Food security is associated with infant development and child mortality in the Amhara Region of Ethiopia

Husein Mohammed
PhD candidate in human nutrition
School of Dietetics and Human Nutrition
McGill University

Introduction

- Ethiopia is the second most populous country in Sub-Saharan Africa (95 million)
- Smallholder agriculture for home consumption, relying on traditional technologies and erratic rainfall
- 40% of the population undernourished[1]
- Most vulnerable groups
  - Pregnant women
  - Infants and young children

[1]Undernourished: consumption below minimum energy requirement for health and light physical activity

Joachim and Tolulope, 2007; Food security portal, 2014

Maternal and child nutrition and health status

- Pregnant women
  - Anaemia (42%)
  - Vitamin A deficiency (38%)

- Children
  - Anaemia (44%)
  - Stunting (44%)
  - Morbidity
    - Fever (7%)
    - Acute respiratory tract infection (17%)
    - Diarrhoea (13%)
  - Under-five mortality declined by 67%
    - 204 to 68 per 1000 live births (1990-2012)

Desalegn, 1993; EDHS, 2011; Gebreselassie et al., 2013; UNICEF, 2012; UN, 2013

Objective

To assess the association between household food security and

- maternal vitamin A status (night blindness) and birth outcomes (stillbirths and miscarriages)
- infant growth (stunting, wasting and underweight)
- child mortality (<5 y)

Methods

- This analysis is part of a broader randomized clinical trial, evaluating the effect of iodized salt consumption on child development in Amhara region of Ethiopia

- Selection
  - 1 village per district
  - 44 districts in 5 zones
  - 1027 pregnant women

- Selected women had lived in the study area for at least one year and intended to stay there for another year

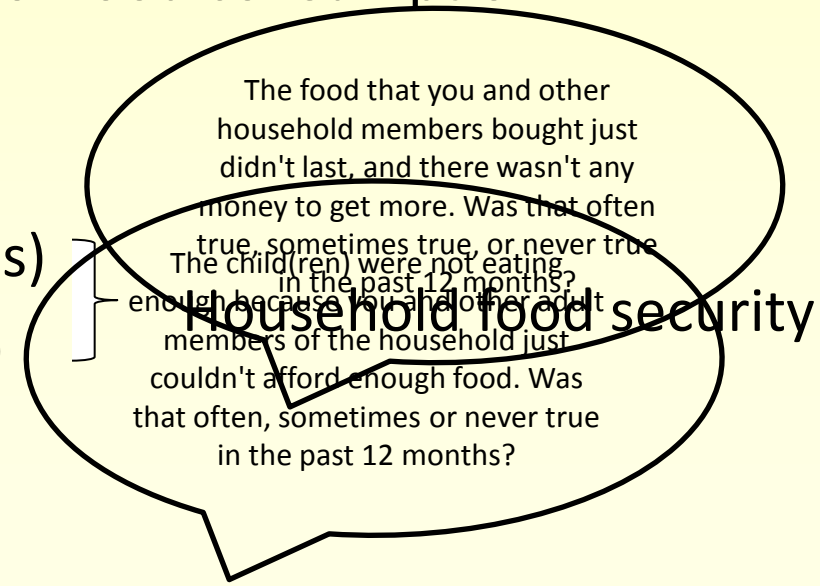
- They were followed until their babies were between 5-13 mo

- Ethical approval obtained from the EPHI, ENRERC, and McGill University

- Data collected
  - Household food security
  - Socio-demographic characteristics
  - Maternal obstetric history
  - Past experience of child (<5 y) death
  - Maternal dietary diversity
  - Infant morbidity (diarrhea, fever, cough, and/or malaria in past 14 d)
  - Infant anthropometry

Food Security (HFSSM)

- Focuses on self-reports of uncertain, insufficient or inadequate food
- Access, availability, and utilization due to limited financial resources
- Compromised dietary patterns or food consumption
- Includes 18 questions
  - Adult food security (10 items)
  - Child food security (8 items)



