

Current Evidence on Improving Nutrition in Pakistan
28 February – 1 March 2017
Islamabad, Pakistan

Summary Report on Event Proceedings



IE AGA KHAN UNIVERSITY



Humanitarian Aid
and Civil Protection



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Introduction

Severe Acute Malnutrition (SAM) is a global public health challenge with an estimated 16 million children aged under five suffering from severe wasting. Annually, about a million deaths among children under five years are attributed to SAM. In 2015 nearly 33.9 million children were wasted in Asia, of which 11.9 million suffered from severe wasting. The 2011 National Nutrition Survey (NNS) of Pakistan reported the national prevalence rate of wasting as 15.1% - the World Health Organization (WHO) threshold for global acute malnutrition (GAM) is 15% - indicating a nutrition emergency in the country. Among all other districts, Sindh specifically has a very high prevalence of GAM, 17.5%, and a recent Multi-Indicator Cluster Survey (MICS) conducted in 2014 documented a 15.4% wasting rate in the province.

Pakistan, along with many other governments, has committed to participating in the United Nations' 17 [Sustainable Development Goals](#) (SDGs), established in 2015. The second of these goals is "[Zero Hunger](#): End hunger, achieve food security and improved nutrition and promote sustainable agriculture." In these last few years, the Government of Pakistan has been especially committed to investing in nutrition, for example, improving the health and nutrition of young infants by nationally implementing the health policy framework for breastfeeding promotion, the [International Code of Marketing of Breast-milk Substitutes](#), promoted by WHO. The Government also includes the right to food, and undernutrition in its national development plans and growth strategies.

Undernutrition in children, however, continues to be widespread in the country. Poverty and food insecurity are at the root of undernutrition in Pakistan, with many poor households not having adequate access to available foods. Research on what works best, and how, in maximising nutritional impact is a crucial step in effectively implementing the very programming that will lead to zero hunger. The Government of Pakistan has already made large strides in investing in nutrition, as have many other organisations in Pakistan working with a mandate to end hunger.

The two-day event, *Current Evidence on Improving Nutrition in Pakistan*, held in the Marriott Hotel in Islamabad, Pakistan, from 28 February – 1 March 2017, convened multiple research projects that have investigated various components of the prevention and treatment of undernutrition in Pakistan. Results from the studies were presented, providing a broad scope of the nutrition research environment in the country, and possible future steps. Participants partook in the discussion of results, as well as provided input into further research and programmes that may be put into place to address undernutrition in Pakistan.

This summary report below gives an overview of the presentations of each panellist, and the questions and discussions emerging from the audience. The full presentations are available in Annex 1. Agenda for the event is found in Annex 2. Finally, a list of those who participated in the event is available in Annex 3.

For additional questions or comments, please contact REFANI@actionagainsthunger.org.

Day One - February 28

Welcome Remarks

Shahid Fazal – Deputy Country Director, [Action Against Hunger](#)

Mr. Fazal opened the day by welcoming everyone to the event, and extending his gratitude to all the participants, donors, implementing partners and the Action Against Hunger team for their presence. He also briefly outlined the research projects which will be presented during the event.

Opening Remarks

Dr. Masood Khawaja – National Coordinator, National Fortification Alliance & Nutrition, [Ministry of National Health Services Regulation and Coordination, Pakistan](#)

Dr. Masood Khawaja began by highlighting the 2011 National Nutrition Survey's high findings of malnutrition in Pakistan from 2010-2011, experienced after heavy floods. Since then, he continued, implementation of nutrition interventions was accelerated in the country, especially in Sindh Province. Dr. Khawaja said that despite putting much effort behind malnutrition programming, poor nutrition indicators can still be seen, perhaps indicating that expected outcomes have not yet been achieved. He suggested that the focus on monitoring and evaluation of programme outcomes should also be considered, for example, conducting impact assessments in addition to the implementation, which may result in the reporting of nutrition outcomes.

Dr. Khawaja further added that the findings from the research presented during this event will surely help evidence-based decision making, which will aid in the scalability of programmes, and the development of appropriate policies.

Key points:

- Since the floods of 2010, Pakistan is still experiencing high levels of malnutrition;
- Monitoring, evaluation and impact assessments should be carried out to gain a deeper understanding of programmatic outcomes; and
- Research in this field is a crucial part in decision-making for programmes and policies.

Bridget Fenn – Principal Investigator, [ENN](#), [Research on Food Assistance for Nutritional Impact \(REFANI\)](#) – (virtual presentation)

Bridget Fenn began her presentation by giving a brief overview of the REFANI Consortium, comprised of Action Against Hunger, [Concern Worldwide](#), ENN and the [University College London \(UCL\)](#). REFANI is a 3-year research project funded by UK aid from the UK government ([DFID](#)), and co-financed through humanitarian aid from the [European Commission](#). The project aims to strengthen the evidence base on the nutritional impact and cost-effectiveness of cash- and voucher-based food assistance programmes, as well as identify the mechanisms through which this effectiveness is achieved, by conducting three country studies, in Pakistan, Niger and Somalia.

Ms. Fenn then spoke specifically to the REFANI-Pakistan study, describing that the study was conducted in collaboration between ENN and Action Against Hunger, aligned with the on-going implementation of the [EU-funded Women and children/infants Improved Nutrition in Sindh \(EU WINS\)](#) programme (provides treatment of severe acute malnutrition and educational programming in nutrition). The study used a mixed methods approach to assess the short and longer-term effectiveness of seasonal cash transfer programmes (CTPs) on the nutritional status of mothers and children. This study aimed to: (a) compare the nutrition status of children receiving seasonal unconditional cash transfers (UCTs), or a fresh food voucher, with those only receiving standard WINS care after six months and at one year; (b) assess the costs and cost-effectiveness of the different interventions; (c) understand the factors that determine the ways in which households use the different transfers; and (d) explore the role of the different processes involved in the study outcomes and how they interact with the context. Ms. Fenn explained that the study was a four-arm longitudinal cluster randomised controlled trial (cRCT), where all beneficiaries in the villages of the study arms had access to the 'standard' WINS programme. Villages were randomised into one of four groups – (1) those receiving WINS standard care only (control); (2) a seasonal UCT ('standard care'); (3) a seasonal 'double' UCT; and (4) a seasonal fresh food voucher.

After explaining the study design, Ms. Fenn provided an overview of the results: at six months, compared to the control group, the 'Double Cash' arm saw a decrease in risk of a child being wasted, an increase in mean weight-for-height-z-score (WHZ) scores and a decrease in risk of a child being severely wasted. Also, compared to the control group, the voucher arm saw an increase in mean WHZ and increase in mothers' body-mass index (BMI), however also observed negative trends: a decrease in mean haemoglobin concentration in mothers and children, and an increase in risk of anaemia in mothers. The only change observed in the 'Standard Care' arm, compared to the control group, was negative; a decrease in mean haemoglobin concentration in mothers. Lastly, all arms saw an increase in household and individual dietary diversity. She continued to explain that these significant impacts on primary outcomes were only observed at the six-month interval. However, at both month six and twelve, all three intervention groups saw lower odds of being stunted, being severely stunted and mean height-for-age-z-score.

Analysis of results is still ongoing, including a pathway analysis into why the 'Double Cash' arm experienced reduction in wasting, and why this arm did not also observe an improvement in haemoglobin status. Further analysis is also being conducted to see what occurred in the voucher arm, considering that there was an increase in WHZ score, yet also a decrease in haemoglobin status.

Key points:

- A larger amount of cash distributed seemed to be the most effective for reducing wasting in poor and very poor households with young children in the short-term only;
- All arms saw a decrease in stunting, both in the short and medium-term, suggesting that these interventions may build greater nutrition resilience over the medium term in poor and very poor households with young children; and
- The voucher arm saw negative impacts in terms of haemoglobin and risk of anaemia, so this modality of CTP may need to be reconsidered in populations with a very high prevalence of anaemia, and/or adding anaemia treatment to the intervention.

Ann Suk

Assessment and Communications Manager, Action Against Hunger, [Evaluation of the Effectiveness of Safe Drinking Water in Community-Based Treatment of Severe Acute Malnutrition](#)

Ann Suk began by giving an overview of the Effectiveness of Safe Drinking Water in Community-Based Treatment of Severe Acute Malnutrition project, a study funded by DFID and [the Wellcome Trust](#), managed by [Enhancing Learning and Research in Humanitarian Assistance \(ELRHA\)](#). Ms. Suk introduced the primary research question: does safe drinking water improve the effectiveness, cost-effectiveness and recovery rate of SAM treatment? The study hypothesises that all three of these areas would improve with the addition of clean water. The study will also evaluate and compare the effectiveness of three Point of Use (PoU) water treatment technologies within a community managed acute malnutrition programme (CMAM). The study used a mixed-methods approach to evaluate the outcomes of different water purification methods for the treatment of SAM. Ms. Suk went on to explain that the study was a four-arm randomised control trial (RCT). Participants were randomised per the SAM treatment site they attended, into one of four groups – (1) Those receiving standard SAM treatment (control); (2) Standard SAM treatment plus flocculant-disinfectant water treatment (Proctor & Gamble Purifier of Water)—PUR; (3) Standard SAM treatment plus chlorine disinfectant (Aquatabs); and (4) Standard SAM treatment plus a ceramic water filter. The study also contained a qualitative data component, which was conducted through interviews and household-level observations.

Ms. Suk then discussed some parts of study implementation, including numbers of participants who were discharged as cured, those who did not complete the study, as well as some operational challenges. The two main operational challenges discussed were: (1) the lack of Pathoscreen pillows in the local market, which was mitigated by using a local alternative; and (2) the high temperatures in the region which dissuaded participants in the Standard SAM treatment/ceramic water filter arm from using the plastic filters. This challenge was ameliorated by advising the participants to use clay pitchers to store the filtered water and keep it cool.

Lastly, Ms. Suk concluded by giving an overview of the timeline for the completion of the project and the potential implications of the results. Analysis of qualitative and quantitative data is currently underway, the costing analysis is complete and the cost-effective analysis is in progress. The results of the study have the potential to provide evidence for the link between safe water treatment and recovery from undernutrition, compare the effectiveness of the three PoU water treatment devices and their use in a CMAM programme, evaluate recovery times, length of stay, and overall design in CMAM treatments.

Key points:

- Most beneficiaries in the study were discharged as cured compared to a non-completion of the study;
- The primary operational issues discussed were related to a lack of available required supplies and issues with functionality of supplies; and

- Study findings will provide evidence about the effectiveness and cost-effectiveness of inclusion of each of the three PoU water treatment devices in SAM treatment.

Overview of Discussion

After both presentations were made, the floor was opened to questions and comments. Ms. Fenn received questions on the REFANI study, for example: cut-off values for haemoglobin, how the transfer amounts were calculated and complementary/supplementary interventions in the area. Ms. Suk received questions regarding: water quality being tested before the intervention, ethical considerations for the control group and plans for applying the study findings to future programming. Both presenters also discussed how the potential for confounding was considered in study designs and during data analysis.

Overall, participants were also interested in discussing the generalisability of the results from these studies, and if/how they can be applied to different contexts: Perhaps the interventions may have been more or less effective in other developing countries. Furthermore, cultural patterns of different societies should be considered, like decision-making by women, women empowerment in general, food choices by households and more. These factors may also change the outcome of interventions. It was also suggested that perhaps this study can bring a new aspect of treatment of water at the household level, rather than just access to water, which is usually the focus. Furthermore, participants discussed about the inclusion of behaviour change communication (BCC) into the research and the potential for BCC to drive positive health behaviours. The BCC strategy was discussed, including its development through a rapid socio-cultural assessment conducted in the first year of the EU-WINS programme.

The participants were especially interested to learn more about the cost-effectiveness analyses from both studies, however these results were not yet available.

Day Two - March 1

Welcome Remarks

Shahid Fazal – Deputy Country Director, Action Against Hunger

Shahid Fazal welcomed the participants to the second day of the event. He gave a brief recap of the first day and the agenda of Day Two.

Opening Remarks

Dr. Ghulam Hussain Pir – Lady Health Worker Coordinator, National Programme

Dr. Pir spoke about the role of lady health workers (LHWs) in Pakistan, and how it is crucial to treating children with SAM, at the household level. He discussed how the results from this day will be helpful in proving this, and showing that the proactive approach is supported and provided for by the Pakistan national programme. Overall, LHWs are being involved in the community outreach component of SAM treatment but the following study supports advocating that LHWs can also treat SAM. Dr. Pir expressed interest in learning about the concept further so as to enable integration of SAM treatment into the LHW service delivery package.

Dr. Sohail Chunar

Research Manager, Aga Khan University, C-Project

Dr. Chunar began his presentation by giving an overview of the C-Project: It is an ongoing research project comprised of Action Against Hunger, the [Department of Health in Sindh](#), and Aga Khan University (AKU) in the Dadu District in Sindh, Pakistan. The C-Project aims to address a central resource question: is SAM treatment delivered by LHWs be as effective as SAM treatment delivered at facilities by health centre staff? The study hypothesises that LHW treatment will be as equally as effective. Dr. Chunar outlined the primary and secondary objectives of the study: to evaluate the effectiveness and cost-effectiveness of SAM treatment of children 6-59 months delivered by LHW compared to the standard CMAM programme delivered by the government and Action Against Hunger staff, and evaluate breastfeeding practices across the study, respectively.

Dr. Chunar then continued to discuss the design of the C-Project and recruitment process. He explained the study was a two-armed cRCT with 'Group A' receiving home-based LHW treatment and 'Group B' receiving health facility-based treatment. He concluded by presenting preliminary findings from the study, most significantly, home-based LHW treatment is almost as effective as facility-based treatment, meeting minimum SAM treatment standards. It could be improved through programme-ownership, capacity-building, increased supervision and quality assurance. Dr. Chunar also showed key quantitative findings regarding the number of participants admitted, recovered and relapsed after recovery.

Key Points:

- Recovery and relapse rates in the preliminary results were roughly equal across the study arms, meaning that LHW home-based treatment of SAM was equally as effective; and
- The largest age group within the study were children 6-11 months, or 63.7% of the study.

Dr. Shahid Fazal

Deputy Country Director, Action Against Hunger, [Combined Protocol for Acute Malnutrition Study \(ComPAS\)](#)

Mr. Fazal presented on ComPAS project which is developing and testing a unified nutritional protocol for the treatment of acute malnutrition (MAM and SAM) to optimise growth and minimise cost at each stage of treatment. ComPAS is a research consortium led by the [International Rescue Committee \(IRC\)](#) and Action Against Hunger, and supported by scientists at the [London School of Hygiene and Tropical Medicine](#), [Washington University School of Medicine](#) and [University of Tampere/University of Copenhagen](#). The project is funded by USAID's [Office of Foreign Disaster Assistance \(OFDA\)](#) and [Children's Investment Fund Foundation \(CIFF\)](#).

After introducing the study, Mr. Fazal discussed the initial stages of the project, the formulation of research questions and the study process. The research questions focused on analysing treatment response across various categories, determining energy requirements based on

weight gain and appropriate treatment termination times. Initially, 8,000 children recovering from acute malnutrition in Chad, Kenya, Yemen, and South Sudan countries were retrospectively analysed. From that data, a panel of experts developed a combined protocol that provides the optimal dosage for ready to use therapeutic food (RUTF).

