- **Dr Muhammad Naseem Khan** (IPH-KMU) - (Co Investigator and Project Manager)
- **Dr Muhammad Jaffar Khan** (IBMS-KMU) – (Co Investigator- Lead in Lab)
- **Project Staff:** Mr. Sheraz Khan (Epidemiologist), Dr Shafaat (Agency Coordinator), Mr. Nasir & Tariq (Assistant PM), Mr. Shujaat (Nutritionist), four agency data collectors, Mr. Fazli (database manager)
- **PhD student:** Dr Ijaz (Public Health), Aslam (Biochemistry)
- **Field Staff:** LHW (N=), Data Collectors (n=)
“Service Delivery, Universal Coverage, Public Policy and Leadership REFORMS”

**UHC:** ensuring access to comprehensive services with sufficient quality without financial hardship

**13 Targets – 26 Indicators**
**Baseline and Progress of Pakistan in SDG 3**

- Positive progress in four areas between 2000 and 2015
  - Reduction in maternal mortality - reduced from 294 to 178
  - Skilled birth attendance improved from 23% to 52%
  - Control of malarial infections – 44.8 to 8.56
  - Health emergency preparedness (IHR index – 19 core capacities)

- Progress was slow or stagnant between 2000 and 2015 in
  - Child mortality (under 5 and neonatal)
  - Incidence of Tuberculosis, HIV/AIDS, NCDs, RTA
  - Met need for modern contraceptives
  - Universal Health Coverage

- Regression in child stunting between 2000 and 2015
Anthropometric Definitions of Malnutrition

• **Stunted**: Stunted growth refers to low height-for-age, when a child is short for his/her age but not necessarily thin. Also known as chronic malnutrition, this carries long-term developmental risks.

• **Under-weight**: Under-weight refers to low weight-for-age, when a child can be either thin or short for his/her age. This reflects a combination of chronic and acute malnutrition.

• **Stunted** and **Under-weight** children are most likely to suffer from impaired development and are more vulnerable to disease and illness.

• **Wasted**: Wasted refers to low weight-for-height where a child is thin for his/her height but not necessarily short. Also known as acute malnutrition, this carries an immediate increased risk of morbidity and mortality. Wasted children have a 5-20 times higher risk of dying from common diseases like diarrhoea or pneumonia than normally nourished children.
The Burden

• Nearly half of all deaths under 5 in Asia and Africa

• In Pakistan, 15% children under 5 years are wasted, and nearly 44% are stunted or chronically malnourished

• Vertically transmitted

• We have shown a negligible progress in the recent past
THE LIFETIME COSTS OF STUNTING

CHILD MORTALITY
STUNTED CHILDREN ARE 4x MORE LIKELY TO DIE THAN CHILDREN WHO ARE NOT

IQ SCORES
STUNTING CAN REDUCE IQ BY AS MUCH AS 11 PTS

INCOME
ADULTS WHO ARE STUNTED EARN 22% LESS

ECONOMY
IN COUNTRIES STUNTING CONTRIBUTES TO LOSSES IN GDP AS HIGH AS 16% LIKE ETHIOPIA

http://www.concernusa.org
Challenges in FATA

Stunting rate is higher; 57.6%
Obesity, CVD, Diabetes, Poor Mental Health, Cancer

THE CYCLE OF STUNTING

STUNTED CHILD
UNDERWEIGHT BABY
MALNOURISHED YOUNG GIRL
MALNOURISHED MOTHER
The first 1000 days: a period of rapid growth and development

A window of opportunity to reduce global malnutrition from 162 million to 100 million by 2025
The Response

• Aims to break this inter-generational cycle of stunting

Nutrition-Specific Interventions

Nutrition-Sensitive Interventions

Supplements, School-based feeding, Treating SAM/MAM, Fortification, Feeding Practices

WASH, Agriculture, Livelihood, Cash, Education, Health care, Resilience
Rationale

• Food/nutrient based interventions play key role in multi-sectoral approach to address stunting and chronic malnutrition

• However, evidence regarding the effectiveness of a specific long-term intervention (e.g. supplements) in the prevention of stunting is lacking

• Moreover, Evidence on the effectiveness of combination of nutrition specific & nutrition sensitive interventions (such as food plus cash or livelihood or school-feeding or WASH) is lacking.
Rationale

• Laboratory data on the effect of micronutrients supplementation on plasma micronutrients is scarce.