Results

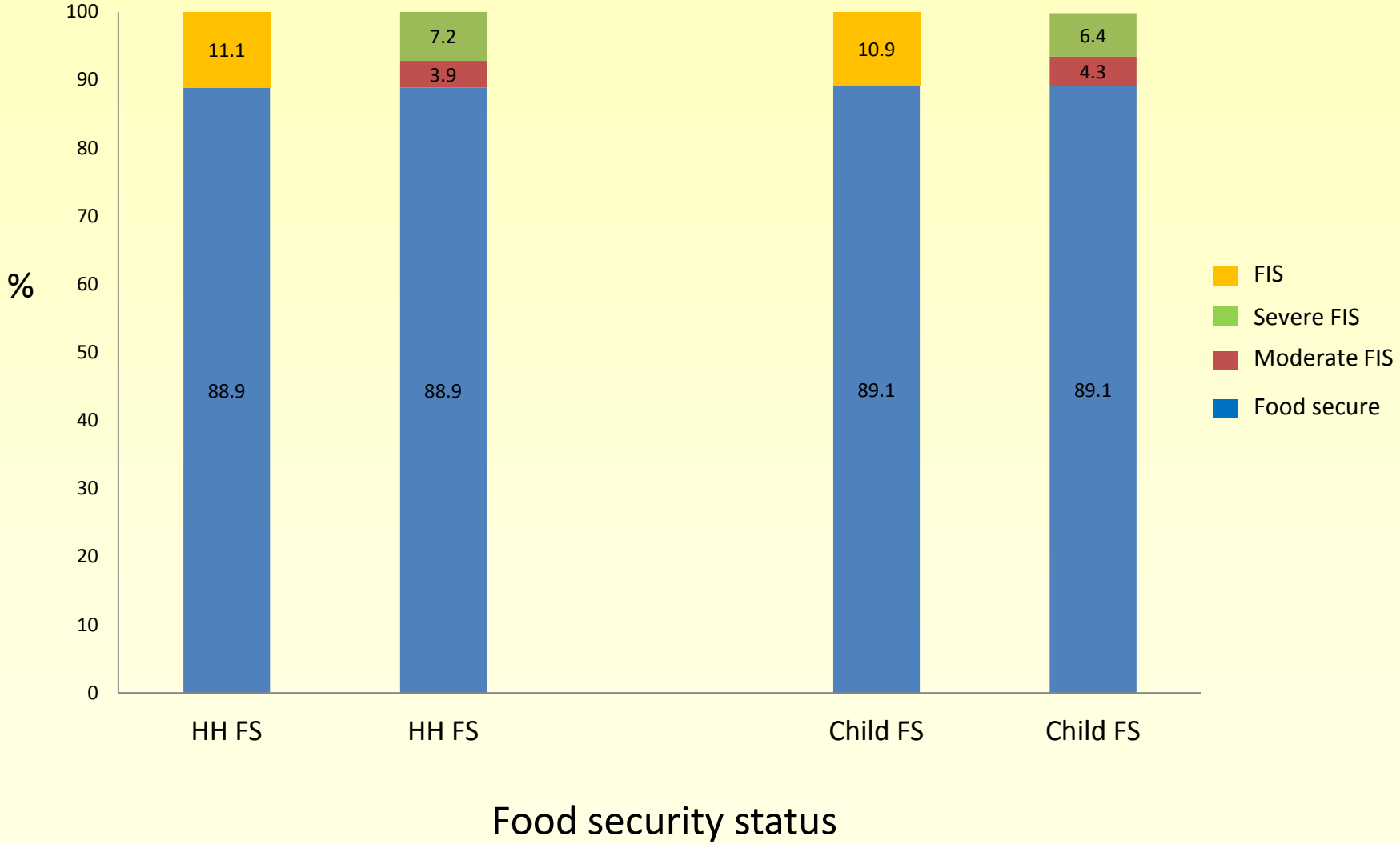
Table 1: Socio-demographic characteristics of households

