Supplemental Table 1: Characteristics and main findings of studies

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| Reference | Region | Survey | Population | Food security measures & criterion  | Food collection method | Study Methods | Key findings |
| Adebayo et al, 2016  | Nigeria | Nigeria Living Standard Survey (NLSS), 2010 | 17,959 HHs in Northern Nigeria | *Percentage of expenditure on food* HH is considered food secure when per capita food expenditure > weighted 2/3rds of mean per capita expenditure, i.e. the food poverty line. Three categories of food poverty used: core food poor, moderately food poor and food non poor. | Diary of daily food consumption and expenditure, own produced and purchased food items by HH. Food expenditure categorised into 6 groups. | Data analysed using an Ordered Probit Regression Model, where the Regression model was adjusted for 21 explanatory variables. Consumer Demand and Production theories provided basis of theoretical framework where HH food security modelled on HH utility model (Singh et al, 1986)  | 84.9% of HHs surveyed were considered food poor. Male headed HHs positively related to food poverty. Food price index reported to have a positive relationship with food poverty. Other HH variables assessed including age of head of HH and composition of the HH.  |
| Cuong, 2011 | Vietnam | Vietnam HH Living Standard Survey (VHLSS), 2002, 2004 & 2006 | 29,533 HHs (2002)9,188 HHs (2004)9,189 HHs (2006)Surveys representative of national, rural, urban and regional areas | *Food basket or similar*HH is considered food poor if per capita expenditure < food poverty line of 2,100kcal/day. Calorie requirements as per GSO and World Bank, no date provided. | Food expenditure includes purchased food and self-produced products of HHs, no other detail provided.  | Poverty indices used: poverty incidence, poverty gap index and poverty severity index, based on the Foster–Greer–Thorbecke poverty indexes (1984). Modelling conducted under two separate assumptions: no inflation and economic stagnation and high inflation (2008) and economic stagnation. Predictive modelling to forecast modelling in 2008 and 2010. | Economic stagnation from 5.0% to 5.4% predicted to increase food poverty incidence by 2010. Estimate of the food poverty incidence is statistically significantly higher than the MDGs target of 3%. Inflation led to increase in food poverty incidence from 6.5% to 7.1%.The data suggested that Vietnam would meet the first objective of the MDG (reduction in overall poverty) by 2008 but would have difficulty in achieving a reduction in food poverty by 2010. Poverty and food poverty reduced for both rural and urban areas between 2002–06. |
| Fisher & Lewin, 2013 | Malawi | Malawi’s second Integrated HH survey (IHS-2), part of the Living Standards Measurement Survey (LSMS), 2004-2005 | 11, 280 HHs, across 564 communities. Sub sample used 8,350 rural HHs | *Calorie consumption*HH is considered food insecure if its daily per capita calorie consumption ≤ calorie requirements based on BMR and light activity of all HH members. Energy requirement for each HH member determined from FAO, WHO and UNU average energy requirements for specific age-sex groups BMR and light activity.  | HH energy consumption based on estimated quantities or expenditure of 115 individual food items reportedly consumed, during the week prior to interview. Edible portions sizes assessed using USDA and FAO’s Africa food composition tables. | Multi-level logistic regression model using generalised linear latent and mixed models. Explanatory variables across HH, community, policy and seasonal, including price of goods, price of maize a proxy for agricultural outputs, price of urea (fertilizer) proxy for farm inputs, wages, non-labour income (eg pensions, savings), non-price factors.Calorie needs were based on FAO recommendations, (as per Smith et al, 2006) with addition of 500kcal to HH for each child below one year (to account for additional energy required for lactation)  | District level maize price had a positive relationship to food insecurity in southern region. Fertiliser prices positively correlated with food security in all regions. District level ganyu wage had a positive relationship with food insecurity in central and southern regions. Larger HH size increases probability of food insufficiency. Including children in the HH also increased probability of food insecurity by approximately 25%. Education of HHH significantly and inversely associated with food insecurity.  |