• Data on the impact of worm infestation on anaemia in FATA?

• Impact on the development of gut microbe in infants and mothers?
Aim

To reduce under-nutrition and break the intergenerational vicious cycle of under-nutrition through targeting the Window of Opportunity

(1000 golden days approach).
Research Objectives

• To study the effectiveness of Lipids based Ready to Use Supplementary foods (RUSF) on pregnancy outcomes (mainly the Low Birth Weight).

• To study the effectiveness of food based nutrition interventions on Stunting prevention.

• To assess the proportional contribution of WFP Livelihood, School feeding, Cash Based transfer, IYCF, and other Nutrition Sensitive interventions (e.g. WASH) in Stunting prevention in the intervention group.
• To investigate the effect of long-term nutritional supplementation on plasma micronutrients.

• To investigate the role of long-term nutritional supplementation on the diversity of gut microbiome and its metabolism in the pregnant and lactating women and children under 5 years of age
Project cost:

• 9 crore (PKR)
• Upper Kurram, FATA

• Year 1: 21,300,000/- (PKR)
• Year 2: 32,400,000/- (PKR)
• Year 3: 35,500,000/- (PKR)

• Funding Agency: Multiple donors through UN- World Food Program, Pakistan

Students

• 2 PhD Scholars (Public Health)
• 1 PhD Scholar (Biochemistry)
• 1 MPH Scholar (Public Health)
• 2 MPhil Scholar (IBMS)
Methodology (multi-design approach)
Intervention Areas

- PLW
  - Pregnant
    - 1st trimester
- Children
  - Lactating women
  - 6-23 months
  - 24-59 months

Control Areas†

Randomization

- Food

Randomization of household in LHW covered/non-covered areas (n=7200 from 80 clusters) assuming 30% non-response

Stratification of health facilities (n=12)

Randomization of health homes (n=80)

Referral of SAM or MAM to the respective health facility

No Food (Soft message and routine care)

Livelihood  Cash  School feeding  WASH
Livelihood

Baseline: Maternal evaluation and Blood and faecal samples

- **Pregnant (1st trimester)**
- **Lactating women**

**Food**

- **6 months:** Maternal evaluation and Blood and faecal samples
- **9 months:** Maternal evaluation and Blood and faecal samples
- **Endline survey***

**School feeding**

6-23 months

- **6 months:** Stunting evaluation
- **12 months:** Stunting evaluation and Blood and faecal samples
- **18 months:** Stunting evaluation
- **24 months:** Stunting evaluation and Blood and faecal samples
- **Endline survey***

**Cash**

- **24-59 months**

**Livelihood**

**WASH**

6 months:

- **Maternal evaluation and Blood and faecal samples**

12 months:

- **Stunting evaluation and Blood and faecal samples**

18 months:

- **Stunting evaluation**

24 months:

- **Stunting evaluation and Blood and faecal samples**

**LHW Non-covered**

6 months:

- **Stunting evaluation**

12 months:

- **Stunting evaluation and Blood and faecal samples**

18 months:

- **Stunting evaluation**

24 months:

- **Stunting evaluation and Blood and faecal samples**

**Endline survey***
Trial registration

ISRCTN registry

View all studies  |  Why register?  |  Register your study

Result: 4 of 16473 results found for

ISRCTN94319790  https://doi.org/10.1186/ISRCTN94319790

Ready to Use Supplementary Foods (RUSF) to prevent stunting among children under five years in Kurram Agency

Condition category
Nutritional,
Metabolic,
Endocrine

Date applied
22/11/2017

Date assigned
11/12/2017

Last edited
05/01/2018

Prospective/Retrospective
Prospectively registered

Overall trial status
Ongoing

Recruitment status
No longer recruiting
Inception ceremony
Coordination with DHS FATA and PMU for initiation of project activities
KMU team visit to Kurram agency for briefing agency surgeon on project activities
October 2017
Clusters identification for study

- Each of the 12 health facilities were visited

- Clusters were formed in the catchment population of each health facility

- Each clusters comprises of 150-170 households

- Total 80 clusters were selected for the project i.e. 40 intervention & 40 control
Training of selected team leaders for the baseline data collection: (2\textsuperscript{nd} week of December)
One day training of the team leaders on the qualitative research and focus group discussion (FGD): 2\textsuperscript{nd} week of December
Execution of the Focus group discussions and in depth interviews at the project areas: (15th -18th December 2017)
Formative research has been conducted which includes: 6 FGDs with community leaders and PLWs and 3 in-depth interviews with key stake holders.
Training of LHWs on the overall data collection and sample identification (17-18 December 2017)
Introduction and grouping of LHWs with the team leaders for execution of baseline study
Daily reporting of the baseline data collection progress.