Indicator	Categories	Frequency (%)
Agriculture land	Yes	945 (91.7)
Livestock	Yes	961 (93.6)
Assets	<4 out of 10	821 (79.9)
Water and sanitation	<2 out of 3	622 (60.6)
Maternal education	None	755 (75.4)
	Some formal	246 (24.6)
Maternal activity	Farming	977 (95.2)
	Other	48 (4.8)
Maternal dietary diversity	< 5 out of 7	606 (59.4)
Child sex	Male	518 (53.1)
	Female	458 (46.9)

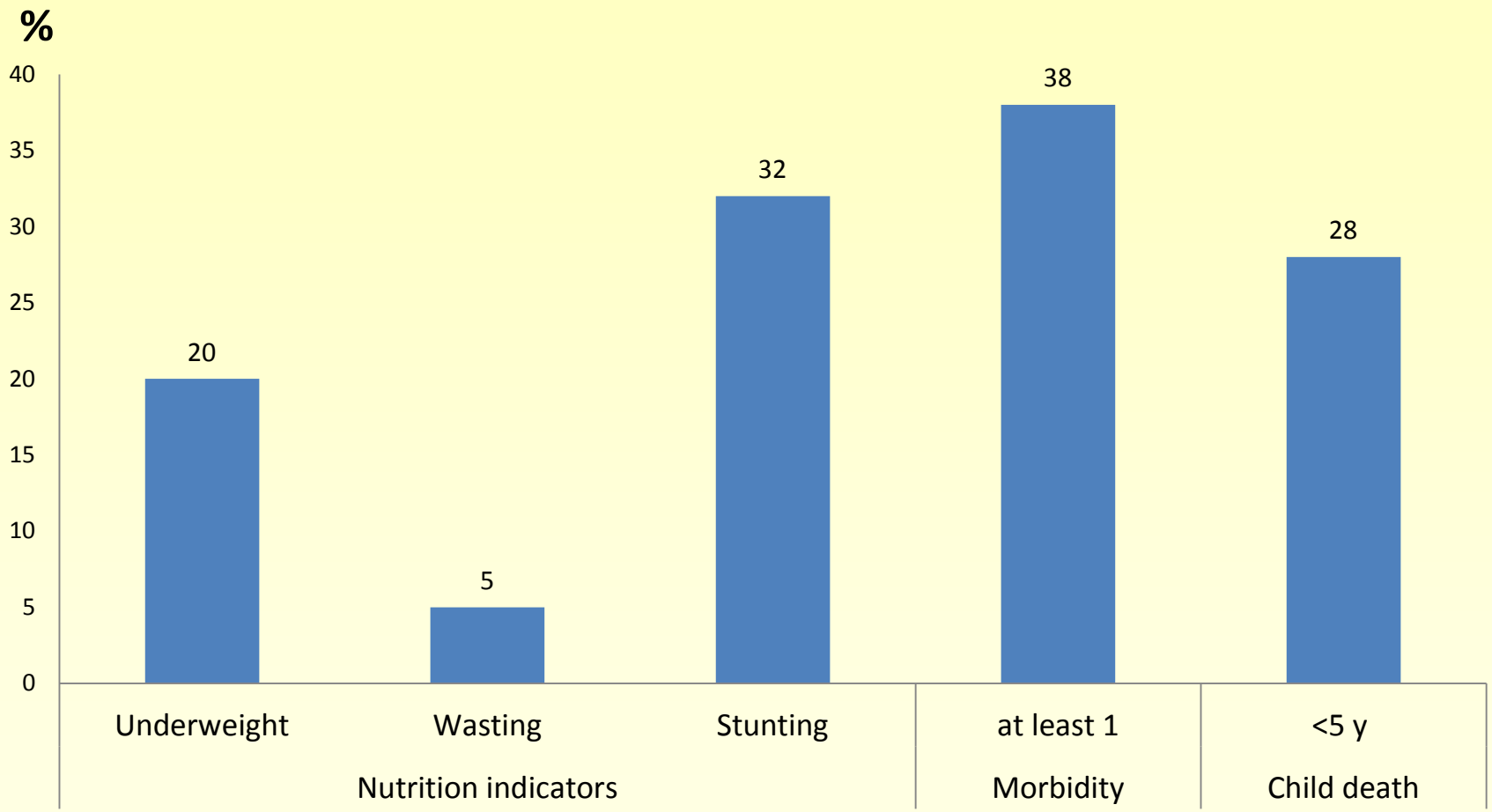
Maternal pregnancies and outcomes

Indicator	Categories	Frequency (%)
Pregnancies	<4	604 (58.8)
Night blindness	Yes	334 (32.9)
Anemia	Yes	686 (66.9)
Pregnancy outcomes	Miscarriage	137 (13.4)
	Stillbirths	67 (6.5)

Prevalence of food security

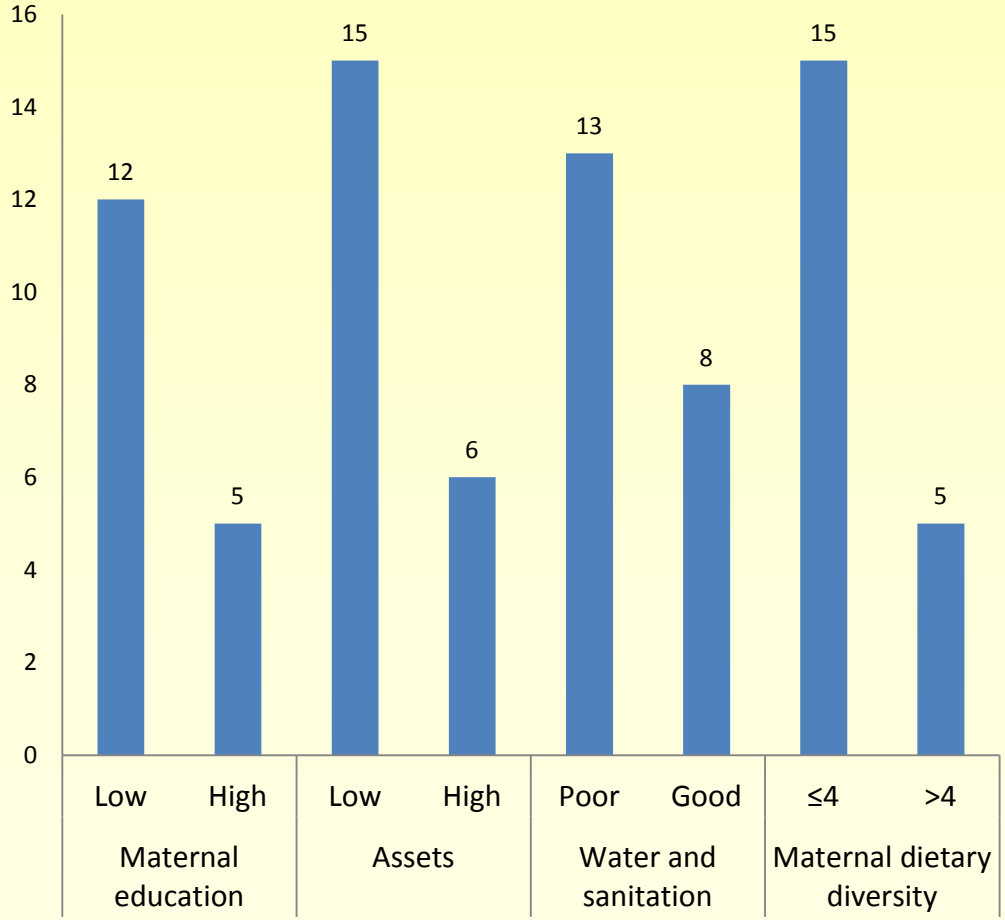


Prevalence of infant and child outcomes (%)



