

## The USAID ENGINE Birth Cohort Study

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### What is the study rationale?

The new Accelerated Stunting Reduction Initiative highlights early action to address stunting in Ethiopia. Stunting begins early in life, even before birth. Thus strategies to address stunting ideally focus on pregnancy and gestation through 2 years of age. Recent data analysis for ENGINE using the Ethiopian DHS data from 2000, 2005 and 2011 strongly suggests a combination of socio-economic status; water, hygiene and sanitation; and maternal indicators are most predictive of stunting for infants and young children under 24 months of age.<sup>1</sup> Poor diets, malaria, and anemia are also significant contributors to maternal and child morbidity in Ethiopia. In Ethiopia, childhood stunting unfolds over the first 24 months of life as a variety of biological, social, and environmental factors become relevant.<sup>1</sup>

The Ethiopian Agricultural Growth Program (AGP) and USAID ENGINE are being implemented to improve livelihoods, to augment income through agriculture, and enhance maternal and infant and young child health and nutrition (MIYCN) through social and behavior change communication. This birth cohort study investigates the benefits of co-locating an integrated nutrition program (USAID ENGINE) with the AGP. It also examines the effectiveness of ENGINE, an integrated program, on uptake, adherence, exposure, coverage and consistency of intervention delivery. The study will collect longitudinal data on household agricultural production and productivity, food security, diet diversity, socio-economic status and livelihoods, and health status, anthropometry and hemoglobin for mother and index child. A prospective observational birth cohort study is a “gold standard” method to rigorously understand how and why specific strategies and approaches address nutrition and health concerns of vulnerable groups.

### What are the aims of the study?

1. To understand the effect of direct and nutrition specific interventions on maternal and infant nutrition and health outcomes, as well as those related to WASH. Specific outcomes of interest include anemia in both targets groups, birth outcomes, linear growth velocity in infants and stunting at 2 years of age.
2. To understand the effect of co-locating a direct nutrition specific and nutrition sensitive agriculture program with a small holder commercialization program aimed in improving livelihoods on the nutrition of mothers and their infants (followed from birth to 2 years of age).
3. To examine the uptake and adherence by the household of nutrition and health messages delivered/received through activities supported by USAID ENGINE.
4. To examine the exposure, coverage, and consistency of the activities supported/implemented by USAID ENGINE.
5. To examine the difference in effects on maternal and infant nutrition and health outcomes due to variability of coverage, exposure and uptake of activities supported/implemented by USAID ENGINE (e.g. social and behavior change communications (SBCC), support to vulnerable households, nutrition messaging and training).

### What is the study design?

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<sup>1</sup> See: (1) Ghosh S, Suri D, Hiko D, Fentahun N, Griffiths JK. Factors associated with stunting in Ethiopian children under five. Report to ENGINE and USAID/Ethiopia April 2014. (2) Spears D. How much international variation in child height can sanitation explain. The World Bank Policy Research Working Paper Series [Internet]. 2013 April 22, 2014:[55 p.].

This study has two components. The first component is a household observational birth cohort study in three Oromia woredas (two woredas with both USAID ENGINE and AGP interventions and one woreda with neither). The second component involves annual institutional interviews of health service delivery workers including Health Extension Workers (HEW) and Health Workers (HW) as well as agricultural extension/education agents called Development Agents (DA) in these 3 woredas. Data from the birth cohort study allows the interventions to be tested against the outcome measures while the institutional component will allow us to understand the coverage and consistency of the interventions.

### **What are the study activities?**

#### ***Site Selection***

The Oromia region was selected as it has most of the USAID ENGINE implementation woredas and also has high stunting rates. Three woredas were selected: one woreda from ENGINE year 1 rollout, one from ENGINE year 2, and one with no ENGINE or AGP exposure. Woliso, Goma, and Tiro Afeta were (respectively) chosen. They were selected based upon having a population of more than 3000 pregnant women; agro-ecological and geographical similarities; and proximity and accessibility to major roads and cities.

#### ***Sample Size***

The total study enrollment is 4680 pregnant women. 1560 pregnant women will be recruited in each woreda (representing Year 1 rollout, Year 2 rollout, and counterfactual). Anticipating a 30% loss and attrition from pregnancy through birth of the infant, we expect 1200 live births per group, or 3,600 women-child pairs in all. Yearly interviews will also be conducted in these woredas with 887 institutional workers such as Health Officers, Health Extension Workers, Health Extension Army volunteers and Development Agents.

#### ***Subject Characteristics***

Pregnant women, ages 18-49 are being recruited between 12<sup>th</sup> - 32<sup>nd</sup> weeks of pregnancy. Recruited women are followed through delivery, and then the mother-infant dyad is followed until 2 years of age.

#### ***Data Collection***

Households are visited every 3 months (maximum of 9 visits) based on an enrollment schedule. Information being collected include antenatal care; pregnancy outcomes such as birth weight; maternal and child nutrition over time (anthropometry); breast feeding and food consumption; diet diversity; food security; livelihoods, agricultural productivity and market participation; household socioeconomic status; education; water/sanitation/hygiene; and hemoglobin and malaria testing. Yearly institutional interviews collect information on health and agricultural extension services provided, training and support received, and assessment of challenges related to providing services in each woreda.

### **What are the Activities to date?**

Field work began in November 2013 with extensive pretesting and finalization of survey tools, and the hiring of six data collection supervisors and 35 data collectors (24 Health & 9 Agriculture). All hires have been local. This has proven extremely beneficial to gain community entry and access through the sensitization period. A twelve day training workshop was held at Jimma University in December 2013. Attendees included the 41 field staff along with 8 Ethiopian PHD candidates, the local principal investigators and Tufts/ENGINE staff. After training, the data collection teams were sent to the study woredas to begin community sensitization including woreda and kebele officials on the study aims and objectives. Orientation meetings were held with all HEWs and their supervisors to explain the study and gain their support to identify pregnant women in their kebeles. The field staff, with guides and HEWs, then conducted a pregnancy surveillance, which identified 3000 pregnant women in the three woredas. They also assessed transportation options and other logistics for study implementation. Data collection was planned to start in early January, but required government approvals

and motorbikes moved the start date to early March. This time was used by the enumerators to improve their skills and to integrate themselves into their communities. The team also held a short refresher-training course in each woreda. Data collection began in Gomma woreda on March 7, in Tiro Afeta on March 10 and in Woliso on March 13. As of April 18, ~ **750** pregnant women have been recruited, and **30** infants had been born. All data are collected on handheld electronic tablets and are uploaded to a secure server weekly where it is cleaned and monitored by a local data manager.

**What are the challenges to date?**

Tiro Afeta woreda has very little mobile network available for phone calls, and no available Internet connection. Power often either is unavailable or unstable. These challenges have been addressed by the purchase of a gas generator and power stabilizers for the Tiro Afeta field team. Alternative methods for transferring data via SD memory cards have been developed and are working successfully. The pace of recruitment will need to increase so we can achieve our enrollment goal of 4680 pregnant women. Data collectors have found they must go house to house to reach the pregnant women, which decreases the number of interviews they can complete per day. This challenge has been addressed by having the enumerators visit women individually, rather than in team of two, to increase our coverage.