



**Centre of Excellence in
Women and Child Health
Aga Khan University**



Advancing newborn and Child Health Agenda: Role of Academia in fostering Public-Private Partnerships and Community engagement

Outline

- **AKU's contribution towards advancing Newborn & Child Health through:**
 - a) Evidence Generation & Knowledge Synthesis
 - Translational Research
 - Research to Policy implications
 - a) Capacity Building & Service Delivery
 - b) Innovation in Newborn & Child Care
 - c) Community Engagement and Partnerships
 - d) Collaboration and Partnerships in Emergency & Conflict Settings
 - e) Advancing Research: Next Generation of Scientists

Outline

- **Public - Private Partnerships**

- a) Community Kangaroo Mother Care –Community Engagement and Advocacy
- b) Possible Serious Bacterial Infection - Primary and Community Health Program (Knowledge Synthesis & Impact)
- c) Reducing Malnutrition – Evidence Synthesis and Policy Implications

AKU Publications in Peer Reviewed Journals

2013 to 2023

Impact Factor (IF) of Journals with AKU Publications in 2023:

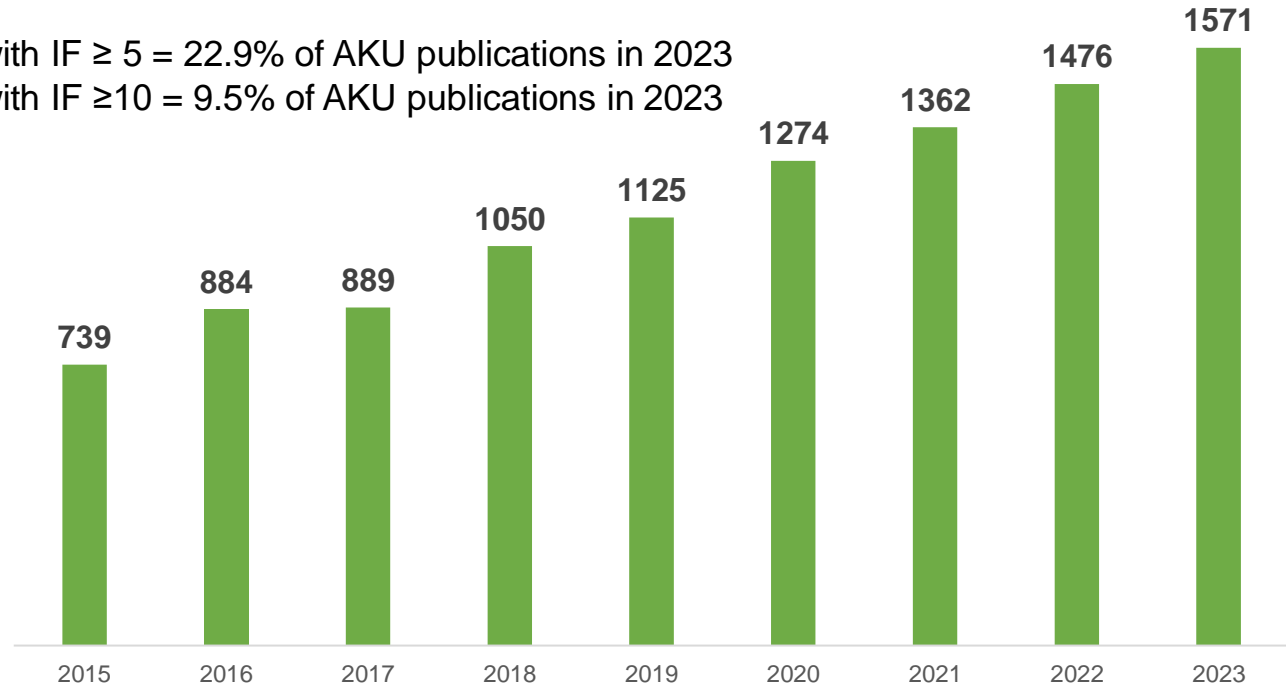
Median IF =3.84

Manuscripts published in journals with IF ≥ 5 = 22.9% of AKU publications in 2023

Manuscripts published in journals with IF ≥ 10 = 9.5% of AKU publications in 2023

AKU faculty members have published at least **160 books** since inception.

12 books and **70 book chapters** were published in 2023.



Societal Impact & Public Discourse:

2023 Research Impact

Aga Khan University research has been **mentioned 25,654 times online**, in a variety of forums in 2023.

- Our research was mentioned in over **3,023 news stories** in 113 countries, including:
 - 56 stories in MSN news
 - 30 stories in Medscape
 - 29 stories in The Conversation
 - 11 stories in CNN News
 - 9 stories in Washington Post
- AKU research influenced **531 policy documents** in 30 countries, including:
 - 411 documents from WHO
 - 16 documents from Food and Agriculture Organisation
 - 16 documents from UNICEF
 - 8 documents from Centers for Disease Control and Prevention



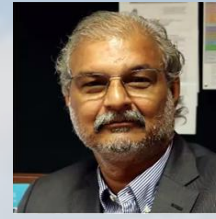
Core Team



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Public-Private Partnerships



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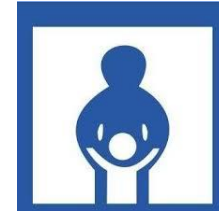
National Partners:



