Title: Seasonal Changes in the Prevalence of Food Insecurity among Rural Households in East Ethiopia: A Longitudinal Panel Study

Conference place:

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Introduction

• Food insecurity is a situation that exists when all people, at all times, lack:
  — physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (De Muro P, Mazziotta M. (2010/2011)

• Food insecurity has become a major public health problem affecting 5% to 25% of the general population in both developing and developed settings worldwide (Arene CJ, Anyaeji RC, 2010)
• An estimated 870 million or one in every eight people is chronically undernourished worldwide (FAO, WFP, et al. 2012)
Introduction . . . .

- In Ethiopia, scientific reports showed that **household food insecurity** is still a critical concern following a memorable occurrence of famines in the country

( OSSREA 2002; Vadala 2009; Regassa and Stoecker 2011; Belay 2012)
Introduction

• Some factors associated with household food insecurity in Ethiopia regardless of seasonal variation:
  — Socio-demographic characteristics of the head of the household
  — Household’s socio-economic position and farm size
  — Insufficient food grains production

(Omotesho, Adewumi et al. 2006; McBriarty 2011; Bashir, Schilizzi et al. 2012; Gezimu Gebre 2012)

• However, sufficient evidence is lacking on the seasonal variation in the prevalence of household food insecurity and its determinants in Ethiopia.
Objectives

• **General**
  – To assess the level of household food insecurity and its correlates in wet and dry seasons among rural residents of east Ethiopia from **August, 2011 to February, 2012**

• **Specific**
  – To determine the level of household food insecurity among rural residents
  – To identify factors associated with household food insecurity among rural residents
Methodology

• **Study setting**
  
  — Kersa Demographic Surveillance and Health Research Centre (KDS-HRC) of Haramaya University, eastern Harage zone of Oromia region
  
  — KDS-HRC was established in **2007** and is one of the Demographic Surveillance Sites (DSS) in the country comprising **10,256 households** with a total adult population of **48,192** during survey
  
  — KDS-HRC has **three agro-climatic zones**: low land, high land, and midland
Figure : Map of the study area
Study design and sample size

• A longitudinal panel study was conducted among randomly selected rural mothers.

• Sample size formula for cohort study was used to achieve adequate power with the following assumptions:
Assumptions (sample size)

- two sided alpha = 0.05, \( \beta = 0.1 \),
- proportion of food insecurity among exposed (uneducated mothers in rural households) to be 0.28 \[\text{Regassa N, Stoecker BJ.}\]
- proportion of food insecurity among control group (educated mothers in rural households) to be 0.20, and
- estimated loss to follow-up to be 20%,
- yielding a total of 1,436 study samples.

However, all mothers \((2132)\) who had completed their follow-up were considered for this study to increase the power of the study.
Sampling procedures

• Simple random sampling was used to select households from the sampling frame of the KDS-HRC proportional to the estimated population size of each kebele.

• Mothers were then drawn from the randomly selected households in each study kebele/village proportional to the maximum sample size allocated.

• If more than one mother lived in the selected household, one mother was selected by lottery method.

• The same mother was interviewed twice (at the base-line and end-line of the study) to obtain important information on the households food security status.
Sampling procedures . . . .

10 Rural Kebeles

2 Semi-urban Kebeles

Simple Random sampling, proportionate to population size

2098 households (HH)

254 households (HH)

Simple Random sampling

1 mother–child pair selected per HH (if more than one child per HH lottery method was used)

1 mother–child pair selected per HH (if more than one child per HH lottery method was used)
Data collection

• Data were collected at the base-line during the peak level of the wet season in August, 2011 and in February, 2012 in the dry season at the end-line of the study.

• A structured and pretested questionnaire was used to collect household’s background information from the mothers.

• Household Food Insecurity Access Scale (HFIAS) questions were used to determine the level of household food insecurity.
Data collection

• Questions were initially prepared in English and translated into local language ("Afaan Oromo")

• Data collectors with at least high school level of education were recruited from the nearby community.

• Diploma nurses and other relevant professionals having equivalent training in the related fields were used as supervisors.
Study variables

• **Dependent variable:**
  - household food security status

• **Independent variables:**
  - maternal education, paternal education and occupation,
  - household’s socio-economic position,
  - season of data collection,
  - food source of the household, and
  - frequency of cultivation
Data processing and analysis

• Data were double entered onto EPI- Data Version 3.1 and were exported to STATA version 11 for further analysis

• **Hausman’s test** was used to choose between conditional fixed-effects and random-effects logistic regression model for panel data analysis

• Variability within individual study participant with respect to **time variant explanatory variables** was compared using conditional fixed-effects logistic regression model
Data processing & analysis

