LIFE LOW BIRTHWEIGHT INFANT FEEDING EXPLORATION STUDY

ARIADNE LABS

EXECUTIVE SUMMARY
Study Findings: A Two-Year Birth Cohort

NEW EVIDENCE AND CONTRIBUTIONS FROM THE LIFE STUDY

- **Despite being predominantly breastfed, the 1,100 moderately low birthweight infants in the LIFE study had suboptimal growth throughout infancy. Later growth outcomes were heavily influenced by birth outcomes, as well as growth in early infancy.**
- **Not all moderately low birthweight infants are alike. Specific characteristics make some low birthweight infants more vulnerable than others to illness, slow growth, and even death. These poor outcomes may be avoided with focused interventions at key timepoints.**
- **Growth monitoring soon after birth allows for early identification of risk and proactive intervention to prevent poor growth and developmental outcomes in later infancy.**
- **Growth and feeding assessment tools designed specifically for low birthweight infants in resource-limited settings are needed to facilitate targeted lactation support, clinical decision-making, and allocation of scarce resources.**

OVERVIEW OF LIFE STUDY

JUSTIFICATION: Low birthweight infants, particularly those born in low- and middle-income countries, are at increased risk for death, illness, feeding difficulties, growth deficits, and developmental delays.

METHODS: The LIFE study is a multi-site, mixed-methods, observational cohort study. Data collection was conducted for a one-year cohort in India Odisha State and Malawi and for a two-year cohort in India Karnataka State and Tanzania.

STUDY AIM: The goal of the LIFE study is to understand current feeding practices, growth patterns, child development, and other health outcomes among low birth weight (LBW) infants (1.50–2.49kg) in resource-limited settings through the first 24 months of life. Ultimately, the study aims to identify potential interventions and target groups, inform the research agenda, and enhance global guidelines.

IF A BABY:	THE RISK OF THE BABY **STUNTING AT 6 MOS** IS INCREASED BY	THE RISK OF THE BABY **BEING UNDERWEIGHT AT 6 MOS** IS INCREASED BY	THE RISK OF THE BABY **WASTING AT 6 MOS** IS INCREASED BY
IS BORN TOO EARLY AND TOO SMALL COMPARED TO BABIES BORN TOO EARLY BUT HEALTHY SIZE	**1.9 x**	**2.3 x**	**NO HIGHER RISK**
IS BORN ON TIME AND TOO SMALL COMPARED TO BABIES BORN TOO EARLY BUT HEALTHY SIZE	**2.3 x**	**2.9 x**	**2.0 x**
DOES NOT REGAIN ITS BIRTHWEIGHT IN THE FIRST 2 WEEKS COMPARED TO BABIES WHO REGAIN BIRTHWEIGHT IN 2 WEEKS	**1.5 x**	**1.6 x**	**NO HIGHER RISK**

Our study population included 151 (13.6%) infants born too early and too small; 327 (29.4%) born too early but normal size; 37 (3.3%) born too early but large; and 597 (53.7%) born on time but too small.

Improve Survival and Growth Outcomes

KEY ACTION 1: *Proactively identify and prioritize resources in early infancy to those at highest risk for mortality and poor growth outcomes.*

Improve Survival and Growth Outcomes—Twins, small-for-gestational age infants, and/or males were at highest risk for stunting, wasting, and/or underweight at 12 months, as were infants born to mothers with lower income, limited education, and/or multiple children. 40% of infants did not have a diverse diet at 12 months of age. At 24 months, gaps in diversity remained in India Karnataka and Tanzania. While acknowledging that all low birthweight infants require specialized care, clinicians can use the above-mentioned risk factors to identify infants who may need more frequent growth monitoring, increased breastmilk intake, and/or improved nutrient composition of milk. Infants with growth problems at 6 months (stunting, underweight and wasting respectively) had a significantly increased risk of the respective poor growth outcomes at 12 months (2.8 times for stunting, 4.9 times for wasting and 6.4 times for underweight) compared to those who did not experience poor growth at 6 months. Additionally, children with poor growth outcomes at 12 months had greater risk for similar outcomes at 24 months.