Mr. Fazal then discussed three key findings from the study: (1) middle-upper arm circumference (MUAC) gain and weight gain mirrored each other, and growth velocity slows as children recover; (2) as the growth velocity of children slows, they need fewer kcal/kg/day to achieve the observed growth; and (3) children in Asia responded differently than children in Africa, as results showed that treatment response differed from context to context. This observation indicates that there is a need for a uniform protocol at country level for management of MAM and SAM children. Based on these findings, a proposed protocol was designed, which established that two RUTF sachets is recommended to meet the energy needs of children with MUAC under 115mm and a single RUTF sachet is recommended to meet the energy needs of children with MUAC between 115-125mm.

Mr. Fazal concluded by discussing the second stage of the CompAS project—the piloting of the combined protocol. This stage includes two cRCTs which will test the combined protocol against standard treatments in terms of recovery rates, dropout rate and causes, cost-effectiveness and overall effectiveness. The combined protocol is not only cost-effective but also reduces the average length of treatment and number of RUTF sachets consumption.

Key Points:

- The combined protocol for the CompAS project is designed based on key findings from standard treatments for MAM and SAM, and is intended to minimise cost and optimise growth;
- Children respond differently to treatment in different contexts and there is a need to standardise the treatment for SAM and MAM on the country-level; and
- The piloting of the combined protocol will determine its overall effectiveness compared to standard treatment for SAM and MAM.

Gul Nawaz

Research Manager, Aga Khan University, Effectiveness of food/nutrient based interventions to prevent stunting among children in Thatta & Sujawal districts, Sindh

Mr. Nawaz presented on the food and nutrition-based intervention project in the Thatta and Sujawal districts in Sindh, a project comprised of the [Department of Paediatrics and Child Health](#) at Aga Khan University, Department of Health of the Government of Sindh and the [World Food Programme \(WFP\)](#). It aims to evaluate the effectiveness of food/nutrition based interventions on the reduction of stunting in children under five, address stunting in the first 1,000 days, access interventions for low-birth weight, wasting and anaemia in pregnant and lactating women (PLW) and determine the optimal length of interventions in these areas. The study is a RCT, specifically targeting pregnant women, lactating mothers, children 6-23 months and children 24-59 months. Monthly follow-ups of these target groups were conducted and specific evaluations regarding compliance, dietary diversity, morbidities and birth outcomes were done, followed by quarterly follow-ups specifically for growth outcomes in children under five, and BMI assessments for PLW. The study included indicators for demographic and socioeconomic

status, anthropometric data (stunting, wasting, underweight) and feeding practices and behaviour. Indicators such as anaemia levels, maternal BMI, low birth weight, vaccination status and childhood morbidities were also included in the study.

Mr. Nawaz discussed the key findings of the baseline survey: he showed several visual representations of collected data for social, anthropometric and behavioural data. The findings reveal the prevalence of malnutrition among children under, insufficient feeding practices and a high level of maternal anaemia and low BMI. The results of the study and the endline survey will contain key information for the prevention of stunting.

Mr. Nawaz concluded by discussing the next steps for the study, which includes the endline survey findings with stakeholders and completing and sharing the 1000-days cohort.

Key Points:

- The indicators for the study were based on social, anthropometric, and behavioural data and were meant to evaluate the effectiveness of food/nutrition based interventions on malnutrition and subsequent health effects;
- The results show high rates of abnormal haemoglobin levels and less than optimal BMI in measurements of maternal nutrition status; and
- The results show there is room for improvement in child feeding practices.

Overview of Discussion

After the presentations were made, the floor was opened to questions and comments. Some of the questions received around the study details had to do with: challenges in implementing the C-Project, government utilisation of results, drop rates in CompAS and selection criteria.

Overall, participants were also interested in discussing the results of the Thatta Project and cost-effectiveness of the programme.

Participants also asked about the second phase of CompAS in Pakistan.

Guest Remarks

Dr. Naveed Bhutto, Policy Officer, [Planning and Development Department, Sindh](#)

The [Nutrition Support Program \(NSP\)](#) has developed BCC material, and tremendous efforts have been made to construct a unified BCC tool kit. As a programme policy officer at the Sindh Fortification Alliance, Dr. Bhutto spoke of the process of producing advocacy and legislative procedures to promote food fortification. The Deputy Director General Health, Dr Fahim, commented that the BCC strategy is almost ready, and endorsement is anticipated. It would be a unified strategy specific to the context of Sindh with a focus on a nutrition-sensitive integrated approach.

Closing Remarks

Dr. Fahim Aijaz, Deputy Director General, Sindh

Dr. Aijaz extended her thanks for being inviting to speak at this important event. She mentioned that the situation of malnutrition is not improving fast enough in Pakistan, and the situation in Sindh is especially dire. Studies such as the ones which were presented over the course of these two days would help in bridging the evidence gaps and supporting the Government of Pakistan for future programmes and interventions. This event has also demonstrated how Pakistan has been able to build collaborative partnerships and linkages among non-governmental organizations, academia and government departments and agencies.

Lastly, Dr. Aijaz thanked everyone for their attendance and participation.

Conclusion

Malnutrition is linked to almost half of all childhood deaths under five. This accounts for about three million children deaths a year. Focusing interventions on the prevention of undernutrition, and the first 1,000 days from a woman's pregnancy to a child's second birthday can greatly reduce this number of malnourished children worldwide. While many gaps still exist in the evidence base of how to best achieve nutritional outcomes in interventions, there are many studies which can provide insight into some aspects of child nutrition.

This two-day research event brought to light results from studies focusing on nutritional objectives conducted in Pakistan. Recently, the Government of Pakistan has taken positive steps towards improving nutrition in the country, and provinces have made their Planning Commissions and started implementing them. Particularly in Sindh, the Planning Commission is designed for nine districts, and currently operating in five of them. The Government of Sindh has taken initiative towards implementing a nutrition-sensitive approach for all its 29 districts, and has asked for workplans from all the departments. These steps taken by the Government show a positive step towards endorsement, and ownership over programmes on multiple levels of the government. While undernutrition remains a pressing challenge in Pakistan, the workshop offered insight into the ongoing efforts to improve the situation while also building the evidence base for further implementation of best practices.

Annex 1 – Presentations

RESEARCH ON FOOD ASSISTANCE FOR NUTRITIONAL IMPACT

Bridget Fenn
REFANI-Pakistan, PI

Nutrition Research Event
28th February 2017, Islamabad



REFANI

**THIS PRESENTATION CONTAINS RESULTS WHICH ARE UNDER PEER REVIEW - IT IS
NOT INTENDED FOR SHARING OR DISTRIBUTION**

Outline

1. Introduction to REFANI Consortium
2. REFANI Pakistan study (methods)
3. Results
 - Impact results –Month 6 and Month 12
4. Papers

Introduction

Consortium partners:

- Action Against Hunger
- Concern Worldwide (CWW)
- Emergency Nutrition Network (ENN)
- University College London (UCL)

Funding:

- UK aid from the UK Government
- Humanitarian aid from the European Commission

Duration: March 2014 – August 2017



Overall Project Aim

To ensure more effective humanitarian interventions by strengthening the evidence base on the impact of cash and voucher-based food assistance to prevent undernutrition in emergencies

Objectives:

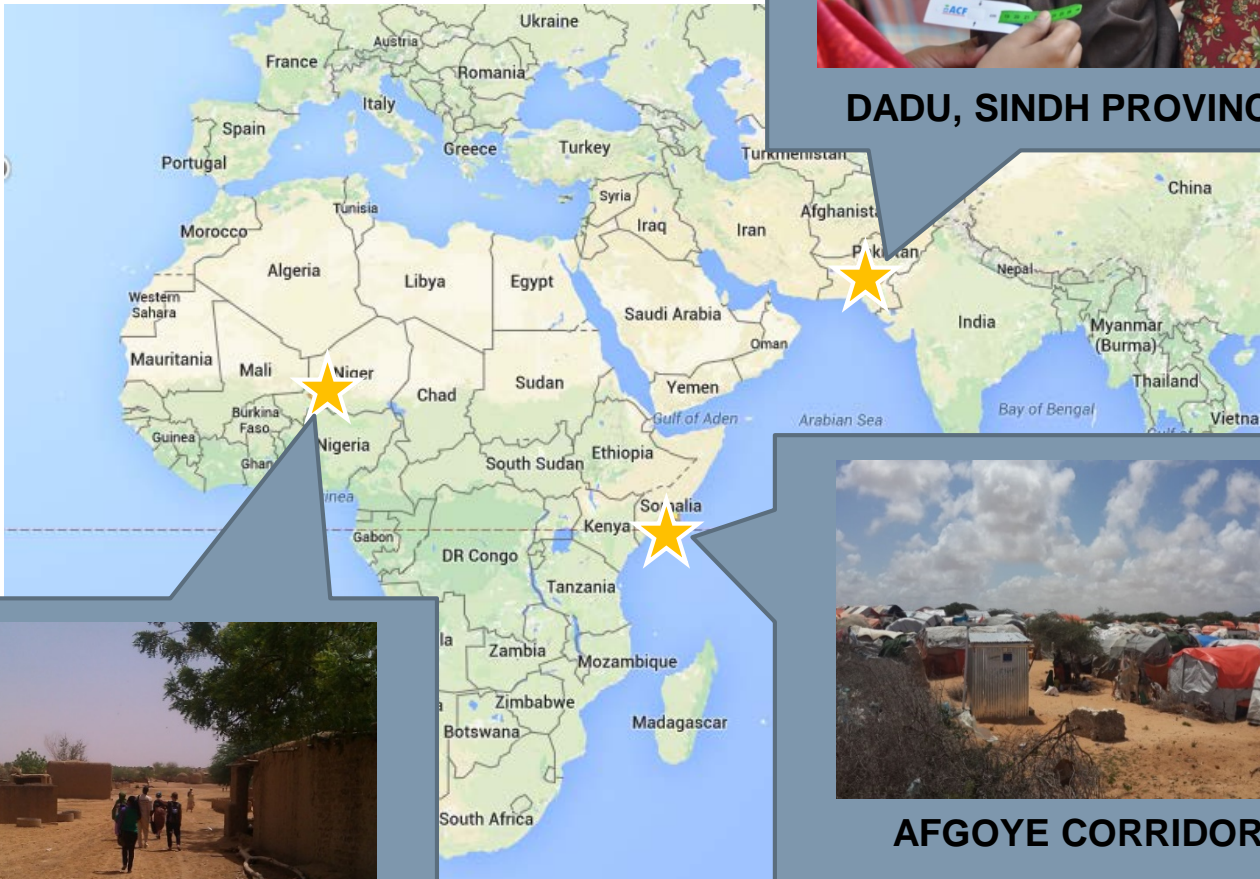
1. To create high-quality, relevant research that fills gaps in the evidence base
2. To make results accessible to both technical and non-technical audiences
3. Ensure successful uptake of REFANI research by key stakeholders in policy and practice