Ministry of National Health,
Pakistan



National Program for Family
Planning and Primary
Healthcare



Expanded Program on
Immunization



Maternal, Newborn and Child
Health Program



Benazir Income Support
Program



Trust for Vaccines & Immunization

Trust for Vaccines and
Immunizations

Global collaborations



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World Health
Organization

World Health
Organization



United Nations
International Children's
Emergency Fund



United Nations
Population Fund



The NIHR Global Health
Research Unit on Respiratory
Health



Action against
Hunger



International Atomic
Energy Agency



Centers for Disease Control
and Prevention



World Food Program

Academia



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Johns Hopkins



Boston University



University of Sydney



IAEA



University of
Melbourne



University of
Edinburgh



All India Institute of Medical
Sciences

शरीरमाद्यं खलु धर्मसाधनम्



Harvard
University



Oxford University

AKU's Contribution Towards Advancing Maternal and Child Health



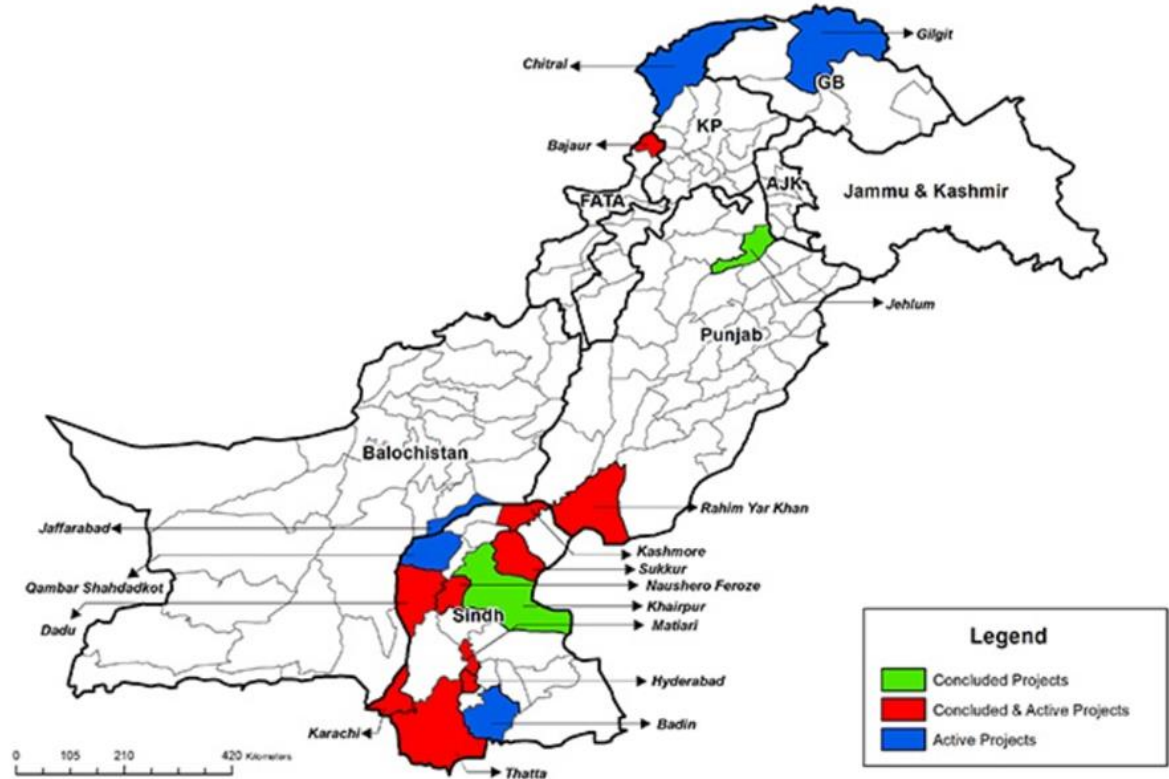
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Evidence Generation



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Research
footprint of
COE-WCH in
Pakistan



Publications



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- Effect of Community-Based Kangaroo Mother Care Package on Neonatal Mortality Among Preterm and Low Birthweight Infants in Rural Pakistan: Protocol for a Cluster Randomized Controlled Trial 2021
- Understanding Perceptions and Practices for Designing an Appropriate Community-Based Kangaroo Mother Care Implementation Package: Qualitative Exploratory Study. 2022

THE LANCET



Causes and incidence of community-acquired serious infections among young children in south Asia (ANISA): an observational cohort study. 2018;



Impact of a community-based intervention package delivered through community health workers on post-partum care practices: a cluster randomized controlled trial. 2024



The World Health Organization ACTION-I (Antenatal Corticosteroids for Improving Outcomes in preterm Newborns) Trial.



Effect of Maternal and Newborn Care Service Package on Perinatal and Newborn Mortality: A Cluster Randomized Clinical Trial. 2024



Maternal vaccination against COVID-19 and neonatal outcomes during Omicron: INTERCOVID-2022 study.



Risk factors for acute diarrhoea in children between 0 and 23 months of age in a peri-urban district of Pakistan: a matched case-control study



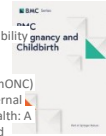
Effect of provision of home-based curative health services by public sector health-care providers on neonatal survival: a community-based cluster-randomised trial in rural Pakistan. 2017



Evaluation of health workforce competence in maternal and neonatal issues in public health sector of Pakistan: an Assessment of their training needs



The Effectiveness of Nutritional Interventions Implemented through Lady Health Workers on the Reduction of Stunting in Children under 5 in Pakistan: The Difference-in-Difference Analysis. 2024



Improved accessibility of emergency obstetrics and newborn care (EmONC) services for maternal and newborn health: A community based project 2013.



Determinants of Stunting among Children under Five in Pakistan. 2023

Quality improvement initiative using transcutaneous bilirubin nomogram to decrease serum bilirubin sampling in low-risk babies. 2019



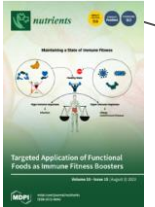
Determinants of infant and young child feeding practices by mothers in two rural districts of Sindh, Pakistan: a cross-sectional survey. 2017



Effectiveness of nutritional supplementation during the first 1000- of life to reduce child undernutrition: A cluster randomized controlled trial in Pakistan. 2022



World Health Organization recommendations for care of preterm or low birth weight infants: health policy.



Targeted Application of Functional Foods in Intensive Fitness Routines

Community Engagement

The COE in Women and Child Health has been working to improve the health of women and children in Pakistan by creating synergies among various stakeholders including the community members.



Awareness

AKU introduced the idea of **KMC champions** to promote peer-to-peer learning amongst community members.



Engagement & Ownership

Village Health Committees & Women Support Groups were developed during the Umeed-e-Nau project to encourage community ownership.



Trust Building

AKU conducts regular **stakeholder meetings and dissemination activities** to build trust among community members and partners.

Evidence Generation & Knowledge Synthesis

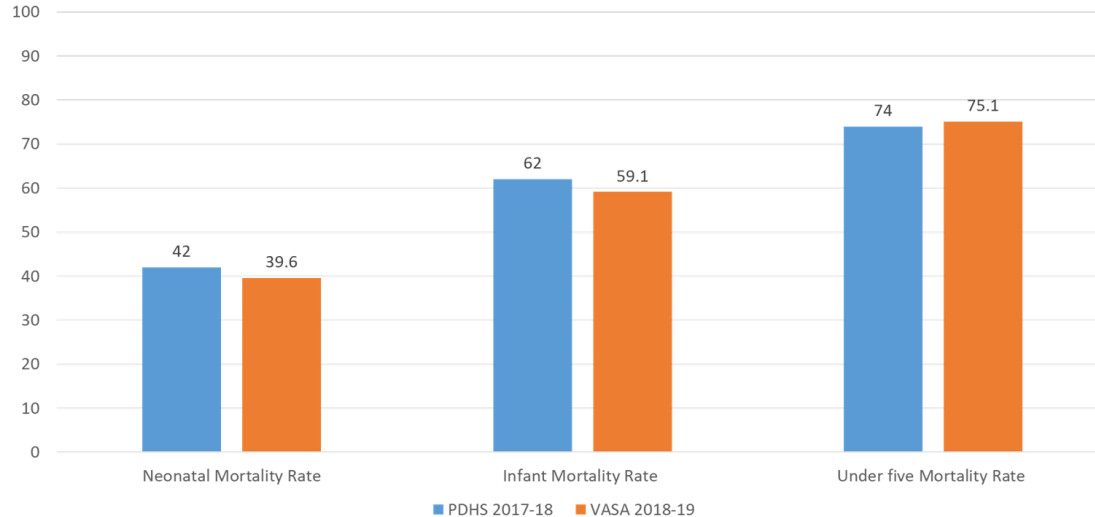


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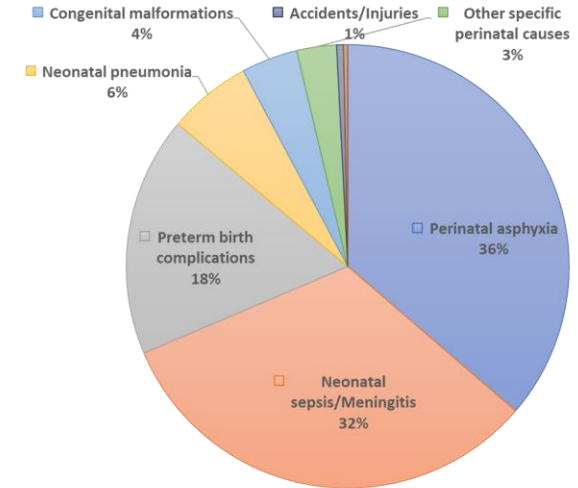