Improve Developmental Outcomes

KEY ACTION 2: *Evaluate the impact of early nutritional support on neurodevelopment among infants who have not regained their birthweight by two weeks.*

Improve Developmental Outcomes—Our research found that a lack of birthweight regain by two weeks and poor growth outcomes at 6 and 12 months signaled risk for developmental delays at one year. Assessment at these timepoints may allow for earlier intervention and promotion of nurturing care. Infants with a diverse diet in the second half of infancy had better developmental outcomes at one and two year, and caretakers should be counseled on the World Health Organization Infant and Young Child Feeding practices.

Refine Strategies for Risk Assessment and Intervention

Efforts are needed to refine tools for identification of at-risk infants and conduct research to develop optimal nutritional interventions.

KEY ACTION 3: *Develop a suite of standardized tools specific to low birthweight infants that clinicians, policymakers, and other stakeholders can implement to assess growth and breastfeeding quality.*

Guidance is lacking on the application and interpretation of existing child growth standards and breastfeeding assessment tools for low birthweight infants. Developing guidance and refining tools for specific application to this population will allow for more appropriate clinical decision-making and targeted lactation support, inform resource allocation, and enhance tracking of progress towards global targets.

KEY ACTION 4: *Assess the role of breastmilk volume and nutrient composition on growth among low birthweight infants.*

The study found no significant relationship between exclusive breastfeeding duration and growth at six and 12 months, pointing to the need for rigorous research to understand the characteristics of breastmilk and various forms of fortification and volume amplification.

Enhance Support for Infant Feeding

Beyond clinical interventions, educational and financial support for families are needed to ensure access to and provision of adequate nutrition for infants.

KEY ACTION 5: *Develop, evaluate, and scale programs that provide effective, specialized lactation support and feeding counseling to address the needs of low birthweight infants in facilities and communities.*

Develop, evaluate, and scale programs that provide effective, specialized lactation support and feeding counseling to address the needs of low birthweight infants in facilities and communities. The study found that while 44% of mother-infant pairs reported feeding difficulties, feeding counseling and support were neither universal nor consistent. Though early initiation of breastfeeding is known to have benefits for infant feeding and milk supply, only 37% of newborns in the study had initiated breastfeeding within one hour of birth, and even fewer among preterm infants. A great deal of global investment has been made in lactation support, however, low birthweight infants and their mothers face unique challenges in these areas. Curricula specific to their needs that promote frequency of feeding, milk expression to increase supply, transition to complementary foods, hygiene safety, kangaroo mother care, and monitoring for danger signs should be developed at the facility and community level and tested to understand their feasibility, acceptability, and impact on feeding and growth outcomes.

KEY ACTION 6: *Establish national programs to improve affordability of diverse foods to allow families to feed their low birthweight infants a balanced diet starting at 6 months.*

Mothers reported cost as the main barrier to feeding infants certain nutritious foods, and infants born to mothers in households with lower incomes were less likely to achieve optimum dietary outcomes at 12 and 24 months.

NEXT STEPS

Based on the findings from LIFE, the LIFE consortium is expanding to embark on implementation science research to design and test a lactation support and management package for in-facility, high risk infants and as they transition home; and explore interventional research to improve feeding of vulnerable infants in the facility setting.

FOR MORE INFORMATION

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Study Partners

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- **Srirama Chandra Bhanja (SCB) Medical College and Hospital,** Cuttack, India
- **JJM Medical College,** Davangere, India
- **SS Institute of Medical Sciences,** Davangere, India
- **University of North Carolina-Project Malawi,** Lilongwe, Malawi
- **Muhimbili University of Health and Allied Sciences (MUHAS)** Dar es Salaam, Tanzania
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