<table>
<thead>
<tr>
<th>Date of Data collection</th>
<th>Name of Team Leader</th>
<th>Health Facility</th>
<th>Name of cluster</th>
<th>Pregnant woman</th>
<th>Lactating woman</th>
<th>Child 6-18 months</th>
<th>Child 24-48 Months</th>
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<td>23rd Dec 2017 to till date</td>
<td>Tasleema</td>
<td>Boshera</td>
<td>cluster 1-Manakhel, Mola kali, rihmat Malik kali, Zara Boshera (Completed)</td>
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<td>MCH</td>
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</table>
Monitoring data collection process at three different levels

It includes:

• **Data analysts**: Checking baseline data collection form of the team leaders on daily basis

• **Agency level project manager**: Forms before data entry to be checked by the agency level project manager, to be complete and accurate

• **Provincial Level Data manager**:
  Daily data updates and issues in data collection monitoring along with technical support in daily data collection process to the data analysts and agency level project manager. Identification of gaps in data collection and monitoring the role of team leaders and data analysts in baseline data collection process
Blood and fecal sample collection

A total of 1000 blood & stool samples have been collected, 500 each, randomly selected from 7,200 of total sample size.
Baseline data collection progress

• Baseline data collection has been completed in 65 clusters out of the total 80 clusters

• A total of 6000 participants have been recruited and baseline data has been selected
Online data entry software

- Data base with drupal was designed
- Real time data entry (Online)
- Offline data entry (Offline)
Pregnant Women Questionnaire

- To be completed by the interviewer
  - A. Demographics
  - B. Socioeconomic Status of the family
  - C. Multisectoral interventions in the area
  - D. Water, Sanitation & WASH
  - E. Access to health services
  - F. Household Food Insecurity Access Scale (HFIAS) Measurement Tool
  - G. Anthropometric Measurements
  - H. Reproductive characteristics
  - I. 24 Hour dietary recall (All foods and drinks taken in the past 24 hours)
  - J. FAO Dietary diversity Questionnaire (FAO)

Submit
Lab results
• **Progress report of samples processing of stunting project**

• **BLOOD SAMPLES:**

  • CBC of all subjects (1000 samples) are completed.
  • 1000 spare plasma tubes are prepared from EDTA tube.
  • 1000 tubes of packed cells are prepared from EDTA samples.
  • 1000 tube of 200 ul serum are prepared for vit A analysis from Gel tube.
  • 1000 tube of 200 ul serum are prepared for vit D analysis from Gel tube.
  • 1000 tube of 300 ul serum are prepared for Fe analysis from Gel tube.
  • 1000 tube of 300 ul serum are prepared for TRS analysis from Gel tube.
  • 1000 tube of 300 ul serum are prepared for Ferratin analysis from Gel tube.
  • 1000 tube of 300 ul serum are prepared for Zinc analysis from Heprin tube.

• **Next step is the chemical analysis of the above all samples will be started soon.**
• STOOL SAMLES:
  
  • 3000 bijoux tube for short chain fatty acid are prepared for analysis.
  • 3000 screw tube for DNA analysis are prepared.
  • 1000 effendroff, s spare samples are prepared.
  • 200 samples are analyzed for occult blood and parasites.
  
  • Remain samples of stool for occult blood and parasites will be completed in 5 days insha ALLAH.
Summary

• Evidence regarding the effectiveness of a specific long-term intervention (e.g. supplements) in the prevention of stunting which was lacking

• Moreover, Evidence on the effectiveness of combination of nutrition specific & nutrition sensitive interventions (such as food plus cash or livelihood or school-feeding or WASH) is lacking.
Analysis in Progress

To be continued......