| Geniez et al, 2014 | Nepal | Nepal Living Standards Measurement survey (NLSS-III), 2010/2011 | 1,258 HHs401 HHs from the rural mountain regions. 857 HHs from Kathmandu | *Food basket or similar*Based on the average cost of a basket of food items that meets minimum daily requirements of 2,220kcal/day, at13,294 rupees/person/year (mountain region) and 14,610 rupees/person/year (Kathmandu) Calorie requirements as per Ministry of Agriculture, 2014.*Nutrient poverty line, basket approach*Based on 18,628 rupees/person/year (mountain region) and 22,945 rupees/person/year (Kathmandu). Nutrient requirements for sex, age and physiologic conditionNutrient requirements as per WHO/FAO, 2014. | Food consumption based on 7-day recall of the HH respondent of food consumption and expenditure of 60 food items, volume and monetary values collected. | Food poverty line calculated using the Costs of Basic Needs Approach, a three step approach, firstly determining a usual food consumption pattern, adjusting it to meet energy requirements (2,220 Kcals/day) and finally costing the diet to the region.The sample HH included a moderately active adult male and female with three children aged 12-24months, 11-12 years and 16-17 years. Energy requirements for each member of the HH were summed to provide HH requirements for a range of macro and micro nutrients.The nutrient poverty line was calculated using the Minimum Cost of a Nutritious Diet (Save the Children). Study applied a liner optimization approach with food price data from a survey of local markets. | In the mountainous region, 58% of HHs had food expenditures below the nutrient poverty line; 34% of this group are also below the food poverty line. 24% of HHs did not face affordability constraints in meeting calorie needs, but did in meeting micronutrient needs. In Kathmandu: 7% HHs were food and nutrient poor, 14% were nutrient poor but not food poor and 79% were not food nor nutrient poor. Findings suggest that it is necessary to explore both food poverty line to determine sufficient energy intake and nutrient poverty line as HHs may be energy sufficient but lack essential micronutrients for an active and healthy life. |
| Harttgen et al, 2016 | Malawi | Malawi’s Second Integrated HH Survey (IHS-2) part of the Living StandardMeasurement Surveys (LSMS), 2004/2005 | 11,280 HHs | *Calorie consumption* HH considered food deprived if total kcal consumption < age and sex specific kcal needs for all HH members. The recommended mean energy requirement was 1702 kcals, adjusting for age and sex of the population. Kcal requirements as per FAO, WHO and UNU (2001). Recommended mean energy intakes as supported by Ecker and Qaim (2010). | Food consumption based on purchases, own production and gifts of 108 food items based on a 7 day recall period.  | Energy available per capita is calculated from the HH seven day recall food consumption data and divided by the number of HH members. It is assumed that food is distributed within the HH to cover each member’s dietary needs. To calculate overall food poverty the percentage of HHs or individuals that fall below their food poverty threshold is derived. Food availability measured through kcal availability as per the Smith et al (2006) framework, developed by Frankenberger et al (1997) and UNICEF (1998). Apparent food consumption data converted to kcals per capita per day to assess food security by socio demographics.Simple simulation model used to model effects of price shocks on food poverty. | Average kcal/day/capita consumption varied across rural and urban areas. Mean: 2361kcal; rural: 2326 kcal; urban: 2601kcal. 74%kcal derived from staple foods; 12% from pulses, 9% from meal complements, 4% from animal products and 3% from vegetables and fruits. Overall 28.3% of the population Were considered undernourished (18.8% in urban; 29.7% rural regions). Overall a positive correlation between quintile of income and kcal consumption was found. Other HH variables assessed, such as sex and education level of HHH.  |
| Jones, 2015 | Malawi | Malawi Third Integrated HH Survey (IHS3), 2010-2011 | 12,271 HHs across all regions | *Diet diversity, as per FCS* FCS as per WFP. No criterion as weighted continuous measure.*CSI*(adapted version) | FCS calculated with data collected on foods and beverages consumed by any HH member in the previous 7 days.  | Diet diversity assessed using FCS as per WFP (2007). Food and beverages reported were aggregated into 12 food groups then multiplied by assigned food group weightings. Two-sided Student’s t-tests and Pearson’s chi-squared tests used to assess differences in means and proportions, between urban and rural regions. Bivariate logistic regression to assess relationship between HH food security and consumption of food groups and beverages.Adapted version of CSI (as per Maxwell et al 2003), used 6 questions related to HHs’ direct experiences with food insecurity during the previous 7 days*.