JOHNS HOPKINS
UNIVERSITY

Population based Verbal and Social Autopsy Study to Estimates burden and Causes of Mortality in Pakistan



Comparison of Mortality Rates
PDHS Data vs VASA



Causes of Neonatal Mortality (n=2088)
VASA

Evidence Generation & Community Engagement



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Impact of Community-based Interventions Package on Perinatal & Newborn Mortality delivered through LHWs & TBAs in Rural Pakistan:
A Cluster-Randomized Effectiveness Trial



World Health Organization

THE LANCET
Global Health

Improvement of perinatal and newborn care in rural Pakistan through community-based strategies: a cluster-randomised effectiveness trial

Zulfiqar A Bhutta, Sajid Soofi, Simon Cousens, Shah Mohammad, Zahid A Memon, Imran Ali, Asher Feroze, Farrukh Raza, Amanullah Khan, Steve Wall, Jose Martinez

Effect of provision of home-based curative health services by public sector health-care providers on neonatal survival: a community-based cluster-randomised trial in rural Pakistan

[Sajid Soofi, FCSP^a](#) · [Prof Simon Cousens, DipMathStats^b](#) · [Ali Turab, MPH^a](#) · [Yaqub Wasan, MA^a](#) · [Shah Mohammed, MPH^a](#) · [Shabina Ariff, FCSP^a](#) · [Zaid Bhatti, MSc^a](#) · [Imran Ahmed, MSc^a](#) · [Steve Wall, FAAP^c](#) · [Prof Zulfiqar A Bhutta, PhD^{a,d}](#)  [Show less](#)



LHW Delivering a Session to Community Members

Innovations and Impact through Knowledge Synthesis



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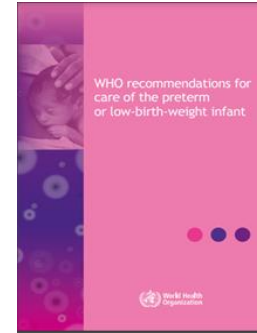
© 2011 Chlorhexidine Neonatal Care Program
Courtesy of GHSP Journal

Topical application of chlorhexidine to neonatal umbilical cords for prevention of omphalitis and neonatal mortality in a rural district of Pakistan: a community-based, cluster-randomised trial

[Sajid Soofi, FCPS^a](#) · [Prof Simon Cousens, Dip MathsStats^{a,b}](#) · [Aamer Imdad, MBBS^a](#) · [Naveed Bhutto, MBBS^a](#) · [Nabeela Ali, MPH^c](#) · [Prof Zulfiqar A Bhutta, PhD^{a,b}](#) ✉

Umbilical cord care through community-based distribution of chlorhexidine in rural Sindh, Pakistan FREE

M Shah ✉, Q Jamali, F Aisha



Antenatal Dexamethasone for Early Preterm Birth in Low-Resource Countries

Author: The WHO ACTION Trials Collaborators [Author Info & Affiliations](#)

Evidence Generation & Knowledge Synthesis



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The Effectiveness of Nutritional Interventions Implemented through LHWs on the Reduction of Stunting in Children under 5 in Pakistan: The Difference-in-Difference Analysis

Intervention (LHW coverage areas)

Pregnant women (WSB and BCC)
Lactating women (mothers of children 0–6 m WSB and BCC)
6–23 months Wawamum and BCC for caregivers
24–59 months MNPs and BCC for caregivers
+ongoing public sector programmes

Control (LHW uncovered areas) Regular public sector public health programs

Inclusion criteria

- Residents of 29 Union councils / Talukas
- All pregnant women
- All lactating women up to 6 months post-partum
- All children 6–59 months old

Exclusion criteria

- Non residents / visitors of the selected 29 Union councils / Talukas
- Within the 29 Union Councils / Talukas children 60 months or more

	Baseline		Endline	
	Intervention	Control	Intervention	Control
Union Councils sampled	n=29	n=29	n=29	n=29
Total population size	n=16,431	n=12,269	n=16,006	n=14,959
Interviews completed	n=1832	n=1565	n=1650	n=1627



Collaboration with RMNCH -UNICEF -WFP



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Nutritional Interventions

Project	Period & Status	Locations	Funded By
Impact assessment of Benazir <u>Nashonuma</u> Programme to Improve Maternal and Child Nutritional Status	2021-2024 Ongoing	<u>Dadu & Naushahro Feroze</u> , Sindh Rajanpur & Bahawalnagar, Punjab	BMGF
Women supporting women using local solutions to improve infant and young child feeding and care practices	2021-26 Ongoing	District Rahim Yar Khan, Punjab	Canadian Institutes of Health Research (CIHR)
Effectiveness of specialized nutritious foods, social and behaviour change communication interventions to prevent stunting among children	2020-2023 Ongoing	Badakhshan, Afghanistan	WFP Afghanistan
Effectiveness of food/nutrient-based interventions to prevent stunting among children	2014-2019 completed	Districts Thatta and Sujawal , Sindh	WFP Pakistan
Effectiveness of a programme comprised of specialized nutritious food, cash-based transfers and behaviour change communication interventions to prevent stunting among children 6-24 months of age	2016-2019 completed	District Rahim Yar Khan, Punjab	WFP Pakistan
Evidence generation related to stunting prevention through multisectoral approaches coupled with appropriate complementary practices	2017-2021 completed	District Pishin, Balochistan	WFP Pakistan
Scaling up evidence-based nutrition interventions to address maternal and child health outcomes in Pakistan	2007-2009 completed	District Naushero Feroze, Sindh	Micronutrient Initiative
Monitoring and Evaluation of a micronutrient (sprinkles) supplementation program and its impact	2008 completed	District Naushero Feroze, Sindh	Micronutrient Initiative
KAP Survey on Iodized Salt Utilization in two Provinces of Pakistan	2006-07 completed	Two provinces of Pakistan (Punjab and Sindh)	UNICEF Pakistan

Contributions in global research



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The COE - WCH regularly works towards expanding its research footprint and generates evidence that can advance maternal and child health globally.

1) Systematic Reviews

We have conducted systematic reviews focused on evaluating treatment strategies and interventions for on maternal newborn and children with specific health conditions.

- Effectiveness of probiotics for diarrhoea,
- DKA
- Delivering nutrition interventions to women and children in conflict settings: a systematic review.
- Pneumonia and pulse oximetry
- Climate change policy and impact on Asthma & COPD



Cochrane

Newborn resuscitation HBB -Capacity Building



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Helping Babies Breathe (HBB)

- Simplified educational tool for newborn resuscitation through primary health care providers in low and middle income settings
- Ensure the presence of skilled care provider
- Early recognition of intrapartum asphyxia
- Management through ventilation (Bag & Mask)
- Stabilization of the newborn
- Referral when required



AKU CIME Neonatal Resuscitation Program

- Recognise the signs and symptoms of a neonate in cardio respiratory distress.
- Explain the indication for and perform the steps of neonatal resuscitation.
- Perform effective airway management.
- Explain the indication and contraindications of medications used during neonatal resuscitation.