REFANI Country Studies

Pakistan

Niger

Somalia



DADU, SINDH PROVINCE



AFGOYE CORRIDOR

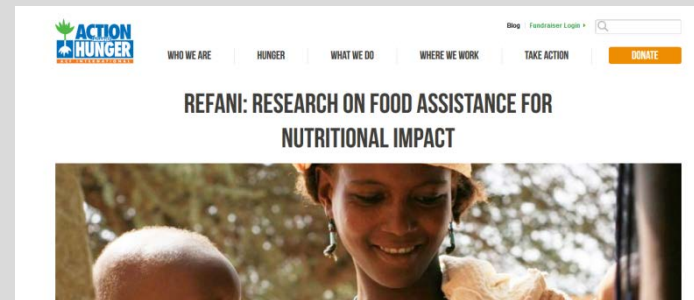


TAHOUA DISTRICT

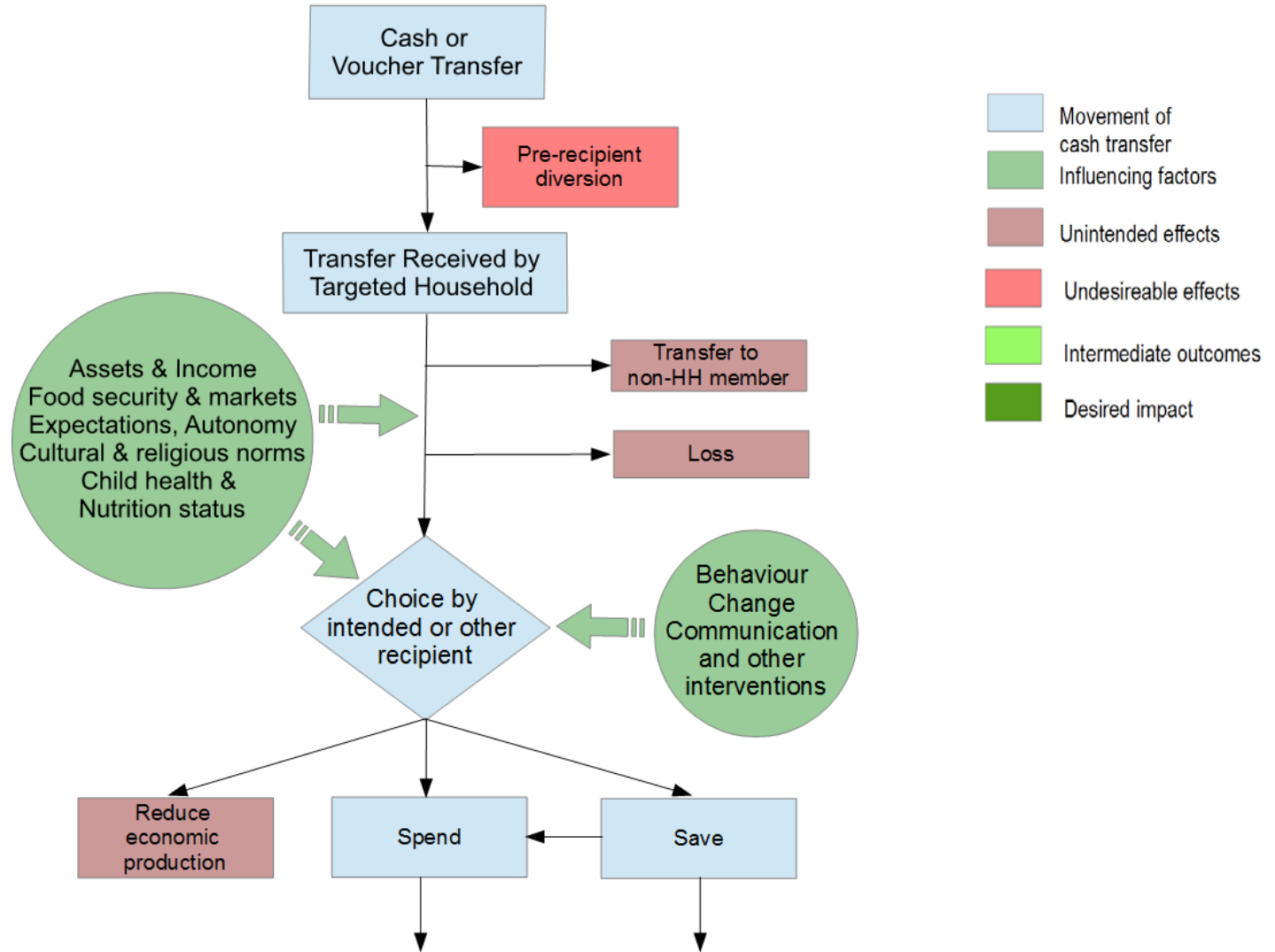
REFANI Literature Review

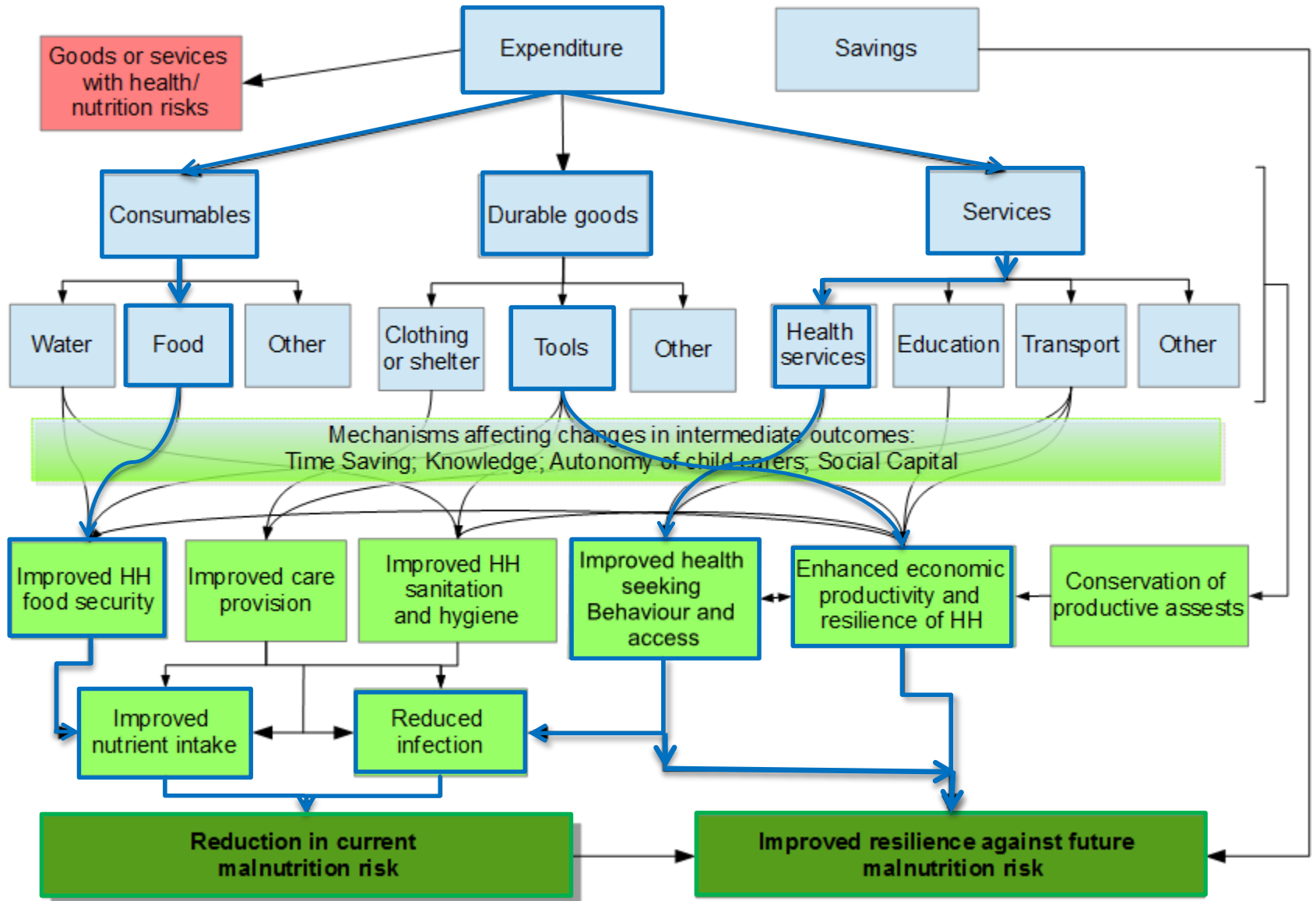
- Complementarity
- Design
 - Cash vs Vouchers
 - Amount
 - Timing and duration
 - Conditionality
 - Targeting
 - Communication
 - Sustainability
- Behaviours, processes, empowerment, care practices and nutrition impact pathways
- Cost-effectiveness

Available on the REFANI website:
<http://www.REFANI.org>



REFANI Theory of Change





REFANI-PAKISTAN STUDY (REFANI-P)

A cluster RCT to measure the effectiveness and cost-effectiveness of cash-based transfer programmes on nutrition status, Sindh Province, Pakistan

ISRCTN #10761532

Principal Investigator:
Bridget Fenn PI (ENN)



REFANI

REFANI-P Study Site



REFANI-P Hypotheses

(Linked to the [REFANI Literature Review](#))

1. Cash vs Vouchers

- Vouchers would be more effective than cash of the same value

2. Amount

- A higher amount of cash would be more effective for short term impact than a lower amount of cash

3. Sustainability

- A higher amount of cash would be more effective for longer term impact than a lower amount of cash

REFANI-P Study Objectives

1. Compare the nutrition status of children receiving a seasonal unconditional cash transfer or a food voucher with those receiving ‘standard’ care (EU-WINS) only after 6 months and at 1 year
2. Assess the costs and cost-effectiveness of the different interventions
3. Understand the factors that determine the ways in which households use the different transfers
4. Explore the role of the different processes involved in the study outcomes and how they interact with the context

114 villages - (2496 HHs; >3500 children)

STUDY ARM	DESCRIPTION
1. Control Group (CG)	WINS
2. Unconditional ‘Standard’ Cash Transfer (SC)	RS 1,500 /month (£10) + WINS 
3. Unconditional ‘Double’ CT (DC)	RS 3,000 /month (£20) + WINS 
4. Fresh Food Voucher (FFV)	RS 1,500 /month (£10) + WINS 

Sample Size and Selection Criteria

- Poor and very poor households with a child 6–48 months at baseline
- Aim to reach at least 632 HHs in each intervention arm (fixed sample size)
 - achieved (except for DC = 600HHs)
- At least **26** clusters (villages) per arm.

CG=28; DC=24; FFV=31; SC=31

Timeline

2015		2016	
Pre-intervention period		Intervention period	Post-intervention period
Jan/May	June/August	July-December	Jan +
Formative research, training, piloting, sensitisation, randomisation	BASELINE	MONTHLY	ENDLINE
		Qualitative data collection	Analyses
		Costing data collection	Reporting

REFANI-P Primary Outcomes

Children < 5 years

- Weight-for-height z-score (WHZ) < -2
- Mean WHZ score



Secondary Outcomes

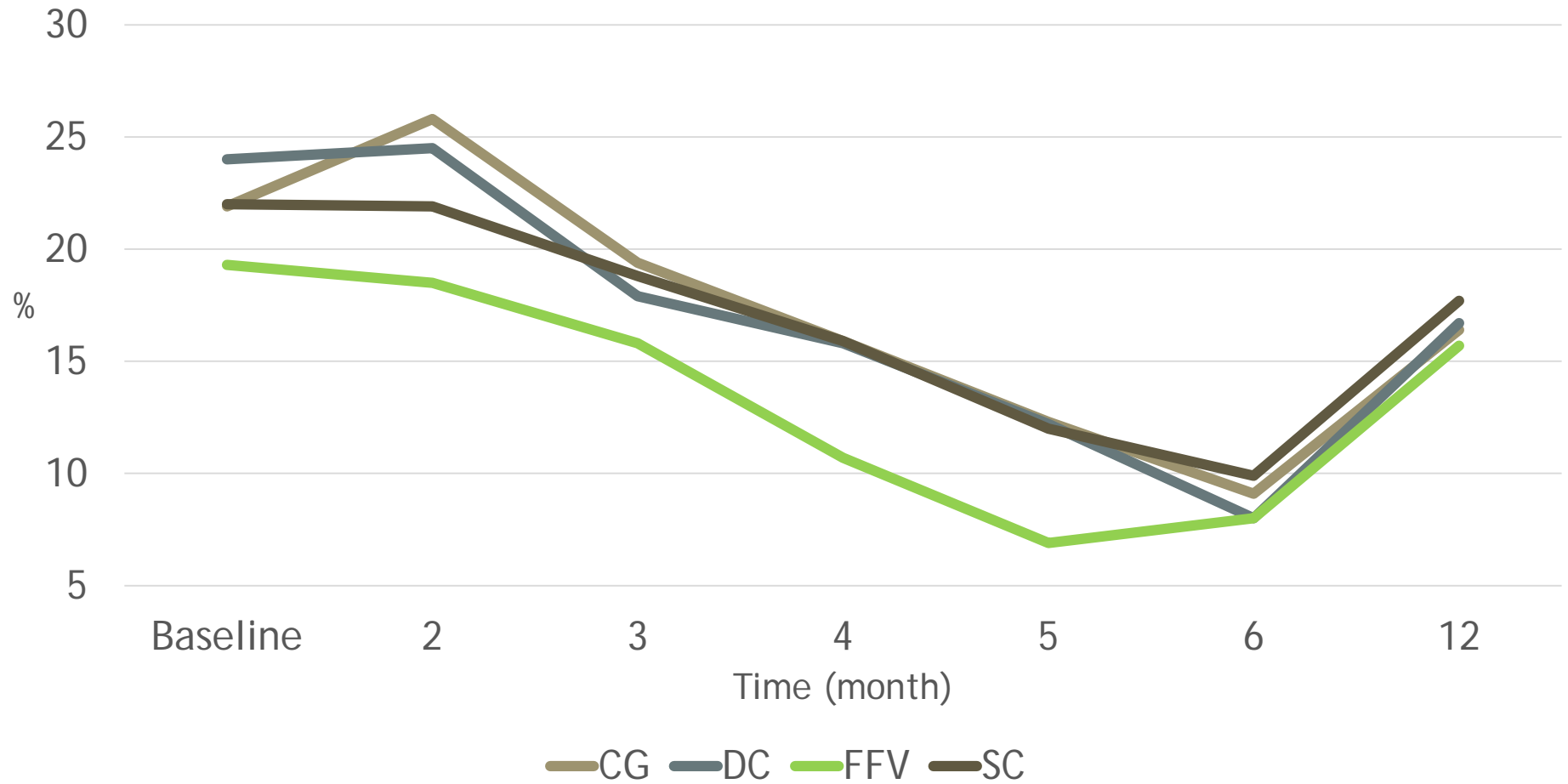
Children

- % Severe wasting
 - Mean MUAC, mm
 - % Stunting (moderate & severe)
 - % Morbidity (co-morbidity)
 - Mean haemoglobin Hb, g/dl
- Mean BMI, kg/m^2
 - Mean MUAC, mm
 - Mean Hb, g/dl