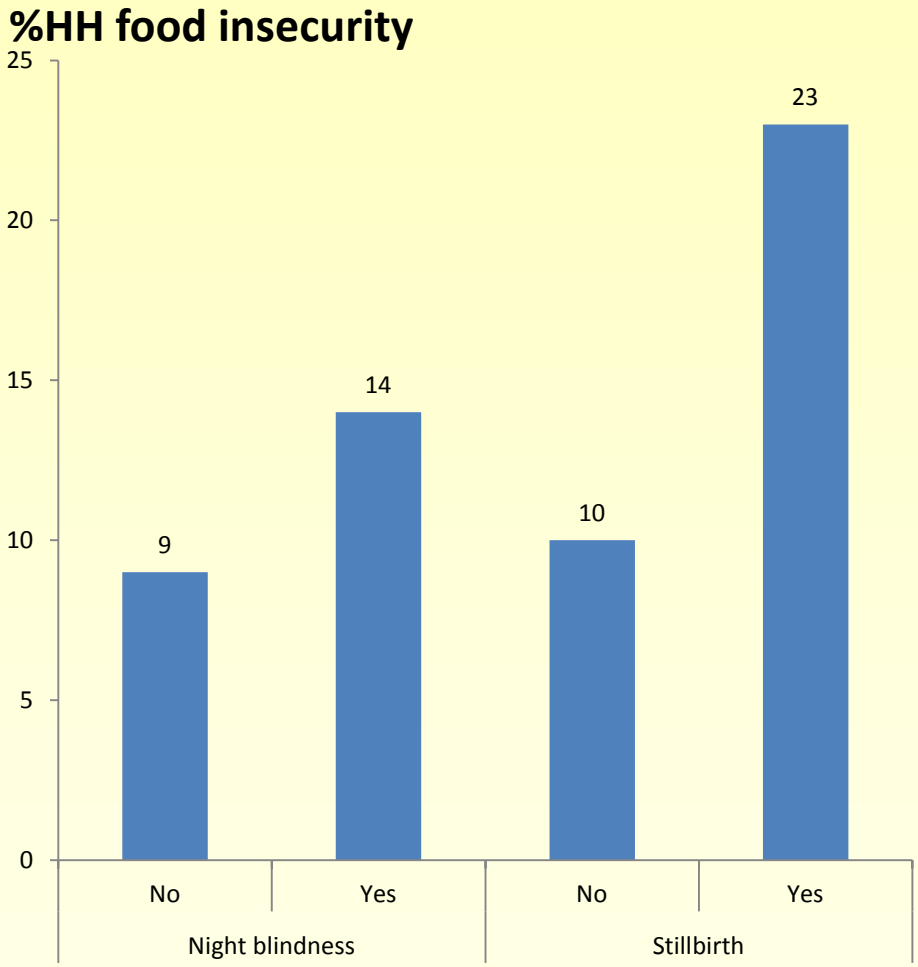
Food insecurity and household characteristics