Capacity Building & Service Delivery



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Capacity building of facility-based HCPs and community-based HCPs (lady health supervisors (LHS) and LHWs) was conducted to roll out maternal and child health interventions in 09 Districts

Review of the existing training curriculum to identify gaps



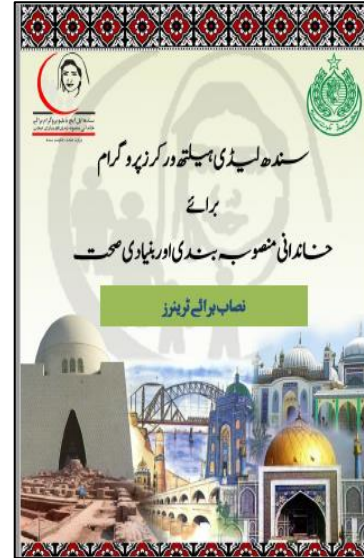
HCPs and LHS trained as Master Trainers and mentors for LHWs



User-friendly curriculum/guide developed against existing large content



Quality assessment of training using pre- and post tests



Revised and Updated Sindh LHWs curriculum

Service Delivery in Emergency Settings



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Playing a crucial role in crisis response, ensuring continuous healthcare delivery during emergencies like COVID-19 and floods through collaboration and mass-scale collaboration.



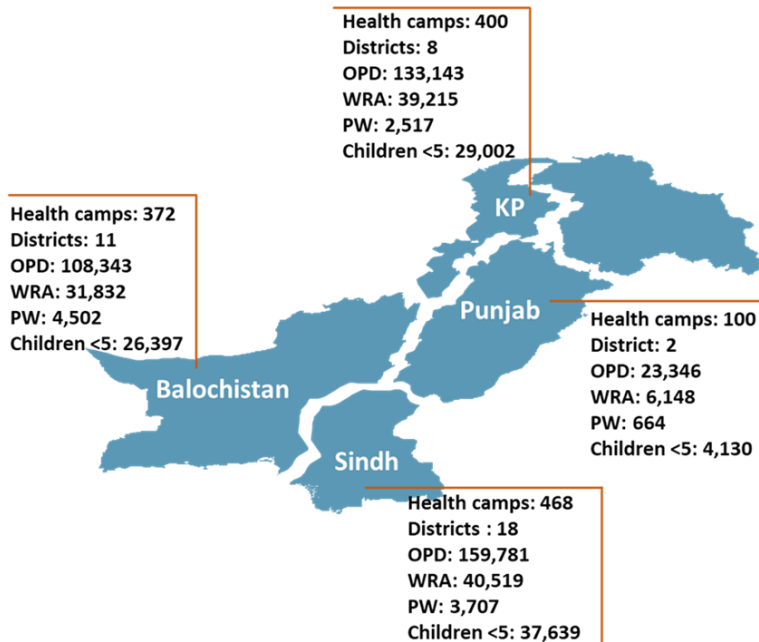
- In **42** flood-affected districts of Pakistan, **1,059** camps provided **314,635** outpatient services, treating **76,425** women, and **70,461** under five. **39,087** children were vaccinated for essential immunization
- General health screening, treatment and provision of medicines
- Advocacy sessions on prevention of water-borne diseases and menstrual hygiene management were conducted



Service Delivery in Emergency Settings

Flood Response in Numbers

- Health Camps
1,340
- Districts reached
40
- People facilitated in OPD
428,304
- Women of reproductive age (WRA)
Provided health services
119,301
- Pregnant women (PW) served
11,702
- WRA vaccinated
15,124
- Children < 5 years of
age covered
97,168
- Children vaccinated
37,970
- Children given OPV drops
47,376



Districts	Number of Camps
Harnai	43
Jafferabad	43
Jhal Magsi	43
Kachi	43
Nasirabad	43
Pishin	43
Sohbatpur	42
Charsadda	50
D I Khan	50
Dir Lower	50
Nowshera	50
Peshawar	50
Shangla	50
Swat	50
Tank	50
DG Khan	50
Rajapur	50
Badin	25
Dadu	50
Jamshoro	25
Karachi-Central	2
Karachi-East	13
Karachi-Kemari	6
Karachi-Korangi	2
Karachi-Malir	9
Karachi-South	3
Karachi-West	7
Kashmore	25
Khairpur	50
Naushahro Feroze	52
Qambar Shahdadkot	52
Sanghar	26
Shaheed Benazir Abad	25
Shikarpur	25

Service Delivery in Emergency Settings



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Registration area, all patients are registered here & daily patient record sheet is provided



Male waiting area, once registered, patients will wait in male/female waiting areas



Female waiting area



Male OPD area while MO taking the blood pressure of the patient



Female OPD area while MO taking the history of the patient



Vaccination Desk



Nutrition Corner



Pharmacy/Dispensary

District Dadu-Flood Affected-SRC X AKU



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Intervention Package

Infrastructure support-
renovation, equipment,
instruments

Provision of staff -
gynecologist, pediatrician,
anesthetists,
paramedics, OT
technicians, LHVs

Capacity Building-
Trainings and follow-up
refresher for
Health facility staff
including MO, LHVs, govt.
LHW,

Supplies- Initial medicines supply, and
regular replenishment through links



In Facilities
5 BHUs, 1 THQ



In Communities
Population of 5 UCs

Support groups- To
mobilize community for
uptake of women health
services.

Increasing access-
home visits and phone
counselling

**Orientation organized for
Traditional birth
attendants-**
for recognition of danger
signs and timely referral.

Community health committee (CHC)-
established with BHU staff and
community members



Pandemic SARS



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THE LANCET
Global Health

Pregnancy outcomes and vaccine effectiveness during the period of omicron as the variant of concern, INTERCOVID-2022:
A multinational, observational study



Maternal and Neonatal Morbidity and Mortality Among Pregnant Women With and Without COVID-19 Infection-global study

JN JAMA Network

DAWN

KARACHI: Pregnant women who contract Covid-19 are 22 times more likely to die and 50 per cent more likely to experience pregnancy-related complications than expecting women unaffected by Covid-19, says a global study of over 2,100 pregnant women across 18 countries, including Pakistan, published in JAMA Paediatrics.