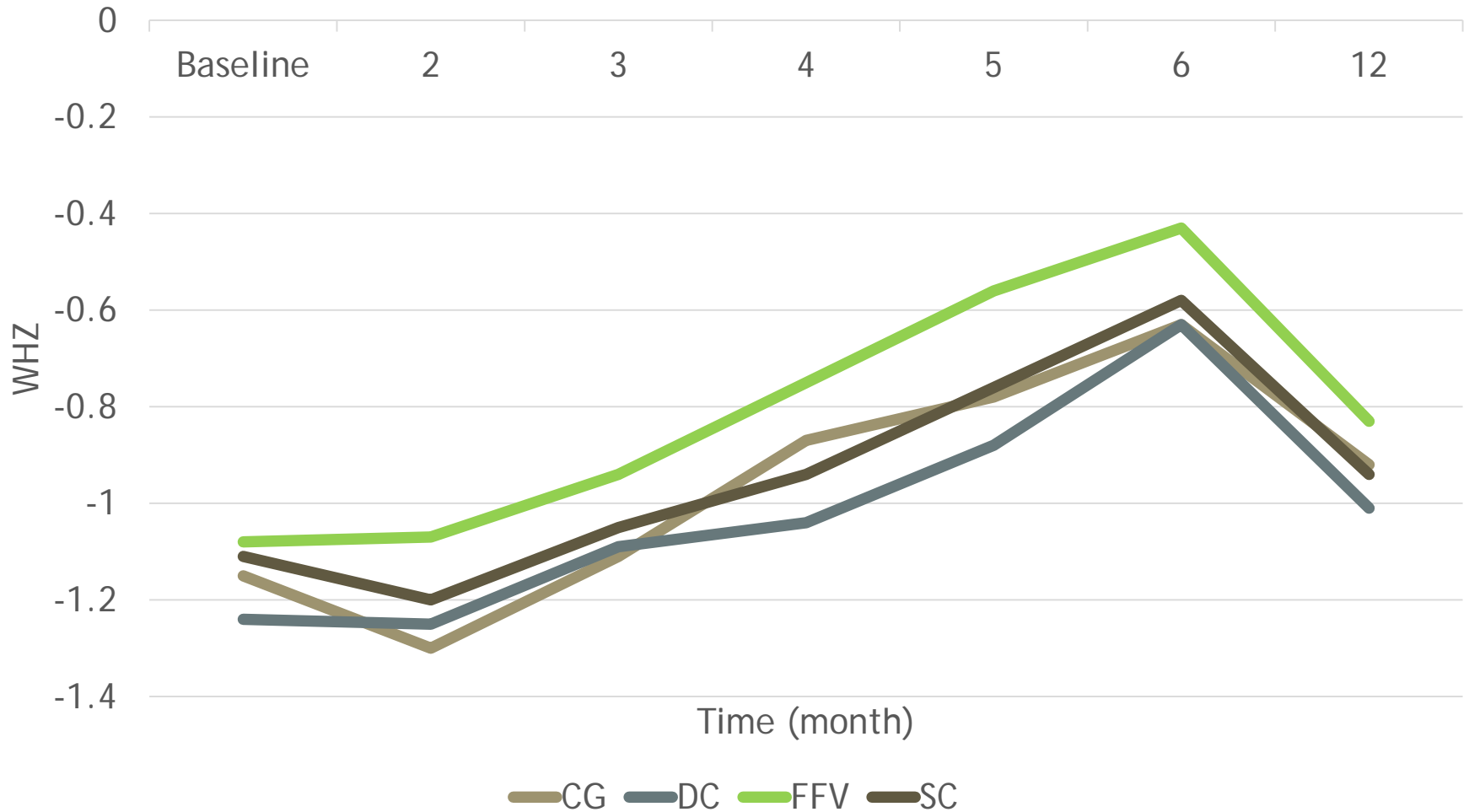


• Women

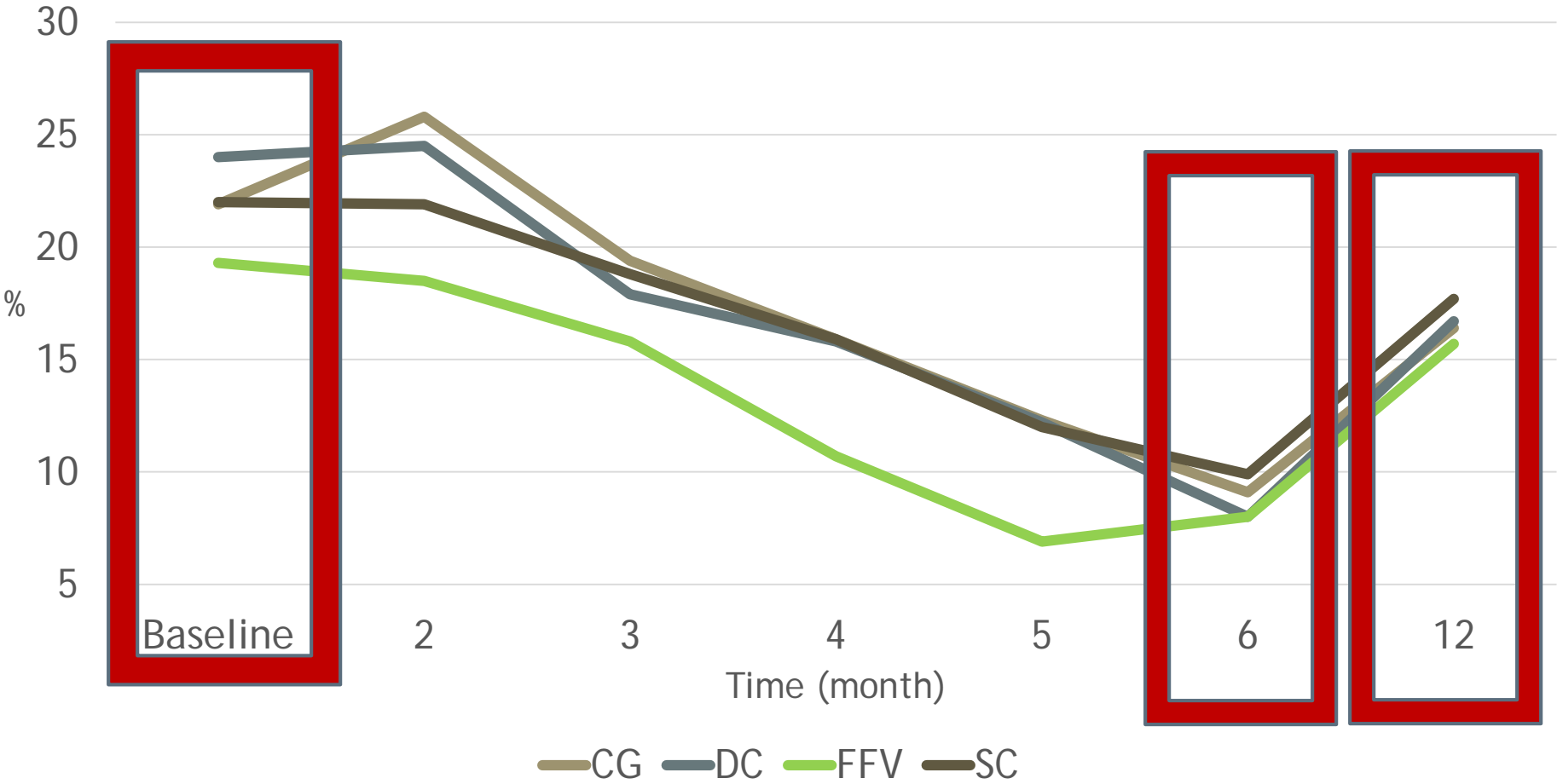
Prevalence of WHZ <-2 - over time



Mean WHZ - over time



Prevalence of WHZ <-2 - over time



Results Summary – At Month 6

	DC	FFV	SC
Primary outcomes	Decrease in risk of a child being wasted (WHZ<-2)		
	Increase in mean WHZ scores	Increase in mean WHZ scores	
Secondary outcomes		Increase in mothers BMI	
		Decrease in mean Hb concentration in mothers <u>and</u> children	Decrease in mean Hb concentration in mothers
	Decrease in risk of child HAZ<-2 & HAZ<-3	Decrease in risk of child HAZ<-2 & HAZ<-3	Decrease in risk of child HAZ<-2 & HAZ<-3
	Increase in mean HAZ scores	Increase in mean HAZ scores	Increase in mean HAZ scores
Other	Increase in HH and individual dietary diversity +++	Increase in HH and individual dietary diversity +	Increase in HH and individual dietary diversity ++

Results Summary – At Month 12

	DC	FFV	SC
Primary outcomes	--	--	--
Secondary outcomes	Decrease in risk of child HAZ<-2 & HAZ<-3 Increase in mean HAZ scores	Decrease in risk of child HAZ<-2 & HAZ<-3 Increase in mean HAZ scores	Decrease in risk of child HAZ<-2 & HAZ<-3 Increase in mean HAZ scores

REFANI-P Hypotheses

1. Cash vs Vouchers

- Vouchers would be more effective than cash of the same value: **Increase in mean WHZ but not mean Hb**

2. Amount

- A higher amount of cash would be more effective for short term impact than a lower amount of cash: **Yes for weight-based indicators**

3. Sustainability

- A higher amount of cash would be more effective for longer term impact than a lower amount of cash: **Not for weight-based indicators BUT similar for height-based indicators**

Operational challenges

- **Time (baseline took longer than planned)**
 - Recruitment of (female) staff
 - Mapping by hand! No GPS allowed
 - Ramadan
 - Monsoon
- **Climate**
 - 52 degrees (staffing)
 - Haemocues

REFANI-P Papers

1.

Fenn et al. *BMC Public Health* (2015) 15:1044
DOI 10.1186/s12889-015-2380-3



STUDY PROTOCOL

Open Access



The REFANI Pakistan study—a cluster randomised controlled trial of the effectiveness and cost-effectiveness of cash-based transfer programmes on child nutrition status: study protocol

Bridget Fenn^{1*}, Ghulam Murtaza Sangrasi², Chloe Puett³, Lani Trenouth³ and Silke Pietzsch³

For more information, please refer to
www.refani.org, or email
REFANI@actionagainsthunger.org

2. Impact paper submitted for peer-reviewed for peer-review –
PLOS ed

3. Process evaluation paper being drafted –

- **Context**
- **Intervention implementation**
- **Mechanisms of impact (mediation analysis)**

REFANI Contributions (End-of Project)



PAKISTAN



NIGER



SOMALIA

SYNTHESIS

- To present findings in a way that identifies common themes and patterns across studies
- Relevant implications for policy, practice and research

SUMMARY

- To summarize key findings from REFANI's research
- For those who want to quickly review the research and its implications

Thanks to...



REFANI-P study participants and field teams
The Emergency Nutrition Network (ENN),
Action Against Hunger USA/Islamabad/Dadu
the REFANI consortium and all the members of the
REFANI steering committee



REFANI
Research on Food Assistance
for Nutritional Impact



REFANI

For more information, please refer to www.refani.org, or
email REFANI@actionagainsthunger.org



Effectiveness of Safe Drinking Water in Community-Based Treatment of Severe Acute Malnutrition



Islamabad, Feb 2017



Introduction: Research for Health in Humanitarian Crises (R2HC)

- R2HC - focuses on adding to the body of knowledge about best practices regarding public health in humanitarian crises

- R2HC supports collaborative projects between NGOs and research institutions:
 - Action Against Hunger in Dadu, Sindh, Pakistan and Johns Hopkins School of Public Health (JHSPH) in Baltimore, Maryland, United States

- R2HC is funded UKAID/DFID and the Wellcome Trust, managed by Enhancing Learning and Research in Humanitarian Assistance (ELRHA)



Research Questions

- Research question:
 - Does addition of safe drinking water improve the effectiveness, cost effectiveness, and recovery rate of SAM treatment?
 - Hypothesis that safe drinking water reduces treatment/recovery time and improves the cost effectiveness of SAM treatment
 - Evaluate and compare the effectiveness and acceptability of three Point of Use (PoU) water treatment technologies in the context of a Community-Managed Acute Malnutrition (CMAM) program

- Study outcomes contribute to the understanding of the management of children with SAM, and provide the basis for recommendations to improve SAM treatment protocols and policy



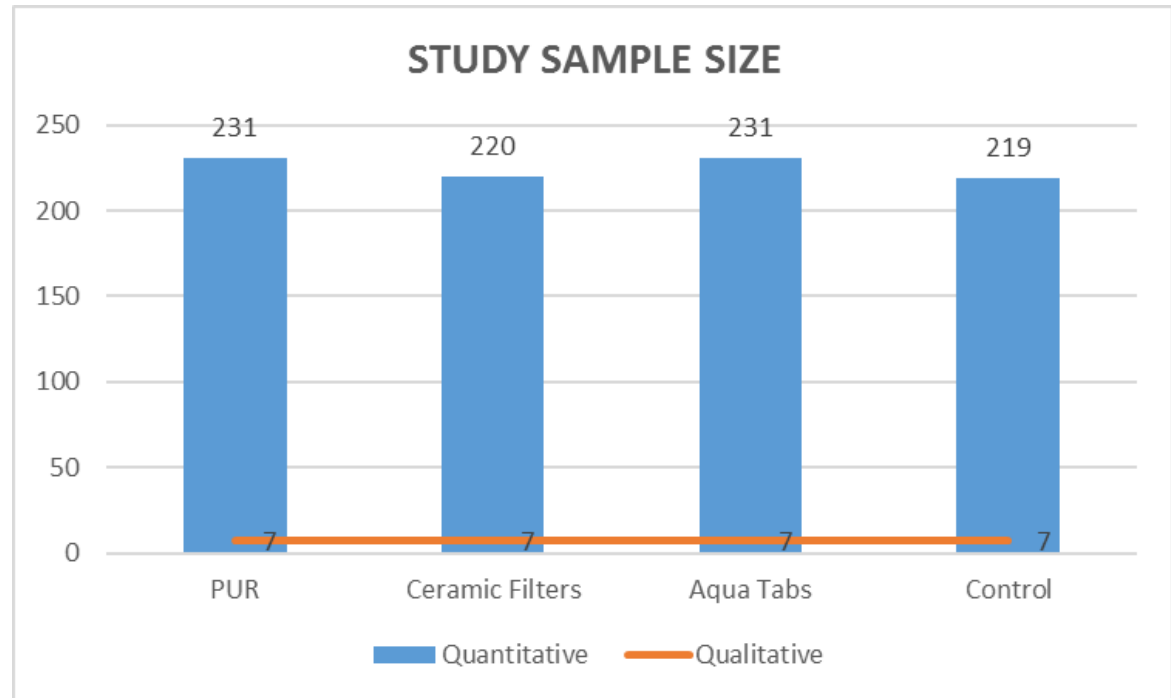
R2HC: Study Methodology

- Mixed methods: quantitative and qualitative
- Quantitative: randomized control trial (RCT)
 - Four study arms:
 1. Standard SAM treatment (control)
 2. Standard SAM treatment + flocculant-disinfectant water treatment (Proctor & Gamble Purifier of Water) - PUR
 3. Standard SAM treatment + chlorine disinfectant (Aquatabs)
 4. Standard SAM treatment + ceramic water filter
- Qualitative: in-depth interviews and household-level observations



R2HC: Study Preparation

Preparatory Work (October 2015-January 2017)



- Minimum sample size for each study arm: 210 participants
- Study enrolled a total of 901 participants: 231 participants in the PUR and Aquatabs arms, 220 participants in the filters arm, and 219 participants in the control arm.
- Of these participants, seven participants in each arm participated in the qualitative data collection.

Study Arms

PUR Sachets
(Flocculant+
Disinfectant Water
Treatment)

Ceramic Filters
(Water Filters)

Aquatabs
(Chlorine
Disinfectant)

Control
(Standard Practices)

A
R
M

Dadu MNCH, Jhalo,
Kheram Mangwani
and Essa Khan Thebo

Dadu DHQ, Nau
Goth, Rawat Leghari,
Piyaro Station, Kamal
Khan

K. N. Shah, Phulji
Station, Bhuglo, Pipri,
Phull Village

Mehar, Pat Sharif,
Thariri Muhabat,
Bahawalpur, Phakka

S
I
T
E
S

OTP + Hygiene
Promotion

OTP + Hygiene
Promotion

OTP + Hygiene
Promotion

OTP + Hygiene
Promotion

S
E
R
V
I
C
E
S



PUR sachets to purify
20L water/day, water
cooler, bucket, stir
rod, filtration cloth



Ceramic filter with six
candles, water cooler,
filtration cloth,
sponge



Aquatabs to purify
20L water/day, water
cooler, filtration cloth



Water cooler

Study Timeframe

Preparatory Work (October 2015 - January 2016)

Data Collection (22nd February 2016 – 15th November 2016)

Quantitative

Enrollment (22nd Feb-31st May 2016)

Follow-up at OTP Site (weekly)

Follow-up at HH (4-6 weeks after enrollment)

Exit (when child's MUAC reaches 125mm)

Qualitative

Enrollment (8th March – 31st May 2016)

In-depth Interview I (1 week after enrollment)

In-depth Interview II (4-6 weeks after enrollment)

Observation (with IDI II)

Data Cleaning (November 2016 – December 2016)

Data Analysis (January 2017 – February 2017)

Preliminary Results (March 2017)

Beneficiaries Count

Study Arm	Target	Enrolment	Target Interviews (Qualitative)	Discharged Cured (MUAC \geq 125mm)	Exit due to other Criteria (Def, NR, Dth, or Moved Out)
PUR Sachets	210	231	7	180	51
Ceramic Filters	210	220	7	164	56
Aquatabs	210	231	7	186	45
Control	210	219	7	150	69
Total	840	901	28	680	221



Beneficiaries Exit Summary

Category	Number of Children
Discharged as Cured	680
Moved away	1
Transferred to other OTP site	2
Died	9
Defaulted	82
Migrated	4
Non-Responder (NR)	87
Transferred to Nutrition Stabilization Center	36
Grand Total	901



Research Operational Challenges

Challenge

Mitigation Strategy

Non-availability of Pathoscreen pillows in local market

A local alternative was identified and verified: a qualitative test prepared by the Pakistan Council for Research on Water Resources

High temperatures during the summer season in study area, participants of ceramic filters arm were reluctant to use water from the plastic buckets

Participants were advised to keep filtered water in clean clay pitchers to balance the temperature; adherence continued to be tracked through HH monitoring visits



Final Steps

- Both qualitative and quantitative data are currently under analysis to produce effectiveness results
- Costing analysis from participants and accounts completed, and waiting for effectiveness results to be ready to link for Cost Effectiveness Analysis
- Project to close April 2017, all reporting and publishing completed



Result Implications

- Findings have the potential to provide evidence:
 - Regarding the linkages of safe water treatment and recovery from undernutrition.
 - About comparative effectiveness and cost-effectiveness of the inclusion of each of the three PoU water treatment devices.
 - To inform innovative design and implementation of CMAM programs.
 - To offer insight into the challenges of including PoU water treatment devices in a CMAM program.
 - Around reduced recovery time and length of stay in CMAM program, providing an opportunity to treat more children with SAM.



Thank you!
Any
questions?