% HH food insecurity



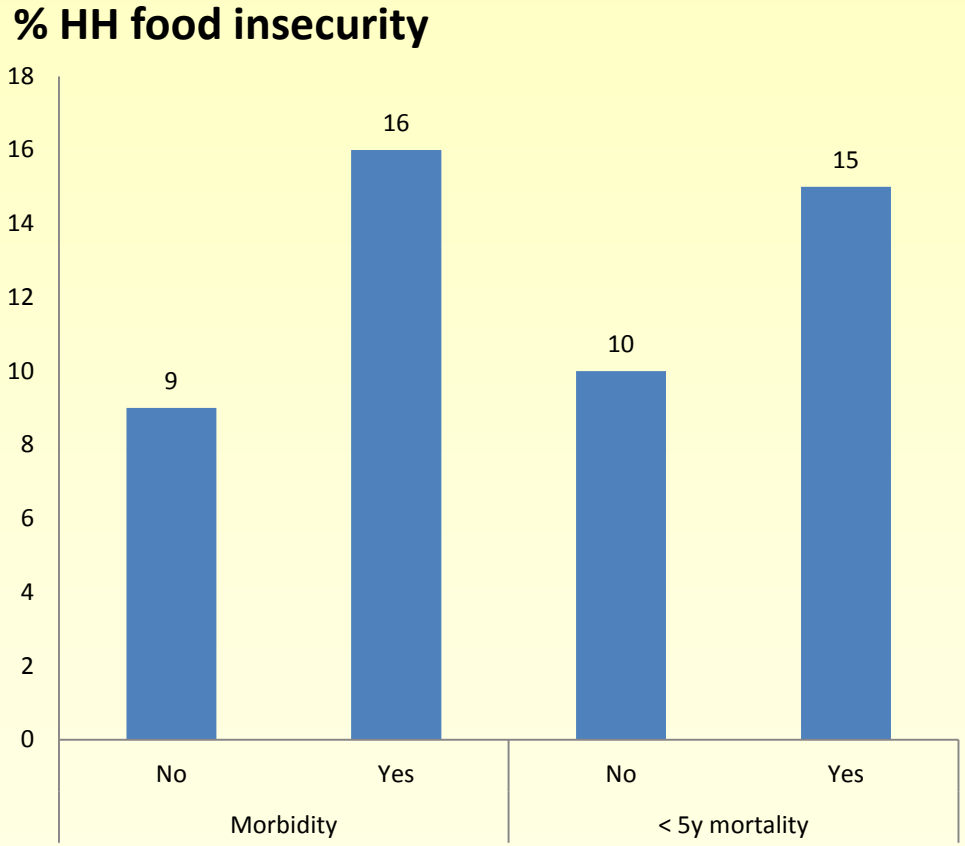
Variable	OR (95% CI)
Maternal education	0.39 (0.21,0.71)
Assets	0.37 (0.23,0.59)
Water and sanitation	0.64 (0.42,0.97)
Maternal dietary diversity	0.28 (0.17,0.47)

Food insecurity and pregnancy outcomes



Variable	OR (95% CI)
Night blindness	1.66 (1.11,2.47)
Stillbirths	2.61 (1.41,4.82)

Food insecurity and infant and child outcomes



Variable	OR (95% CI)
Morbidity	2.01 (1.34,3.02)
Under 5 y mortality	1.71 (1.34,3.02)

Predictors of maternal diet

Response variable	Predictors	OR (95% CI)
Maternal dietary diversity	Household food insecurity	0.31 (0.21,0.46)
	Maternal education	1.50 (1.13,1.99)
	Assets	2.27 (1.78,2.89)

Model controlled for the effect of districts

Predictors of infant adverse outcome

Response variable	Predictors	OR (95% CI)
Morbidity	Household food insecurity	2.05 (1.35,3.11)
	Underweight	1.80 (1.30,2.50)
Under 5 y child death	Household food insecurity	1.82 (1.13,2.94)
	Maternal age	3.11 (2.13,4.55)
	Number of births	1.52 (1.04,2.22)
Wasting	Adult food insecurity	2.31 (1.08,4.99)
	Maternal education	0.48 (0.18,1.04)

Predictors of maternal outcomes

Response variable	Predictors	OR(95% Cl)
Stillbirths	Household food insecurity	2.40 (1.26,4.56)
	Maternal age	2.22 (1.31,3.79)
	Water and sanitation	0.47 (0.25,0.86)
Night blindness	Household food insecurity	1.62 (1.09,2.42)
	Number of births	1.52 (1.16,1.98)

Conclusion

- Food insecurity in our study area was lower than expected (11%)
  - Season

- Food insecurity was an important risk factor
  - Nutritional status during pregnancy
  - Adverse pregnancy outcome
  - Poor child growth
  - Mortality before 5 y

- Further studies need to be conducted in the study area, in different seasons, and using different tools to understand the importance of food security in these vulnerable groups.

Thank you

Acknowledgement:

- Dr Grace Marquis
- Dr Frances Aboud
- Karim Bougma
- Aregash Samuel
- Valerie Friesen
- Kimberly B Harding

Funded by Micronutrient Initiative