Next Generation of Scientists



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Dr. Hareem Fatima



Dr. Asma Qureshi



Dr. Mariam Zuberi



Ridwa Alam



Ahmad Khan



**Dr. Nimra
Shahid**



**Fareeha
Javaid**



**Fizza
Amir**



**Aqsa
Shaikh**



**Dr. Muhammad
Talal**

Successful Models of community engagement



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c-KMC - Community Mobilization



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As part of community mobilization:

- Trainings of Community and Facility-level Providers was conducted
- One-to-one and group sessions with flip-cards, wall mounts, and self-explanatory video to maximize use of KMC in intervention clusters. Peer to peer learning through KMC champions was also practiced in the intervention clusters.



c-KMC - Impact



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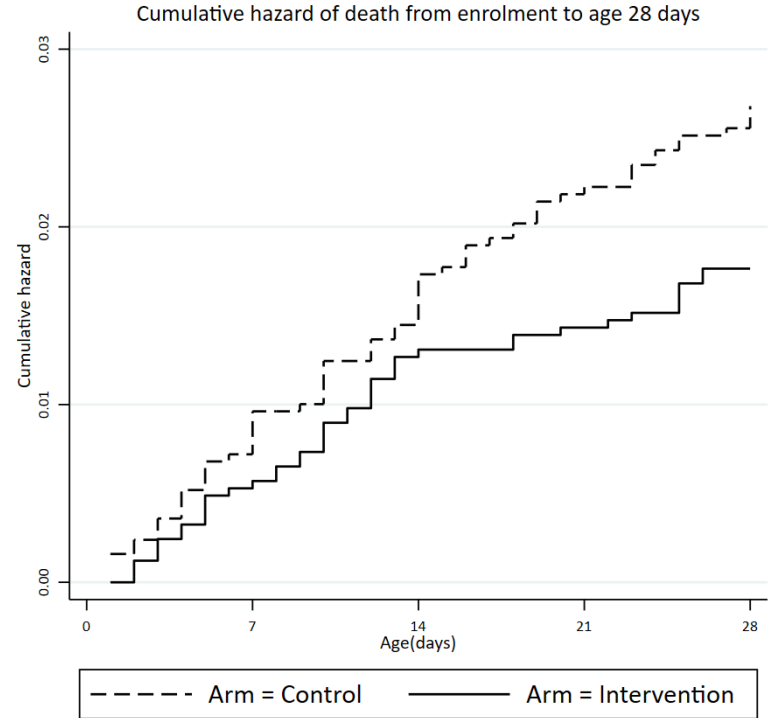
Neonatal deaths,

-In intervention clusters: 43 (1.7%)

-In control clusters: 66 (2.6%)

The risk of neonatal mortality was **lower** in intervention clusters (HR:0.66, 95% CI:0.44-0.99, $p=0.045$)

Neonates who received KMC had **59% lower risk of PSBI** at 28 days than neonates who did not receive KMC



PSBI - Introduction



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- PSBI, in the neonatal and young infant are a global health issue and a major cause of mortality
- An estimated 6.9 million newborns identified and treated for PSBI each year in sub-Saharan Africa, Latin America and South Asia ,and over 500000 deaths globally
- The incidence of PSBI reported in the urban settings of Pakistan is~112 per 1000 live births
- The standard management of PSBI by WHO includes inpatient care using injectable antibiotics (penicillin or ampicillin plus gentamicin for 7–10 days)
- Not feasible for resource limited settings, including Pakistan, refusal to hospital referral may be as high as 75%



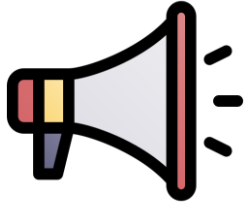
PSBI - Challenges



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**Limited Access to
Health Care
Facilities**



**Lack of Awareness
& Delayed Care-
Seeking Behaviour**



**Unavailability of
PSBI Services &
Treatments**



**Inadequate
Physician
Performance and
Lack of Adherence
to Guidelines**



**Antibiotic
Resistance**



**Reluctance to Use
Intramuscular
Injections**

Public Private Partnerships

Continuous Monitoring and Evaluation

AKU's Efforts in Addressing PSBI



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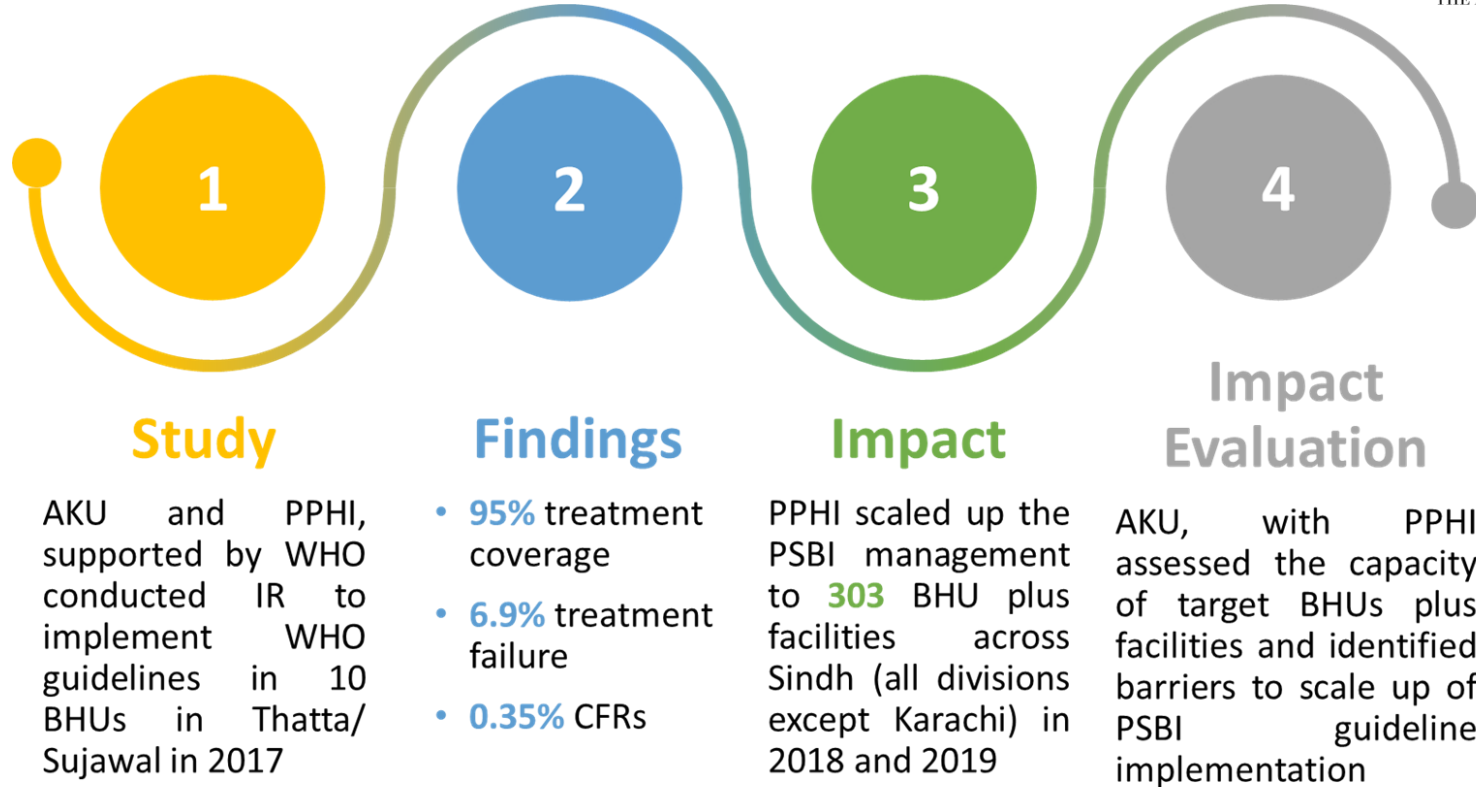
- Implemented a successful public private partnership for Possible Severe Bacterial Infections.
- Leverage resources and expertise from all stakeholders
- Bridge gaps in funding, expand coverage and evidence generation at real life scenarios
- Enhance the efficiency of delivering healthcare solutions where needed most.