Ministry of Health
Government of Pakistan



**Evaluation of the effectiveness and
Impact of community case management of
Severe Acute Malnutrition (SAM) Through
lady health workers (LHWs) as compared to a facility
based Program: A Cluster Randomized Controlled Trial.
District Dadu Province Sindh.**

**Dr. Sajid Bashir Soofi (PI), Dr. Shabina Ariff (Co-PI), Dr. M. Ali Turab (Co-PI),
Imtiaz Hussain (Project Manager), Dr. Suhail Channar (Site Manager)
Imran Ahmad (Data Manager), Zaid Bhati (Data Analyst)**

Study Partners

- Department of Health, Government of Sindh.
- Action Against Hunger.
- Aga Khan University.

Project Activities and Time Lines

- Agreements, approvals and stakeholders meeting: **August-September 2014.**
- Baseline data collection: **September - December 2014.**
- Recruitment and training of project staff for cRCT: **January–February 2015.**
- Recruitment/enrollment of SAM cases in cRCT: **April 2015-April 2016.**
- Follow Ups: **April 2015-July 2016.**
- Sharing of study findings with provincial health authorities and stakeholders:
March 2017.

Research Question and Hypothesis

Research Question:

- Will SAM treatment delivered through LHW at household level be as effective as SAM treatment delivered at facility level by health center staff?

Hypothesis:

- Provision of SAM treatment at household level in a community through lady health workers will be as effective (recovery rate, survival, cost effectiveness, coverage) as treatment provided at facility level.

Objectives Of Study

Primary Objectives

- To evaluate the effectiveness (rate of recovery, relapse & coverage), of SAM treatment of children 6-59 months delivered at household level by first level health care providers (Lady Health Workers) compared with the standard CMAM program delivered at health facility by Govt and ACF staff.
- To evaluate the cost effectiveness of treatment of SAM provided by LHWs at community level versus treatment delivered at health facility by Govt and ACF staff.

Secondary Objectives

- To evaluate the breast feeding and complementary feeding practices in both study arms.

Components of Impact Assessment

- **By AKU**
 - Recovery
 - Survival
 - Relapse

- **By ACF**
 - Costing study
 - Coverage survey
 - Quality of Care Assessment

Target Areas and sample size estimates

- Study was implemented in LHWs catchment area of following six health care facilities of District Dadu.

INTERVENTION Group A- Home based	CONTROL Group B- Health facility based
BHU Baid	BHU Borirri
BHU Khanpur	BHU Kolachi
BHU Gozo	RHC Sita Road

Sample Size *

- Total 6 study clusters (3 clusters per arm) were required, with 127 participants per cluster. The total sample size calculated was 762 participants; **381** participants per study arm.

*The sample size was calculated taking a 6% prevalence of SAM (estimated National Nutritional Survey 2011) with an anticipated difference of 20% between the group means, using a power of at least 95%, standard deviation of 0.5, an intra-correlation of 0.0010 and an alpha level of 0.05 (two sided).

Inclusion & Exclusion Criteria

Main Target Population

- Main target population was children under 6- 59 months of age fulfilling the case definition of severe malnutrition.

Inclusion Criteria

- Born and eligible for inclusion within the study period.
- Presence of severe acute malnutrition (SAM).
- Ability of the parents or guardians to provide informed consent.

Exclusion Criteria

- Presence of chronic debilitating illness.
- Residence outside of study areas.
- Inability or refusal of the parents or guardians to give informed consent, or refusal of assessment.
- IDP population

Study Design

Cluster Randomized Controlled Trial

- A 2-armed cluster randomized controlled trial was designed.
- Each cluster was allocated to intervention group A and group B.

INTERVENTION Group A- Home based	CONTROL Group B- Health facility based
Comprehensive training of LHWs	Comprehensive training of LHWs in screening and health facility staff in SAM treatment delivery
Identification and management of un-complicated severe acute malnutrition cases at household level and referral to health facility/hospital of cases with complications	Identification of cases in community by LHWs and volunteers and referral to nearest health facility for management of SAM cases as per standard CMAM guidelines
Nutrition & IYCF Counselling at household level	Nutrition & IYCF Counseling at household level

Role and Responsibilities of Partners

Health Department and LHW programme	ACF	Aga Khan University
Approval for implementation of project.	Liaison with stakeholders for the implementation and approval from relevant departments	Development of study instruments (data collection tools, manuals progress sheets etc.)
Identification of potential areas for intervention delivery	Finalization of study areas with AKU for intervention based on agreed indicators	Finalization of study areas with ACF for intervention based on agreed indicators
Implementation of intervention as per CMAM ACF guidelines in both arms	Training of LHWs on intervention delivery and reporting	ERC approval from AKU Baseline survey
Reporting of SAM case to ACF	Provision of SAM case list to AKU for enrollment in RCT	Enrollment of SAM case in cRCT after re-assessment
	Provision of supplementation	Follow-up of enrolled cases
	Coverage assessment Cost effectiveness	Final report

SAM Cases recruitment mechanism

INTERVENTION Group A- Home based

CONTROL Group B- Health facility based

Identification and admission of SAM cases by LHWs

Identification and Referral of SAM cases by ACF/LHW

Report to ACF by LHWs

Notification by ACF to AKU team

Visit of all cases by AKU team & recruitment of eligible cases

Weekly Visit status Report by AKU to ACF

Fortnightly Follow ups

Overall Recruitment Status

HCF	SAM Cases reported by ACF	Visited SAM Cases by AKU	Enrolled in RCT	Not SAM	Guest/ Shifted	Not Found	Absent /Refused	Age (<6 or >59 Months)	Complication/ Chronic Illness
BHU Baid	269	269	145 (54%)	104	4	1	2	2	11
BHU Khan Pur	201	201	125 (62%)	42	11	10	6	3	4
BHU Gozo	300	300	160 (53%)	101	2	17	5	3	12
Home Based	770	770	430 (56%)	247	17	28	13	8	27
BHU Borirri	132	132	107 (81%)	7	5	7	0	0	6
RHC Sita	214	214	155 (72%)	5	6	30	3	1	14
BHU Kolachi	177	177	137 (77%)	11	5	7	6	1	10
Facility Based	523	523	399 (76%)	23	16	44	9	2	30
Grand Total	1293	1293	829 (64%)	270	33	72	22	10	57

- 229 SAM cases reported from out of study areas and 123 cases reported twice. (Excluded from reported SAM cases)
- Data compiled from 11th April 2015 to 12th April 2016.

Baseline Characteristics of Children Enrolled in cRCT

	INTERVENTION Group A- Home based (n=430)		CONTROL Group B- Health facility based (n= 399)	
Age	n	%	n	%
06-11 months old	262	60.9	254	63.7
12-23 months old	143	33.3	119	29.8
24+ months old	25	5.8	26	6.5
Anthropometry				
Weight (kg) (Mean \pm SD)	430	5.4 \pm 1.19	399	5.7 \pm 1.13
MUAC(mm) (Mean \pm SD)	430	109.6 \pm 5.69	399	109.2 \pm 6.59

Consort

Total Admissions
829

Intervention
430

Control
399

Transferred(in-patient care) =4
Moved out from study area=1

Transferred(in-patient care) =1
Moved out from study area=5

Exits=425
Recovered=323 (76%)
Defaulted=16 (3.8%)
Died=1 (0.2%)
Non-recovered=85 (20%)
% Relapse (after recovery)= 47
(14.6%)

Exits=393
Recovered=326 (83%)
Defaulted=10 (2.5%)
Died=2 (0.5%)
Non-recovered=55 (14%)
% Relapse (after recovery)=46
(14.1%)

Key Findings

	INTERVENTION Group A- Home Based		CONTROL Group B- Health Facility Based		p-value
	n	%	n	%	
Admitted (N)	430		399		
Exits	425	98.8	393	98.5	0.102
Transfer(in-patient care)	4	0.9	1	0.3	
Shifted/moved out from study area	1	0.2	5	1.3	
Exits (N)	425		393		
Recovered	323	76.0	326	83.0	0.014
Defaulter	16	3.8	10	2.5	0.32
Death	1	0.2	2	0.5	0.518
Non-recovered	85	20.0	55	14.0	0.023
Relapse (after recovery)					
Number of recovered cases	323		326		
% Relapse (after recovery)	47	14.6	46	14.1	0.873
Relapse (Mean ± SD days) after recovery	47	26±12.68	46	25.5± 10.96	

Preliminary Findings

- We found that the home based approach through LHWs for treatment of uncomplicated SAM cases is almost effective as facility based treatment.
- Home based treatment conducted by LHWs meets minimum sphere standards for the SAM treatment (>75%).
- It can be strengthened through program ownership, intensive capacity building, close supervision and timely quality assurance.

THANKS



Combined Protocol for Acute Malnutrition Study (ComPAS)

LONDON
SCHOOL OF
HYGIENE
& TROPICAL
MEDICINE



CIFF CHILDREN'S
INVESTMENT FUND
FOUNDATION



Islamabad, Mar 2017



Brief: Combined Protocol for Acute Malnutrition Study (COMPAS)

Combined Protocol for Acute Malnutrition Study, known as ComPAS, is a research consortium led by the International Rescue Committee and Action Against Hunger and funded by USAID's Office of Foreign Disaster Assistance (OFDA) and Children's Investment Fund Foundation (CIFF). ComPAS is supported by an expert task force of scientists at the London School of Hygiene and Tropical Medicine, Washington University School of Medicine, and University of Tampere/University of Copenhagen.

Expected Duration: October 1, 2014 - December 31, 2017



Introduction: Combined Protocol for Acute Malnutrition Study (COMPAS)

Primary Objective:

To develop and test a combined protocol for the treatment of severe and moderate acute malnutrition that improves the coverage, quality, cost-effectiveness and continuity of care.

GOAL

ComPAS is to simplify and unify the treatment of uncomplicated severe and moderate acute malnutrition for children 6-59 months into one protocol. The combined protocol will use mid-upper arm circumference as the sole indicator of energy needs and provide treatment using one product (Ready to - Use Therapeutic Foods) at doses tested to optimize growth and minimize cost at each stage of treatment. These efforts aim to improve the coverage, quality, continuity of care and cost-effectiveness of acute malnutrition treatment in resource constrained settings



Stage - 1- Research Questions

- Retrospective Data Analysis: The first stage is focused on analysis of patient records from IRC and Action Against Hunger outpatient therapeutic feeding programs (OTP) and supplementary feeding programs (SFP) in order to analyze response to treatment and make recommendations for the development of the Combined Protocol. Key research questions will include:
 - Does treatment response (and energy / RUTF requirements) differ by context, age, clinical or other considerations?
 - What are energy requirements based on average weight gain? What is the required RUTF dose?
 - When is the appropriate time and cut-off for discharge criterion based on response to treatment in different geographic contexts?



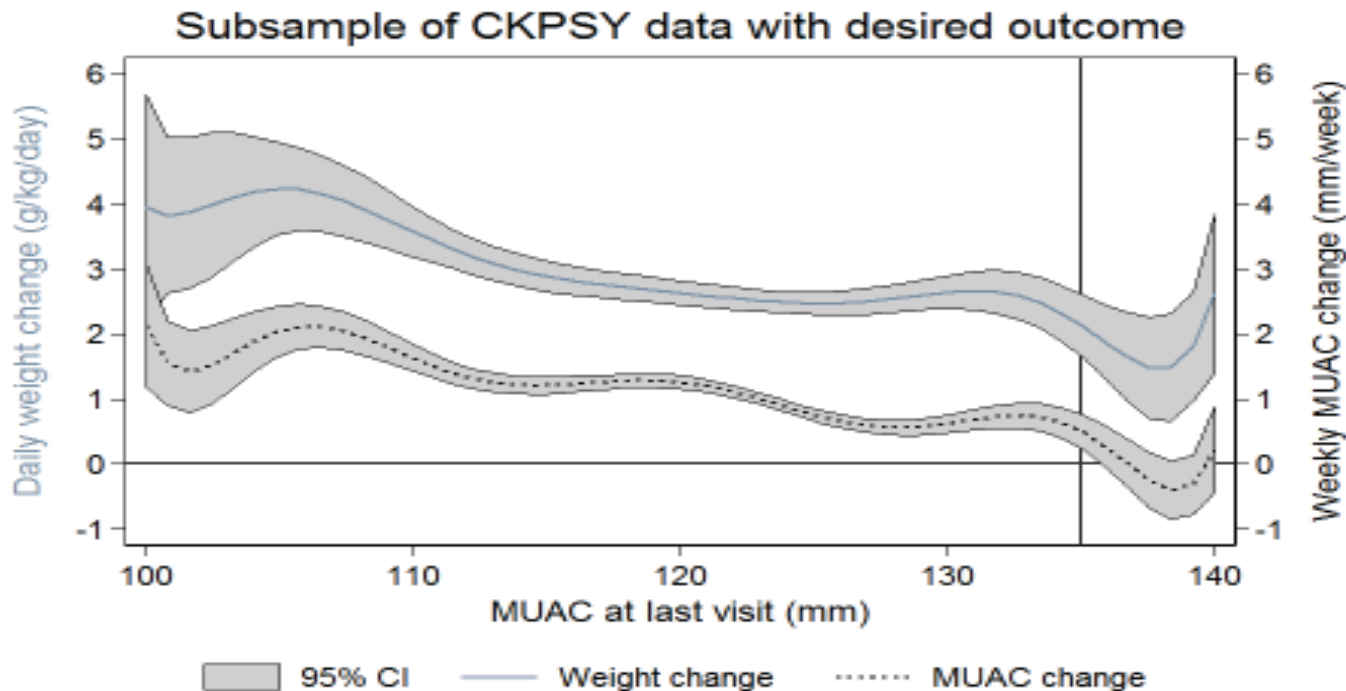
Stage - 1- Process

- In Stage One, ComPAS analyzed the growth trends and energy requirements of 8,000 children recovering from acute malnutrition in Outpatient Therapeutic Programs and Supplementary Feeding Programs in five countries. The observational data came from patient cards provided by IRC, Action Against Hunger and MSF-France. Response to treatment was assessed in different sub-groups of children, including by region, age, stunting and wasting status, and treatment outcome. The final analysis was reviewed by a panel of experts who proposed a simplified protocol that provides an optimal dosage of RUTF correlated with MUAC category.