- Bivariate analyses were conducted to check the association between dependent variable and explanatory variables.
- All variables with \( p \) value of \( \leq 0.25 \) were considered in the multivariable conditional fixed-effects logistic regression analysis.
- Odds ratio along with 95% confidence intervals was estimated and \( p \) values were determined.
Data quality control

• Training of data collectors and supervisors
• Pretest of the questionnaire
• Supervision of data collection process
• Cross – checking of the questionnaire for its completeness on daily basis
Ethical clearance

- Ethical Review Committee of Haramaya University, College of Health and Medical Sciences
- Informed verbal and written consent was obtained from each respondent before the interview
- Illiterate mothers consented by their thumb print after verbal consent
Result and Discussion

• Out of the initial **2,352 mothers** that were recruited, only **2,234** fully participated in the surveys.

• **102 mothers** were excluded from the analysis due to incomplete data.

• Further analysis was conducted on **2,132 mothers**, making a response rate of **95.4%**.
Results and discussion

Table 1: Time variant characteristics of study participants by season of data collection, Kersa district, east rural Ethiopia, 2012.

<table>
<thead>
<tr>
<th>Characteristics of study subjects</th>
<th>Wet season</th>
<th>Dry season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Food security status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food secure</td>
<td>1182</td>
<td>55.4</td>
</tr>
<tr>
<td>Food insecure</td>
<td>950</td>
<td>44.6</td>
</tr>
<tr>
<td>Household assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1145</td>
<td>53.71</td>
</tr>
<tr>
<td>No</td>
<td>987</td>
<td>46.29</td>
</tr>
<tr>
<td>Owns oxen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>124</td>
<td>5.82</td>
</tr>
<tr>
<td>No</td>
<td>2008</td>
<td>94.18</td>
</tr>
<tr>
<td>Average HFIAS</td>
<td>Mean (±SD)</td>
<td>18.16(0.91)</td>
</tr>
<tr>
<td>Mother’s weight (Kg)</td>
<td>Mean (±SD)</td>
<td>50.1(6.35)</td>
</tr>
</tbody>
</table>

HFIAS= Household Food Insecurity Access Scale
Table 2: Predictors of household food insecurity among rural residents, Kersa district, east Ethiopia, 2012.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>COR(95%CI)</th>
<th>AOR(95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s education</td>
<td>Literate</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Illiterate</td>
<td>2.8(2.4, 3.2)**</td>
<td>1.1(0.8, 1.5)</td>
</tr>
<tr>
<td>Paternal education</td>
<td>Literate</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Illiterate</td>
<td>1.9(1.6, 2.3)*</td>
<td>1.2 (0.9, 1.5)</td>
</tr>
<tr>
<td>Paternal occupation</td>
<td>Farmers</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Others £</td>
<td>1.7 (1.2, 2.3)**</td>
<td>2.9 (1.8, 4.6) **</td>
</tr>
<tr>
<td>Socio-economic position</td>
<td>Poor</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>0.5(0.4, 0.7)*</td>
<td>0.5(0.4, 0.7)*</td>
</tr>
<tr>
<td></td>
<td>Rich</td>
<td>0.4(0.3, 0.5)*</td>
<td>0.3(0.2, 0.4) *</td>
</tr>
<tr>
<td>Season</td>
<td>Wet</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Dry</td>
<td>0.37(0.32, 0.42) **</td>
<td>0.38(0.29, 0.52) **</td>
</tr>
<tr>
<td>Food source of household</td>
<td>Others ϩ</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Own production</td>
<td>0.44(0.37, 0.52)**</td>
<td>0.89(0.70, 1.1)</td>
</tr>
<tr>
<td>Frequency of cultivation</td>
<td>≥ 2 times per year</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&lt; 2 times per year</td>
<td>1.2 (0.9, 1.4)</td>
<td>1.2(0.9, 1.5)</td>
</tr>
</tbody>
</table>

LR chi2 = 333.17, Prob > chi2 = 0.00001, Log likelihood = -543.89331

* = p < 0.05 , ** = p < 0.001 , COR= Crude Odds Ratio , AOR= Adjusted Odds Ratio , £ = daily labourer, students, etc, ϩ = market, food aid, etc
Conclusion and Recommendation

- Household food insecurity was more common in the wet season. Basic household factors such as paternal occupation and household’s socio-economic positions were identified as important predictors.

- Season-oriented food security interventions such as food subsidy and transfer system, income generating schemes like micro-credit and food for work programs should be designed to enable poor rural households to have access to adequate food in Ethiopia.
Acknowledgement

• Haramaya University
• Kersa woreda administrators
• Data enumerators and supervisors
• Study participants
• Others relevant bodies
Thank You !