Partners: PPHI, WHO, and the LHW Program

AKU's Efforts in Addressing PSBI



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PSBI - Outcomes of Partnership

- Management of sick young infants with Possible Serious Bacterial Infection (PSBI) where referral is not possible.
- **Implementation Research**
 - To identify 80% or more of sick young infants in the study area.
 - 80% or more of sick young infants with PSBI should receive appropriate treatment.
 - How to achieve the above programmatic objectives within the existing primary health care system through public private partnership

Technical Support Units



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- Coordination amongst stakeholders
- Capacity building of LHW
- Capacity building of BHU staff
- 20% validation of case management
- Monitoring and Evaluation
- Evidence generation





Community Outreach Activities - LHW Program

- Pregnancy surveillance and registration
- Postnatal home visits (1, 3, 7 & 28 days of life)
 - Assessment of newborn and YI, recognition of danger signs
 - Referral to BHU if danger signs present
 - Follow up visits at household level
 - Community awareness sessions





Implementation Partner: PPHI

- Service delivery at Primary Health Care (PHC)
- Leadership, motivate staff and share examples of best practices
- Assessment, diagnosis and treatment of PSBI cases and refer for inpatient care.
- Administer pre-referral treatment if referral accepted.
- Simplified antibiotic treatment if referral is refused.
- Follow up at BHU on day 4, 8 and 14.
- Counseling & reinforcement for compliance to treatment and follow up.





Technical Support: WHO

PSBI – Young infant IMNCI - Training of Trainers

- Share existing evidence
- Technical support
- Capacity building of all stakeholders
- National level Training of Trainer model



Key Achievements



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HCWs were able to recognize, classify and treat patients in ambulatory settings.

Patients were managed and treated at BHUs including patients with CSI (80.4%), Severe Pneumonia (93.8%), and Critical Illness (94.6%).

0% mortality recorded amongst treated patients.

PSBI Guideline Implementation



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- Post-research, PPHI scaled up the PSBI management to 303 BHU plus facilities across Sindh (all divisions except Karachi) in 2018 and 2019

- AKU, in collaboration with PPHI assessed the capacity of target BHU plus facilities and identified barriers to scale up of PSBI guideline implementation



PSBI Contribution Towards Policy Making



Implementation and scale-up of WHO PSBI guidelines:

- Provided evidence on efficacy to policy makers and HCWs
- Informed evidence on health systems requirements to implement outpatient treatment for PSBI
- Formed the basis of policy dialogue by stakeholders at national level to implement outpatient treatment of PSBI thereby reducing neonatal and infant mortality resulting from infection.

Interventions leading to the Prime Minister Stunting Initiative Program through Social Programs (Income Support Program for marginalized populations)



- Effectiveness of Nutritional Supplementation during the First 1000 days of Life to reduce Child Undernutrition: A Cluster Randomized Controlled Trial in Pakistan

Objective

To assess the effectiveness of different nutrition-based supplements on nutritional outcomes in both women and their children during the first 1000-days of life.

Primary Outcome

- Reduction in the prevalence of child stunting at 24 months of age.

Secondary Outcomes

- Improvement in mean length, weight, length-for-age Z-scores, weight-for-age Z-scores, and weight-for-length Z-scores.
- Reduction in the proportion of underweight and wasting.
- Improvement in infant and young child feeding practices.

Intervention package and delivery

- Pregnant women received a monthly supply of 5 kg of wheat soya blend plus (WSB+) during pregnancy and the first six months of their lactation period.

The WSB+ consisted of partially cooked wheat and soya beans fortified with vitamins and minerals.

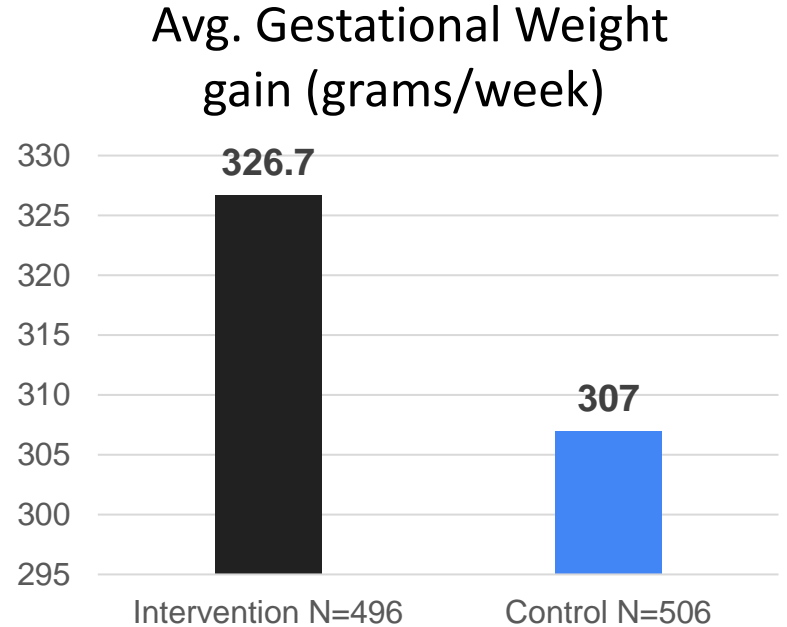
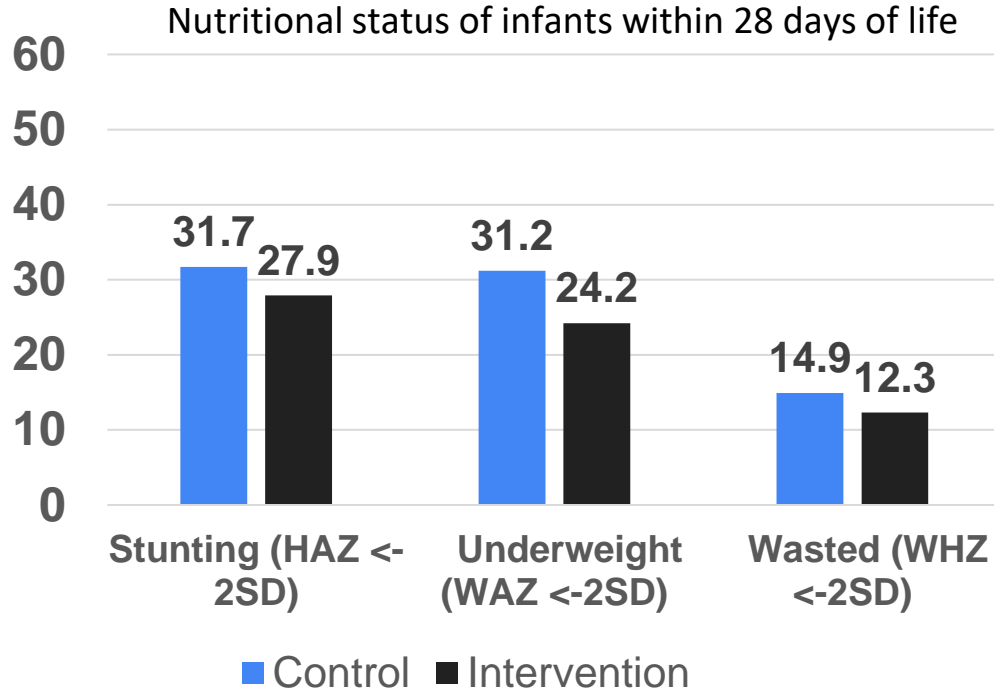
- Infants received lipid-based nutrient supplement - medium-quantity (LNS-MQ) between 6-23 months of age.