Key Finding - 1

- MUAC gain and weight gain mirror each other

GRAPH 1: Comparing trends in MUAC and proportional weight change over MUAC at last visit in all patient-visits with desired outcome

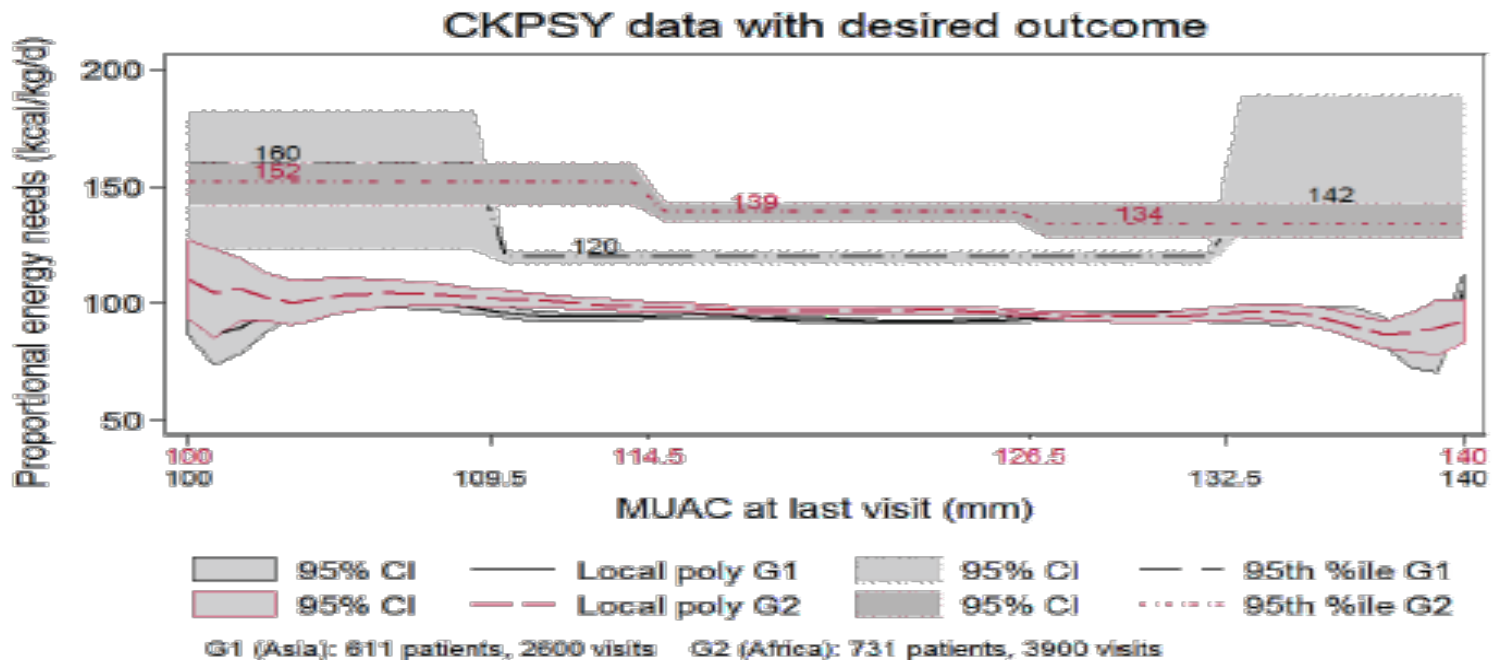


Growth velocity slows as children recover

Key Finding - 2

- As their growth velocity slows, children need fewer kcal/kg/day to achieve observed growth

GRAPH 2: Step function of 95th percentile of proportional energy needs (kilocalories per kilogram weight per day) among subsample of visits among children with the desired outcome

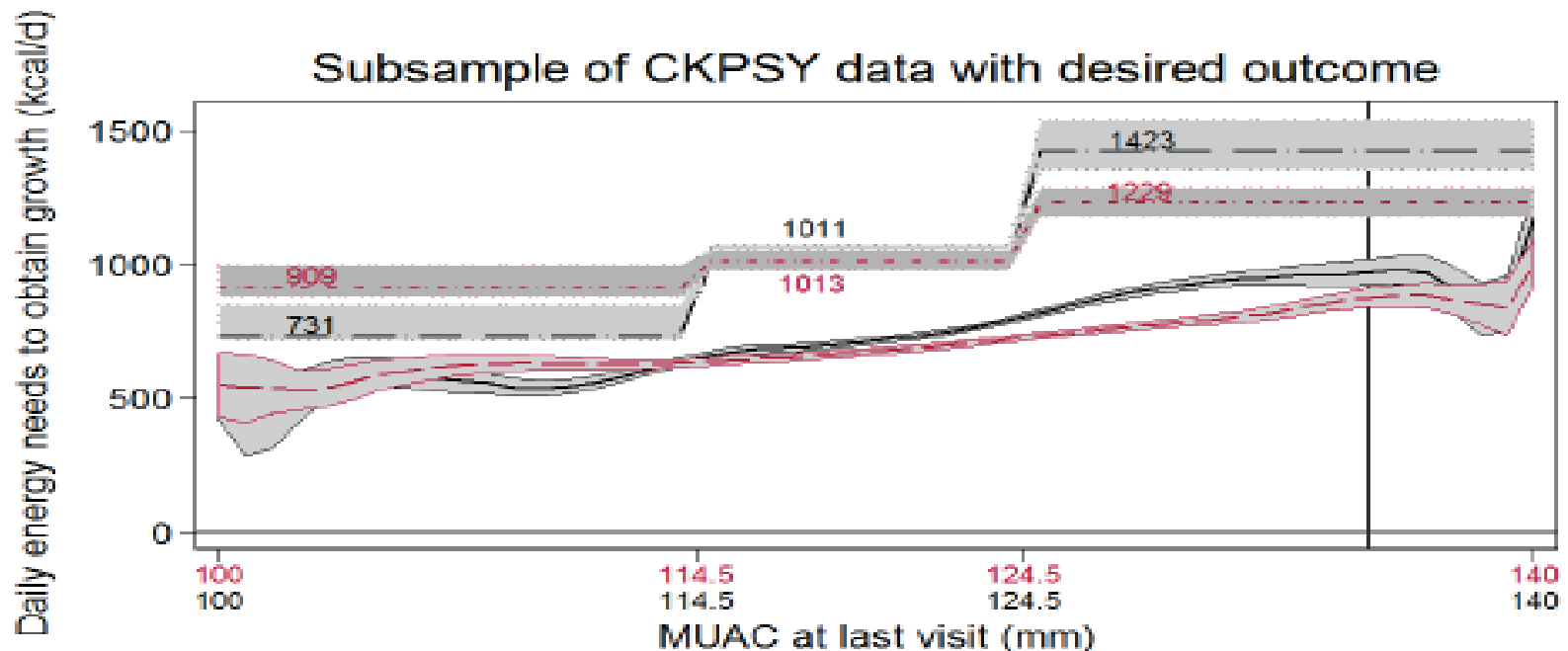


1000 kcal/day covers total energy needs for 95% of children <115mm, and 50% of energy needs for 95% of children 115-<125mm

Key Finding - 3

- Children in Asia respond differently than children in Africa

GRAPH 3: 95th percentile of total energy needs among children in Africa and Asia



95% CI
 Local poly G1
 95% CI
 95th %ile G1
 95% CI
 Local poly G2
 95% CI
 95th %ile G2

G1 (Asia): 811 patients, 2800 visits G2 (Africa): 731 patients, 3900 visits



Proposed Protocol

- Based on our findings, a proposed protocol was designed
- To cover the total energy needs of at least 95% of children presenting with a MUAC under 115mm and
- To cover roughly half the energy needs of at least 95% of children presenting with a MUAC greater than or equal to 115mm and below 125mm

Simplified Protocol

< 115 mm	115- < 125mm
2 RUTF	1 RUTF



Way Forward

Stage - 2- Research Questions

- Piloting of the Combined Protocol: Stage 2 includes two cluster randomized trials in IRC and Action Against Hunger program sites to test the Combined Protocol against the standard treatment of OTP and SFP. We will explore the following research questions:
 - What is the effectiveness, in terms of recovery, defaulter, death, and non-response rates, length of stay, and average weekly weight gain following treatment under the Combined Protocol compared with the standard treatment of OTP +SFP?
 - What is the cost-effectiveness of the Combined Protocol compared to the standard treatment of OTP + SFP?



Thank you!



آغا خان یونیورسٹی
THE AGA KHAN UNIVERSITY



Effectiveness of food/nutrient based interventions to prevent stunting among children in Thatta & Sujawal districts, Sindh

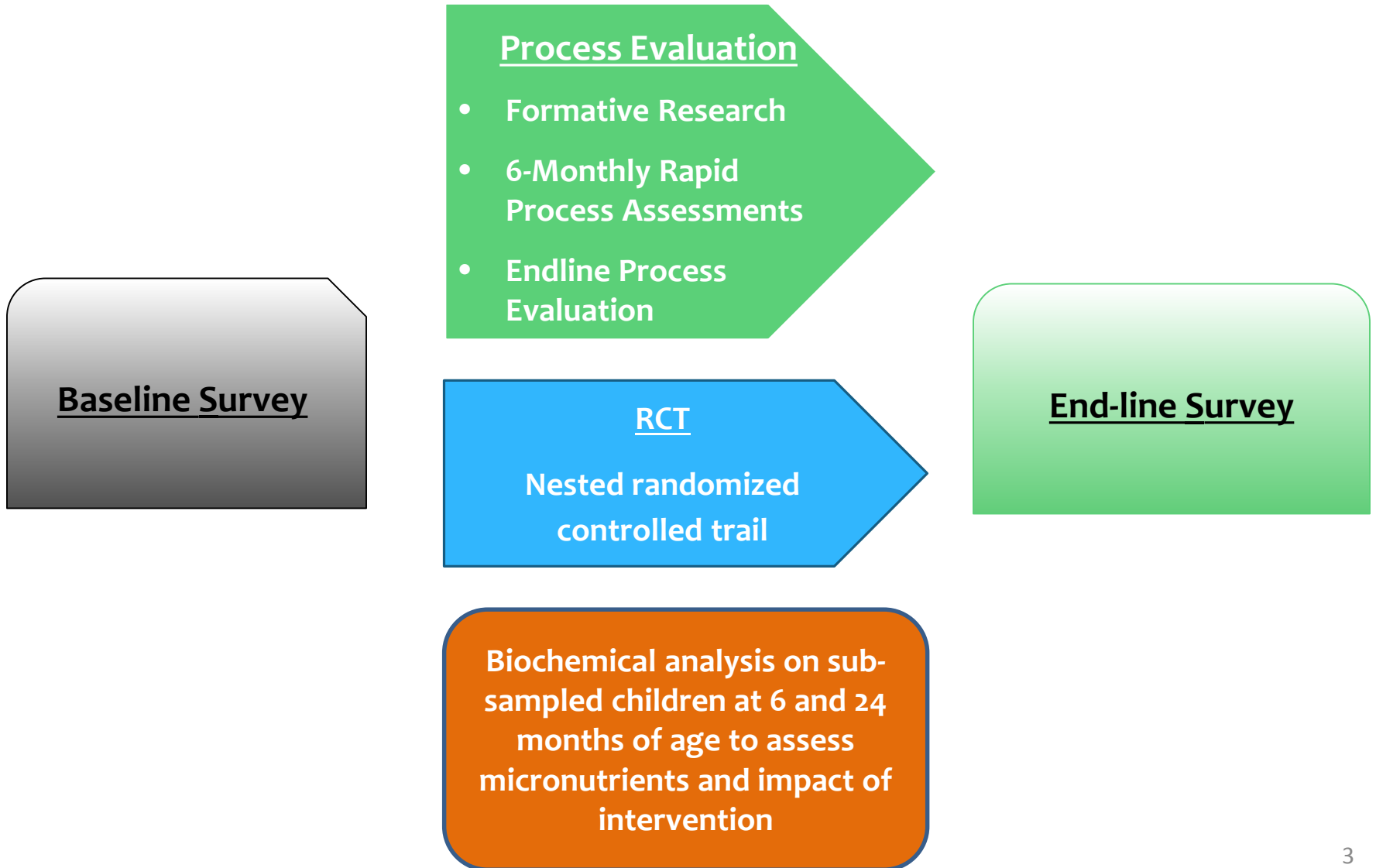
Gul Nawaz Khan
Manager Research

Department of Paediatrics and Child Health
Aga Khan University, Karachi

Study Partners

- World Food Programme (WFP)
- Department of Health, Government of Sindh –
implementing by LHWs Programme
- Department of Paediatrics and Child Health, Aga
Khan University

Approaches of Impact Evaluation



Objectives of Research Components

Baseline & Endline Survey	Randomized Control Trail (RCT)	Process Evaluation
<p>Baseline:</p> <ul style="list-style-type: none"> To provide benchmark indicators and frame work for the implementation of program. <p>Endline:</p> <ul style="list-style-type: none"> To assess the impact of the program, where the nutrition and other core indicators will be compared for pre and post intervention change. 	<ul style="list-style-type: none"> To assess the effectiveness of food/nutrient based interventions (WFP) on reduction of stunting in children under 5 years To utilize the window of opportunity (1000 days) for addressing stunting in children under-two years of age. To assess impact of intervention on low-birth weight. To assess the effectiveness of interventions on reduction of wasting and anemia in PLW To know the optimal length of preventive intervention. 	<ul style="list-style-type: none"> To identify key bottlenecks and opportunities in the program related to: <ul style="list-style-type: none"> - Food distribution - Acceptability - Consumption & proper usage - Food diversity - LHW linkages Expected Utility: Enhancing program effectiveness through ongoing operational improvement

Study Area (29 UCs of Sujawal & Thatta)



Interventions

A blanket approach was used for the distribution of food/nutrient-based supplements.

- **Wheat Soya Blend (WSB):** A monthly ration of 5 kg of WSB was provided to pregnant women during pregnancy and for first 6 months to lactating mothers.
- **Specialized Nutritious Food (SNF):** A locally produced SNF (Wawamum) were distributed to children aged 6-23 months. A daily ration of 50 gram of Wawamum was provided to cover the RDA of most micronutrients and about 1/4 of daily energy requirements.
- **Micronutrient Powders (MNPs):** On alternate day, children aged 24-59 months received a MNPs sachet to obtain the RDA of 15 micronutrients.
- **Behaviour Change Communication (BCC)** by LHWs in routine household visits.

Pictures of WFP Supplements

Super Cereal (WSB+) for PLW



Wawamum (6-23months)



Micronutrient Powder (24-59m)



Nutritional values of WFP Supplements

Ration contents	WSB+	Wawamum	MNP
Daily ration (g/person/day)	167	50	On alternate day
Energy (kcal)	633	260	-
Protein (g)	29.1	6.5	-
Fat (g)	10.2	14.5	-
Calcium (mg)	683	420	-
Iron (mg)	13.9	10.2	10.5
Iodine (µg)	67	102	30
Vitamin A (µg RE)	842	475	400
Thiamine (mg)	0.66	0.83	0.5
Riboflavin (mg)	1.03	0.61	0.5
Niacin (mg NE)	15.3	7.0	6.0
Vitamin C (mg)	169	32	60
<p>Wawamum also includes VitB5 2.75 mg, Vit B6 1.35 mg, Vit B7 1.5 µg, Folic Acid 212.5µg, Vita B12 1.15µg, Vit D 2.33µg, Vit E 8.275mg, Vit K 11.25µg, Ca 445mg, Cu 0.3mg, Iodine 100µg, Iron 9.75 mg, Magnesium 63.75mg, Manganese 0.33mg, Phosphorus 297mg, Potassium 382.5mg, Selenium 14.5µg, Na ≤55mg, Zn 9.75mg . It includes Fatty acid, high quality animal protein (skimmed milk powder) essential for linear growth.</p>			
<p>MNP also includes Vit D3 5µg, Vit E 5mg TE, Vit K1 30µg, Vit B1 0.5mg, Vit B2 0.5mg, Vit B6 0.5mg, Folic acid 90µg, Vit B12 0.9µg, Zinc 2.5mg, Selenium 17µg, Copper 0.34mg.</p>			

Study Indicators

- Demographic and SES
 - Population profile
 - Socioeconomic characteristics
 - Household hunger status
 - Exposure to other interventions
- Anthropometric Indicators
 - Stunting
 - Wasting
 - Underweight
- Feeding Practices & Behaviours
 - Exclusive breastfeeding
 - Breast feeding rates upto 2 years
 - Complementary feeding

Study Indicators

- Anemia levels
 - Anemia in PLW
 - Anemia in children under 5 years
- Maternal BMI
- Antenatal & postnatal care practices
- Low birth weight
- Childhood vaccination status
- Childhood morbidities

Eligible Target Population

- Pregnant women
- Lactating mothers
- Children 6-23 months
- Children 24-59 months

Sample Size for Baseline & Endline Surveys

- **Overall Sample Size = 7,380 subjects**
- **Baseline: May – August, 2014**
- **Endline: Sep – Dec, 2016**

Cluster Randomized Trial

- **Sample size = 5000**
 - 10 clusters (union councils) from 29 targeted UCs.
- **Monthly follow-ups of target groups**
 - PLW and children till 59 months
 - compliance to intervention
 - dietary diversity
 - mortality and morbidities
 - birth outcomes
- **Quarterly follow-ups** for growth outcomes in under-five children and BMI assessments for PLW

Process Evaluation

- Widely scoped and exploratory with the intended utility of informing program design and process monitoring.
 - Formative research at baseline (FGDs, IDIs, HH survey)
 - 6 monthly rapid monitoring assessment
 - FGDs, IDIs and HH survey at end of program
- In-depth information about:
 - the acceptability of program
 - identification of potential barriers
 - supply distribution chain

Key Findings of Baseline Survey

Population Profile

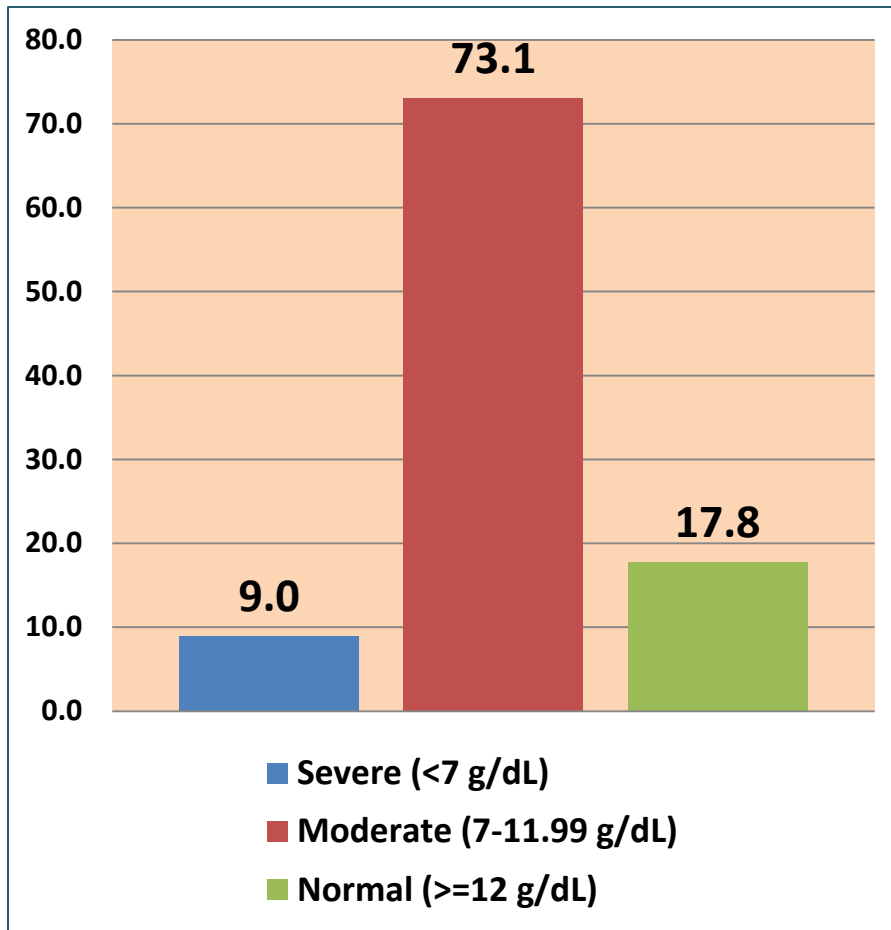
Population Profile	N/rates
Household Surveyed	4,350
Population	28,700
Household density	6.6
Sex Ratio (M:F)	1.03

Socioeconomic Characteristics

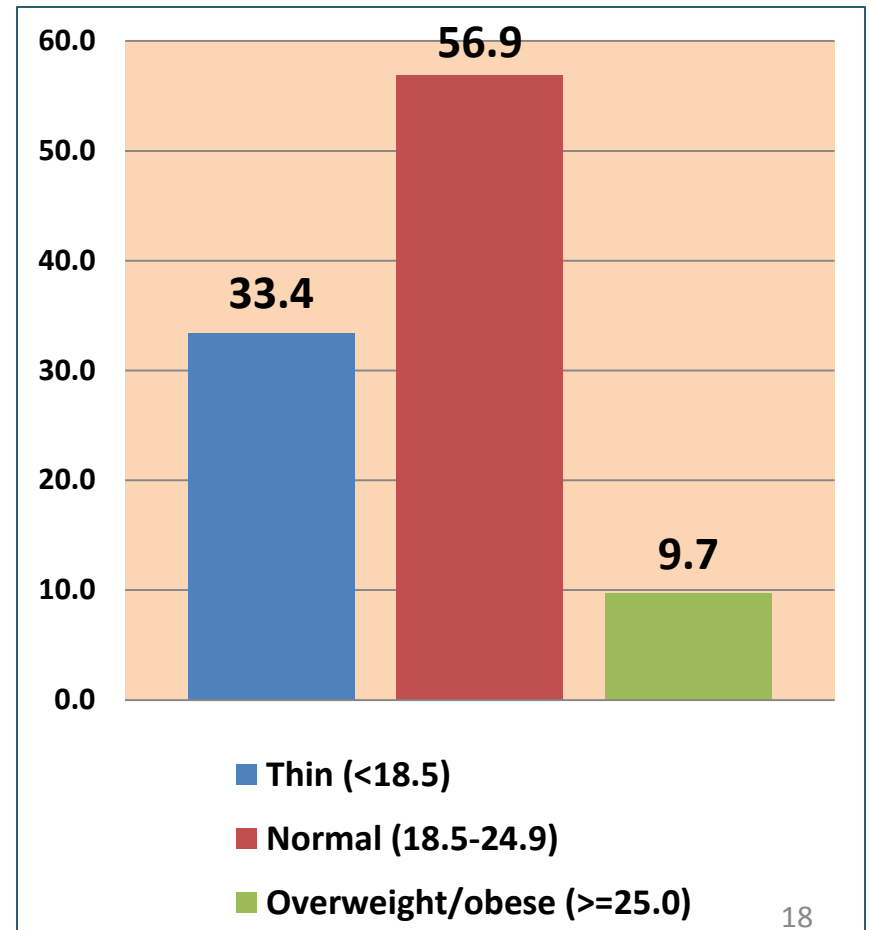
Socioeconomic characteristics	Percent
Illiteracy	76.8
Piped water	25.0
Toilet facilities	43.5
Electricity	68.5
Use of wood as household fuel	90.3
Cemented/finished floor	28.2
Finished roofing	30.9
Finished walls	34.4
Ownership of agricultural land	17.0
Ownership of livestock, animals or poultry	32.1

Maternal Nutrition Status

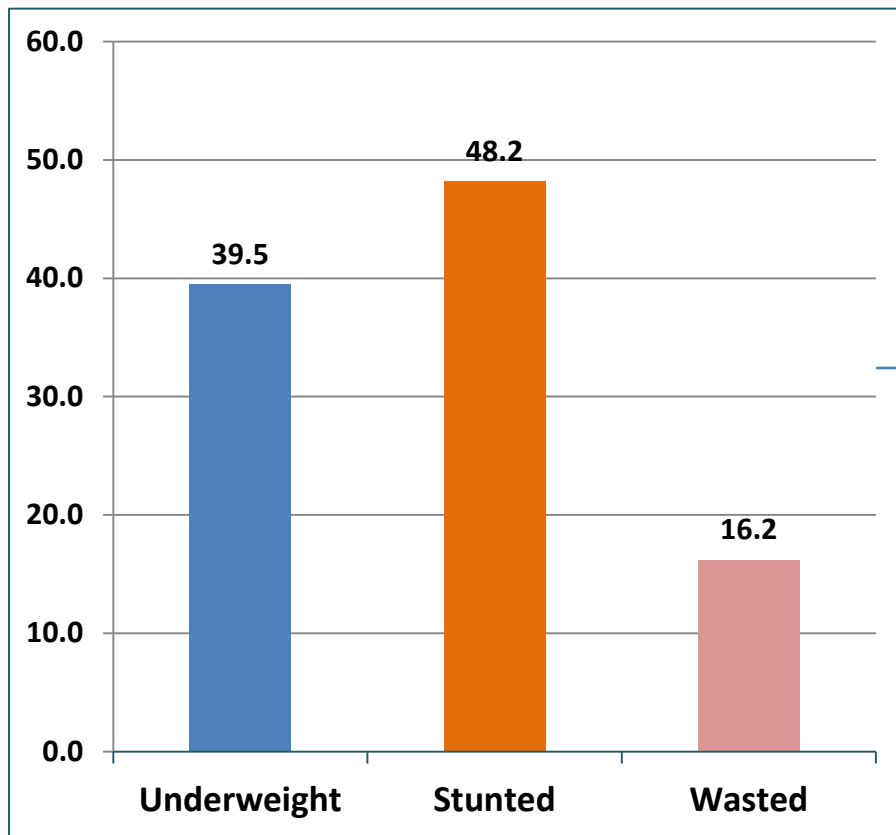
Hemoglobin levels



BMI



Prevalence of Malnutrition

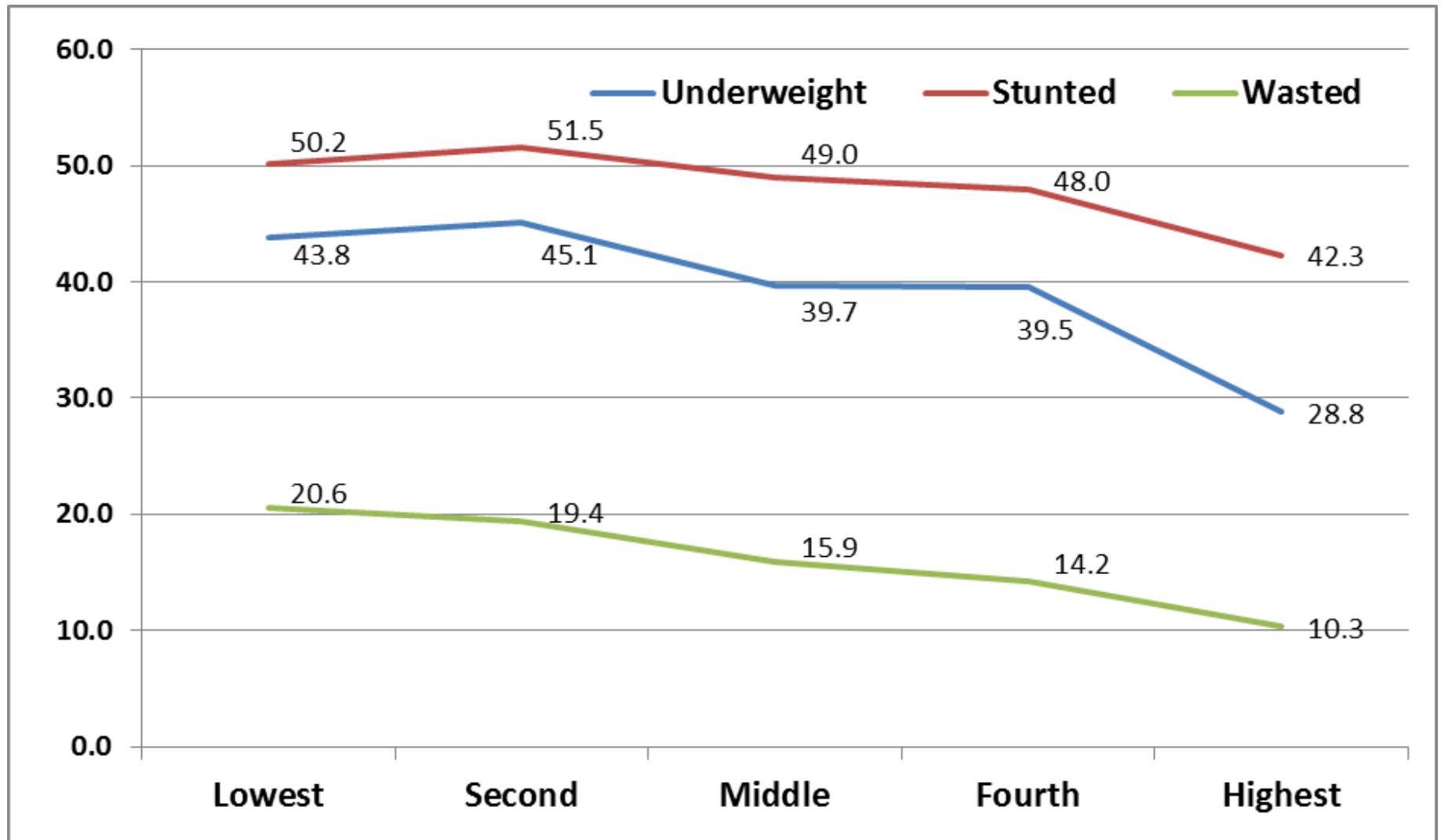


	Underweight	Stunted	Wasted
Boys	40.2	51.3	16.8
Girls	38.7	45.1	15.5

Hemoglobin Levels

	Severe (<7 g/dL)	Moderate ($7-10.99$ g/dL)	Normal (≥ 11 g/dL)
Overall	6.4	80.4	13.2
Boys	6.5	80.3	13.2
Girls	6.4	80.4	13.2