LNS-MQ was prepared with roasted chickpeas, vegetable oils, dry skimmed milk, sugar, vitamins, and minerals, recommended emulsifier, and antioxidants.

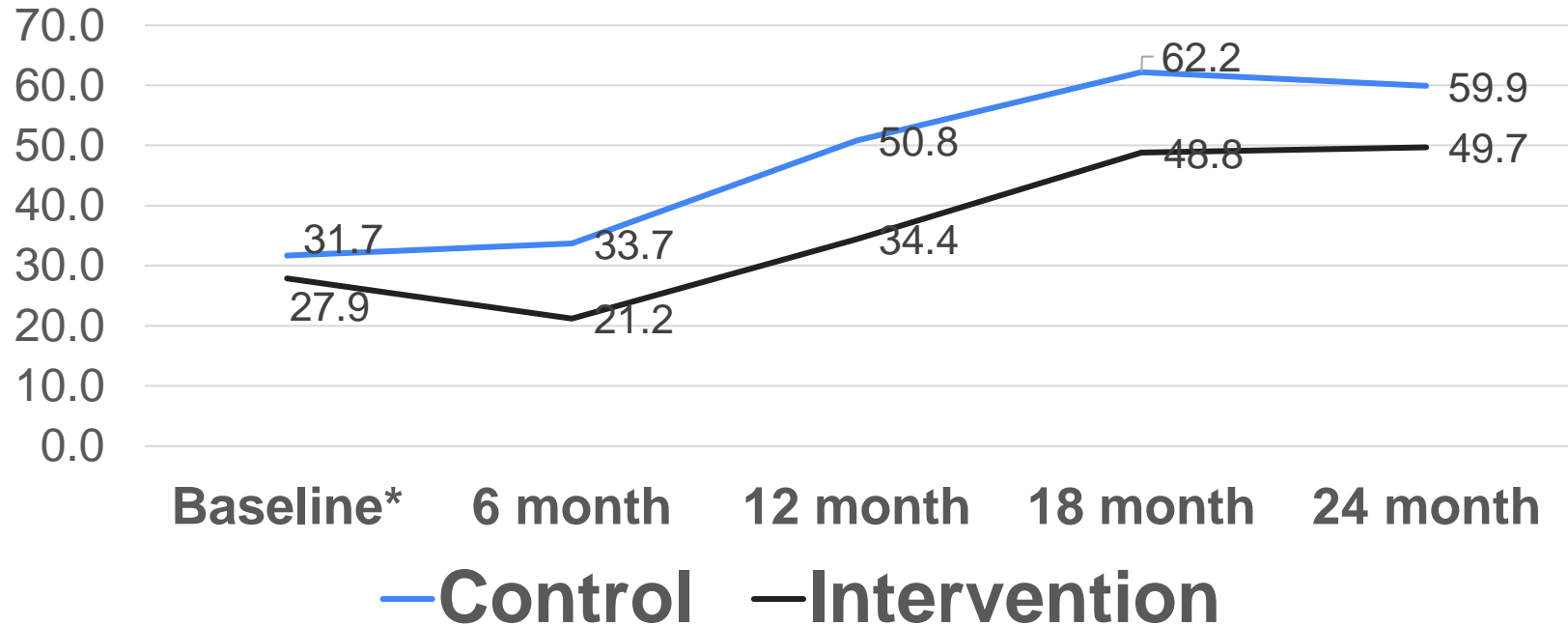
- The intervention delivery was administered by LHWs, with counseling sessions during supplements distribution, community sessions, and home visits every month on maternal nutrition during pregnancy, IYCF and messages on usage and benefits of supplements.



Key Findings



Prevalence Of Stunting Among Children At 0, 6, 12, 18 And 24 Months Of Age **



*Analysis is based on measurements for infants within 28 days of birth and accounted for clustering.

**The analysis is accounted for clustering using a linear regression model.

Conclusion

Provision of WSB+ and LNS-MQ during the first 1000-days of life improved child linear growth and reduced stunting in children at 24 months.

The risk of reduction in stunting (8.6%) and wasting among 6-23 months was statistically significant, along with the weight gain among pregnant women (5.8%), which shows that an immediate improvement in nutrition indicators is indeed possible.

Stunting Prevention project has proved the plausibility of achieving gains in short term with a combination strategy of nutrient based...

Effectiveness of cash transfers combined with lipid-based nutrient supplement and/or behavior change communication to prevent stunting among children in district Rahim Yar Khan, Pakistan

Primary Objective

- To assess that BISP cash transfers, specialized nutritious food (SNF) and/or social and behavioural change communication (SBCC) will result in a 20% reduction in the prevalence of stunting in children at the age of 24 months



Cash-based transfers

4,834 PKR, and then 5,000 PKR on a quarterly basis was provided by BISP Government of Pakistan

Secondary Objectives

- To assess reduction in the prevalence of wasting and underweight among children at 24 months of age
- To assess improvement in the micronutrient status and infant and young child feeding practices among children at 24 months of age
- To assess the cost-effectiveness of different intervention packages for the reduction in stunting among children at 24 months of age



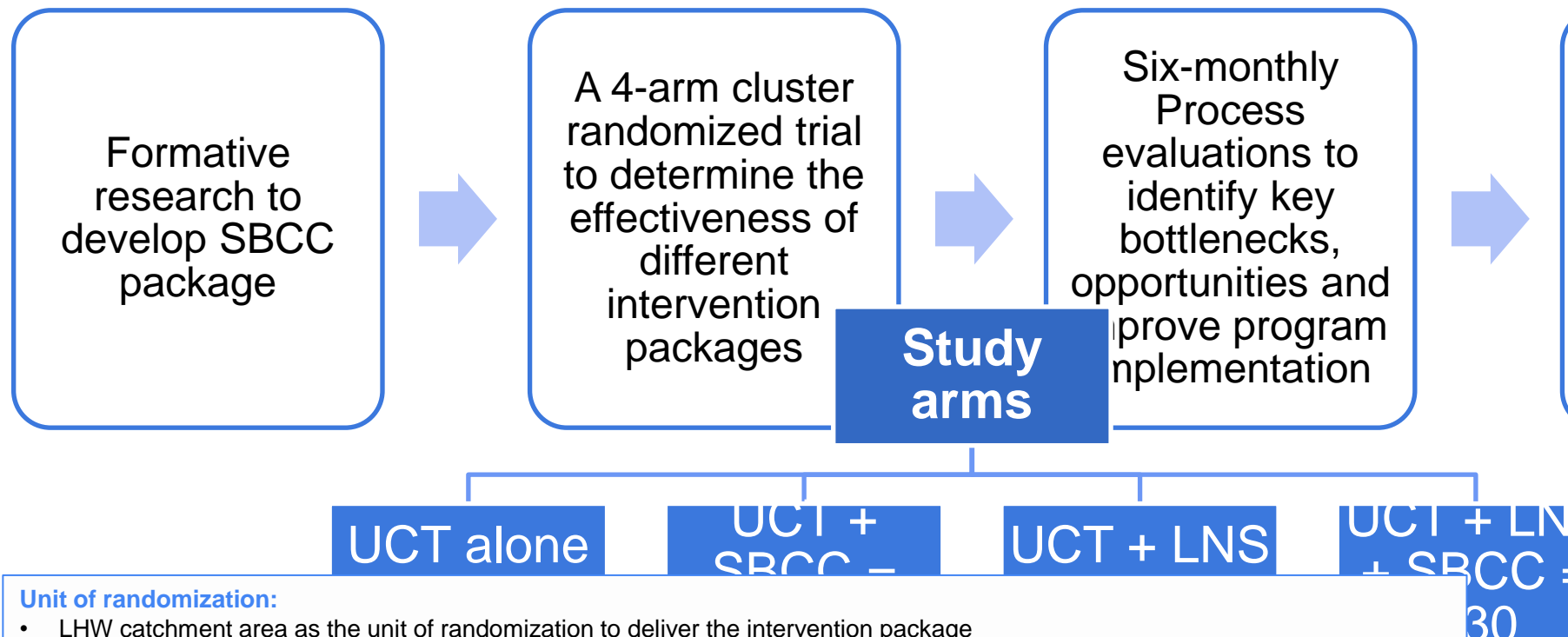
Lipid-based nutrient supplement (LNS) - Wawamum