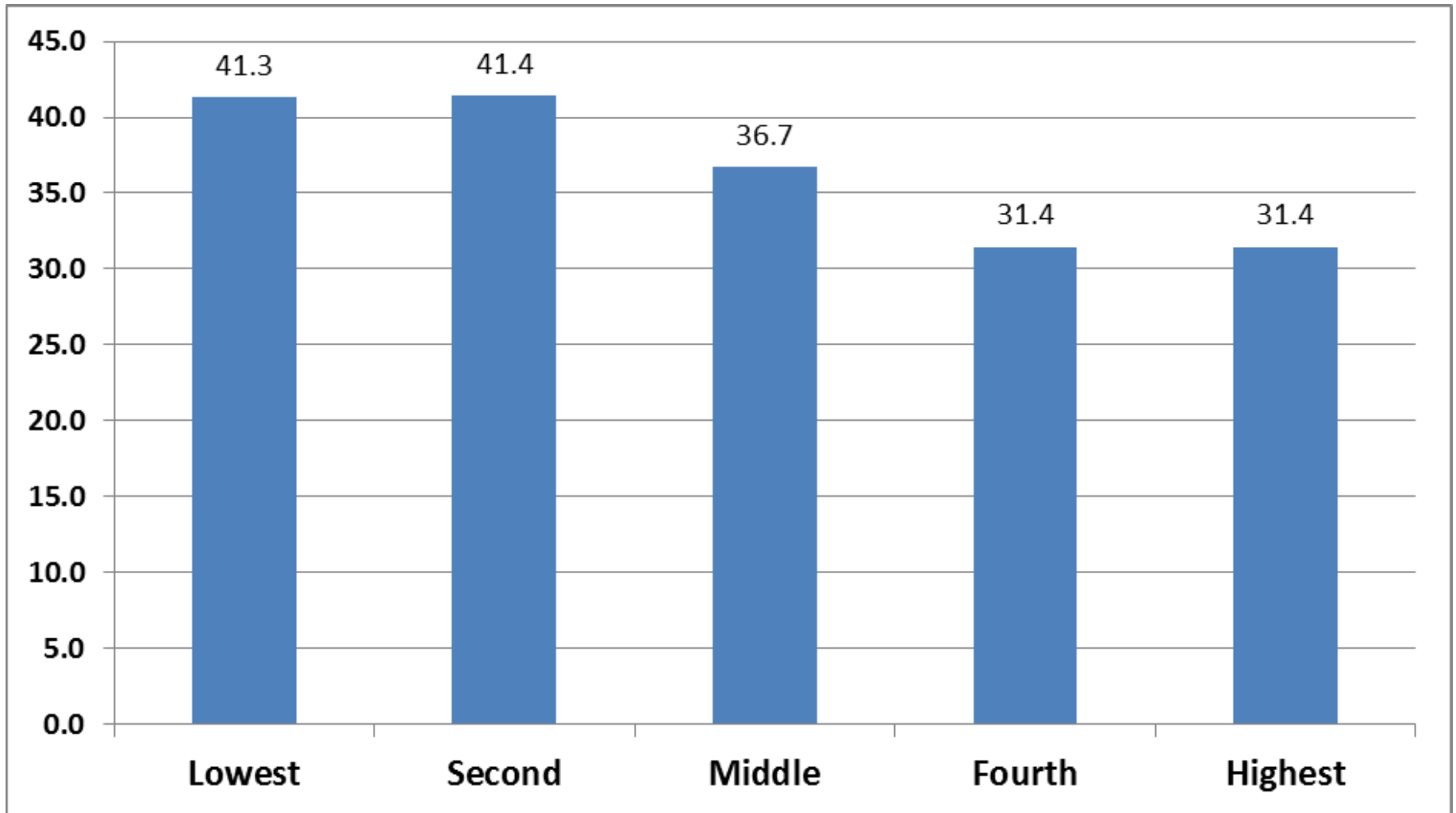
Prevalence of malnutrition by wealth quintiles



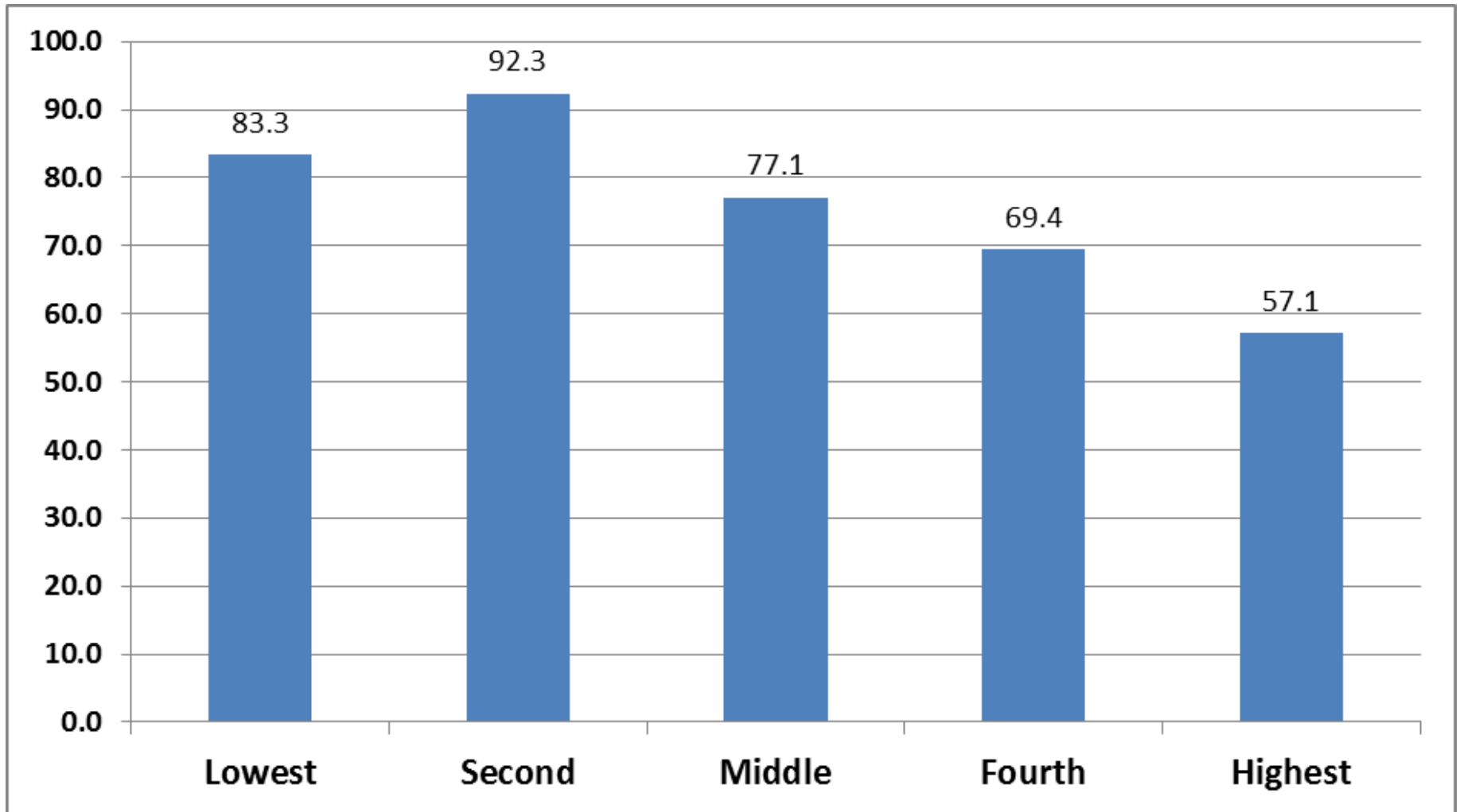
IYCF Practices

IYCF Practices	Percent
Initiation of breastfeeding - within 1 hour	48.8
Exclusive breastfeeding (0-5 m)	36.7
Continued breastfeeding at 2 year	74.6
Introduction of semisolids (6-8 m)	69.9
Minimum meal frequency (6-23 m)	37.7
Minimum dietary diversity (6-23 m)	10.1
Minimum acceptable diet (6-23m)	7.9

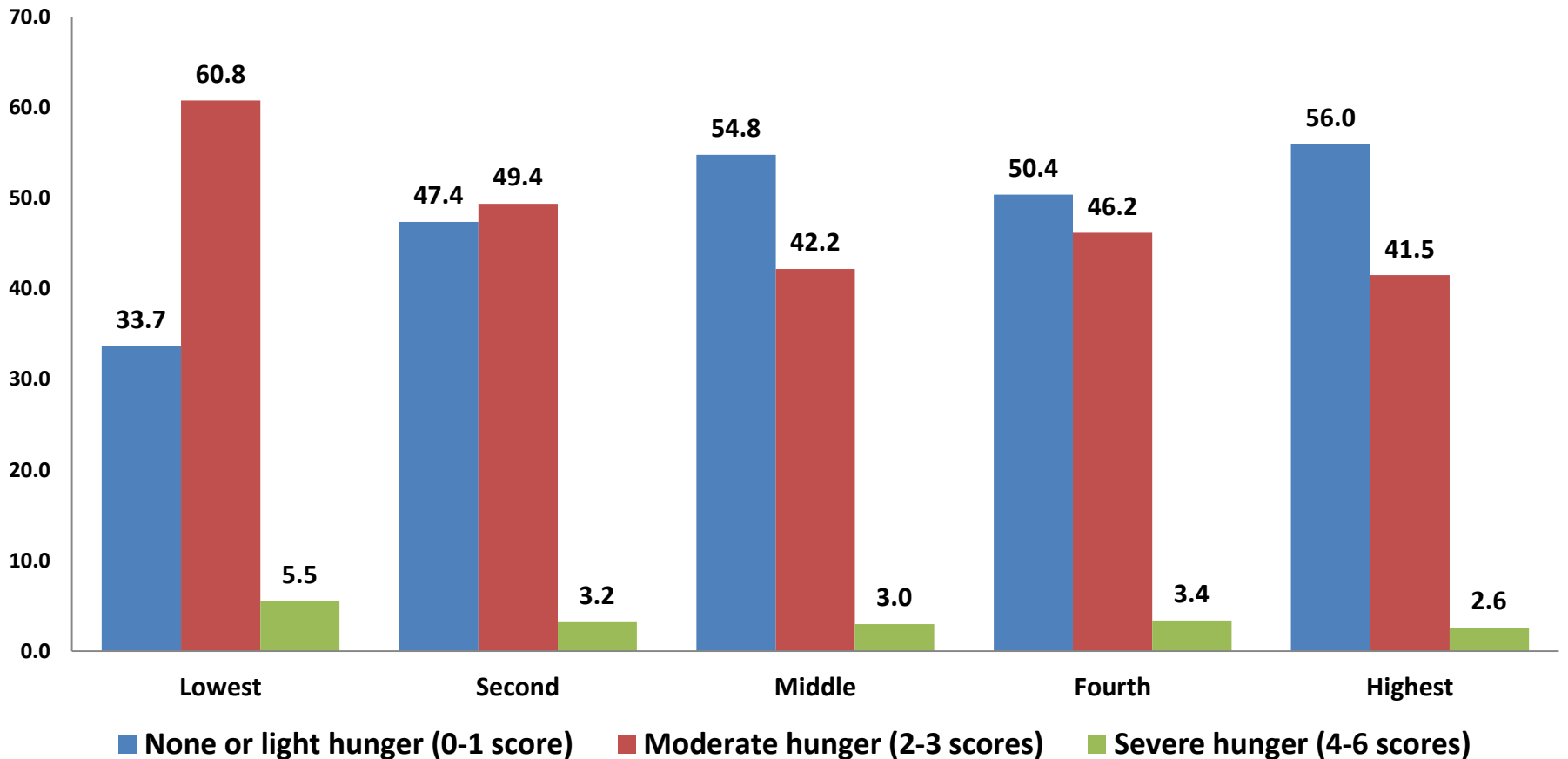
Exclusive breastfeeding at 6 months by wealth quintiles



Continued breastfeeding at 2 years by wealth quintiles



Household hunger scale by wealth quintiles



Childhood Vaccination Status

Type of childhood vaccinations	Percent
BCG	84.3
Polio	96.4
PENTA	73.1
Measles	78.6
Vitamin A	48.8

Conclusion

- The findings of baseline household survey revealed that malnutrition was widespread among the under-five year old children
- IYCF practices were not optimal
- Maternal anemia & BMI levels were also not encouraging
- The findings of endline survey and RCT will suggest key interventions for prevention of stunting

Next Planning

- Sharing of RCT findings with stakeholders - Mar-April 2017
- Sharing of Endline findings with stakeholders - Mar-April 2017
- Completion of 1000-days cohort by Dec 2017 and sharing of findings – Mar, 2018

Thanks

Annex 2 – Agenda

CONFERENCE OPENING – DAY 1		
09:30 – 10:00	Registration	
10:00 - 10:15	Opening Remarks	Shahid Fazal, Action Against Hunger Pakistan
10:15 – 10:45	Keynote Presentation	Silvia Kaufmann, World Bank
10:45 – 11:00	BREAK: Tea and Coffee	
THE PREVENTION OF UNDERNUTRITION IN PAKISTAN		
11:00 – 11:30	<p><i>Measuring the effectiveness and cost-effectiveness of a cash-based transfer programme in reducing the risk of undernutrition in children <5 years and mothers: Research on Food Assistance for Nutritional Impact (REFANI)</i></p> <ul style="list-style-type: none"> • <u>Location</u>: Dadu District, Sindh Province, Pakistan • <u>Partners</u>: Action Against Hunger, ENN 	Bridget Fenn, ENN (virtual)
11:30 – 12:00	<p><i>Assessing and comparing the effectiveness and acceptability of three Point of Use (PoU) water treatment technologies in the context of a community-managed acute malnutrition (CMAM) program: PUR Project</i></p> <ul style="list-style-type: none"> • <u>Location</u>: Dadu District, Sindh Province, Pakistan • <u>Partners</u>: Action Against Hunger, Johns Hopkins University 	Ann Suk, Action Against Hunger
12:00 – 12:45	DISCUSSION: What does this research mean for the prevention of undernutrition in Pakistan?	
CONFERENCE OPENING – DAY 2		
09:30-09:45	Welcome remarks, Summary of Day 1	Shahid Fazal
THE TREATMENT OF UNDERNUTRITION IN PAKISTAN		
09:45 – 10:30	<p><i>Transforming SAM treatment through an exploration of the comparative effectiveness of alternative treatment models, including models that empower community health workers (CHWs) to take a more direct role in service provision: The C-Project</i></p> <ul style="list-style-type: none"> • <u>Location</u>: Dadu District, Sindh Province, Pakistan • <u>Partners</u>: Action Against Hunger, the Innocent Foundation, Aga Khan University 	Imtiaz Hussain, Aga Khan University
10:30 – 10:50	BREAK: Tea and Coffee	
10:50 – 11:30	<p><i>Developing and testing a unified nutritional protocol for the treatment of acute malnutrition (MAM & SAM) to optimize growth and minimize cost at each stage of treatment: Combined Protocol for Acute Malnutrition Study (ComPAS)</i></p> <ul style="list-style-type: none"> • <u>Partners</u>: IRC, Action Against Hunger, EpiCentre, Harvard University 	Shahid Fazal, Action Against Hunger Pakistan
11:30 – 12:00	<p><i>Assessing the effectiveness of food/nutrient-based interventions in preventing stunting among children during the 1,000-day window of opportunity:</i></p> <ul style="list-style-type: none"> • <u>Location</u>: Thatta & Sujawal Districts, Sindh Province • <u>Partners</u>: World Food Programme (WFP), Aga Khan University (AKU) 	Gul Nawaz, Aga Khan University
12:00 – 12:45	DISCUSSION: What does this research mean for the treatment of undernutrition in Pakistan?	
CONFERENCE CLOSURE		
12:45 – 13:00	Closing Remarks	Baseer Achakzai, Ministry of Health, Pakistan
13:00 – 14:00	LUNCH	

Annex 3 – Participant List

63 people attended the panel and called-in, coming from the following organisations:

ACTED
Action Against Hunger
Aga Khan University
Australian High Commission
Cesvi
Concern
ECHO
ENN
FAO
Government of Punjab
Government of Sindh
Harvest Plus
Helvetas Swiss Intercooperation
IFPRI
Malteser International
Mercy Corps
Ministry of Health
National Program
Nutrition Support Program
Oxfam
Pakistan Humanitarian Forum
Save the Children
Tearfund
UNICEF
WaterAid
Welthungerhilfe