Monthly ration of 30 sachets of 50g provided to each child for 18 months during 6-24 months of age



Social & behaviour change communication (SBCC)

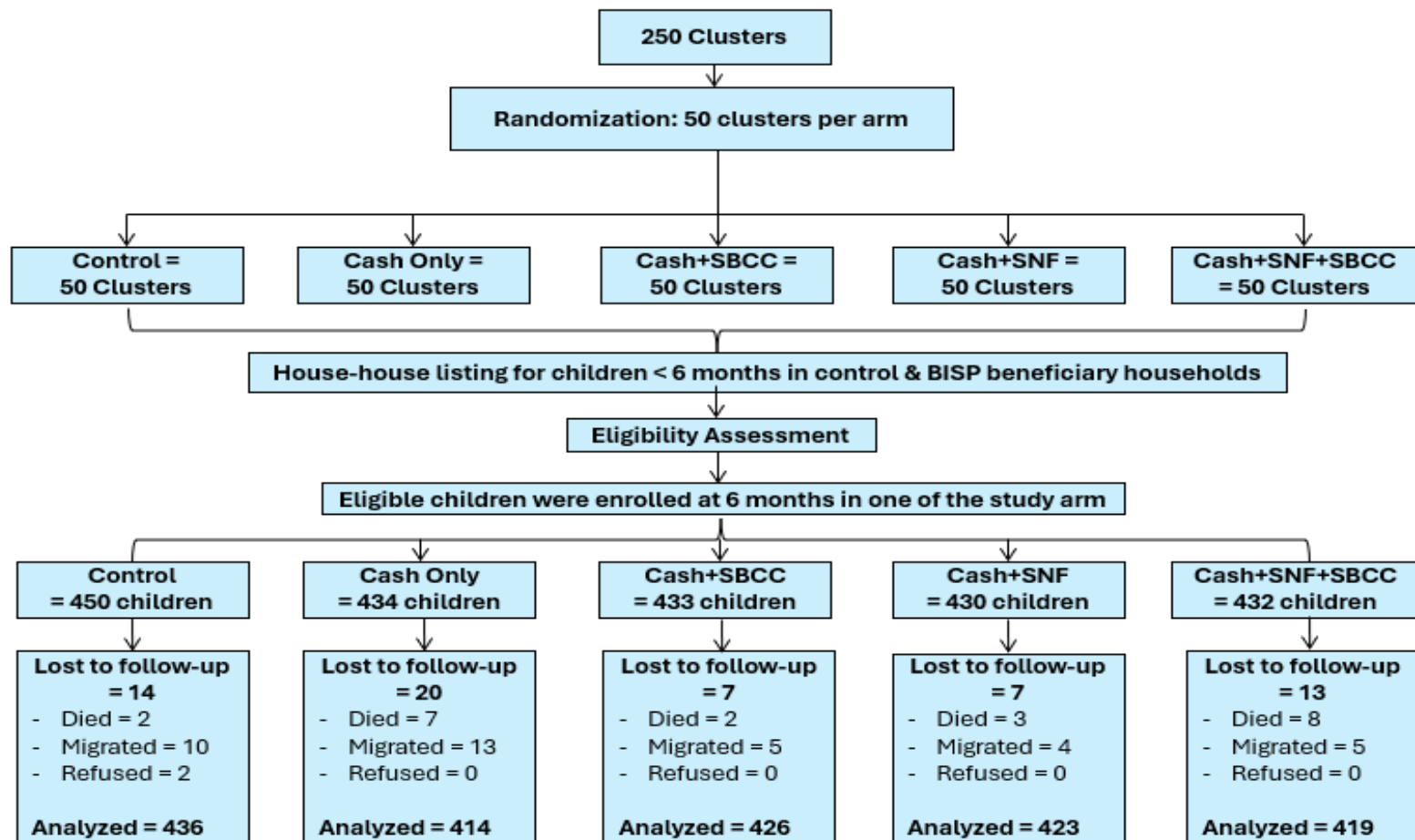
Methods



Unit of randomization:

- LHW catchment area as the unit of randomization to deliver the intervention package
- Of the 1600 LHW catchment areas or clusters identified, a total of 200 clusters were randomly selected and assigned into 1 of 4 study arms

Consort Flow Diagram of Study



Pooled and adjusted prevalence of stunting, wasting and underweight in children 6-24 months of age

Variables	Stunting ¹	Wasting ¹	Underweight ¹
	(95% CI)	(95% CI)	(95% CI)
UCT	41.7 (37.9, 45.4)	9.5 (7.6, 11.3)	21.9 (18.7, 25.2)
UCT + SBCC	44.8 (40.3, 49.3)	9.7 (7.8, 11.6)	22.1 (18.5, 25.8)
UCT + LNS	38.5 (34.3, 42.7)	8.4 (6.5, 10.3)	20.8 (17.3, 24.3)
UCT+LNS+SBCC	39.3 (35.1, 43.4)	8.6 (6.5, 10.7)	21.6 (17.8, 25.4)

Percentage compliance to LNS (day consumed/days observed *100):

UCT + LNS = 82.7 (\pm 11.2)

UCT + LNS + SBCC = 94.1 (\pm 11.3)

P value = <0.001

of LNS sachets shared with other family members:

UCT + LNS = 50.3 (\pm 34.5)

UCT + LNS + SBCC = 15.3 (\pm 34.6)

P value = <0.001

¹Accounting for cluster, gender and age

²P values were obtained from generalized linear model using a log link and binomial distribution

Conclusion

1

Use of UCT combined with LNS and SBCC were shown to be effective in reducing the prevalence of stunting in children at 24 months of age in low-and-middle-income setting

2

Scaling up of the UCT, in combination with LNS and SBCC sessions is recommended to improve the nutritional status of children living in marginalized populations

3

Cash with SNF and cash with SNF and SBCC are cost-effective interventions in reducing malnutrition in children at 24 months of age