* Data on the number of days these conditions experienced were multiplied by severity of weightings to develop a summed score. | Based on diet diversity, 28.3% of the population were considered undernourished (18.8% in urban and 29.7% in rural areas.Mean FCS in urban areas was 67 and 50 in rural areas The CSI was negatively associated with HH dietary diversity and food expenditure/capita. The main drivers of the association between diet diversity scores and food security were meat and dairy products in all HHs. 33% rural and 20% urban HHs reported worrying that the HH would not have enough food at least once during the previous 7 days. 31% rural and 26% urban HHs reported relying on less preferred or less expensive foods because of a lack of resources at least once during the previous 7 days. The mean CSI score was 6.9 in rural areas and 5.0 in urban areas (where higher values indicate more severe food insecurity). |
| Khandker et al, 2012 | Bangladesh | Bangladesh HH Income Expenditure Survey (HIES), 2000 & 2005 | 7440 HHs, 5,040 from rural areas (2000) 10,080 HHs, 6,040 from rural areas (2005)Only rural sample reported on | *Food basket or similar*Assessed as one of three poverty metrics- moderately poor, food poor, and extreme poor. A HH is considered food poor if its per capita food consumption < than the food poverty line of 2,112kcal/per capita/day. Calorie requirements as per FAO/WHO, 1973. | Unspecified  | Food expenditure from HIES data was used as a proxy for “food consumption”. HHs were interviewed at different times of the year, uniformly distributed across four seasons to capture seasonality. The price of rice and kcal intake by season was compared through descriptive analysis.  | In both years, overall calorie consumption is much lower in Rangpur than rest of Bangladesh. Rangpur food expenditure: 2000: 1460 kcal; 2005: 1,742 kcal. Rest of Bangladesh: 2000: 2,164 kcal; 2005: 2,199kcal. Food consumption falls sharply in all regions during the Monga period. Total income affects poverty for both poor and non-poor but income seasonality affects food poverty differently between poor and non-poorMonga period considered to be seasonal food deprivation and occurs during the pre-harvest period when rural HHs lack employment and income. |
| Kumar & Quisumbing 2012 | Ethiopia | Ethiopian Rural HH Survey (ERHS), 1997, 2004, 2009 | Approximately 1,300 HHs across 15 villages A longitudinal dataset  | *Food consumption* Adequacy of food consumption in past month; adequacy unspecified, continuous variable.*Experience of food gapes*Food security assessed by number of months the HH had difficulty “satisfying its food needs” and whether food consumption in the HH for the previous month was adequate (kcal criterion not used). | NA | Food insecurity experiences determined through interviews of the chief female of the HH as part of the ERHS. Kcal criterion not used to determine adequacy, rather adequacy based on the respondent’s perception as part of the interview. The 2009 ERHS round was used to construct and compare outcomes of interest associated with wellbeing such as happiness, and food consumption, based on previous data from the 1997 and 2004 roundsAim was to test whether male or female inherited assets are more important for wellbeing outcomes using statistical modelling. Wellbeing outcomes included food security, poverty-related and Ladders of life, rights and control. These outcomes were both categorical and continuous variables. Probit regression analysis used for categorical variables and ordinary least squares used for continuous variables (based on empirical analysis by Thomas & Chen, 1994). | Female headed HHs more likely to be food-insecure than male headed HHs, reporting they are they are unable to satisfy their food needs in 3.81months, compared with 2.63 months (males). 42% of female headed HHs reported that their food consumption was less than adequate in the past month, compared with 34% of male-headed HHs. Other variables by gender assessed, such as level of schooling and asset ownership.  |
| Mahajan et al 2015 | India | National level HCES, 2009-2010  | 100,794 HHs, 59,097 rural, 41,697 urban | *Calorie consumption*Food poverty criterion based on 2,700kcal/consumer unit/day. Based on requirements of an average male, sedentary work between 20–39 years. The average kcal requirements of males and females of other age groups were expressed as ratios to thisKcal requirements as per Ministry of Statistics and Programme Implementation, Government of India, 2012.*Nutrition security: protein consumption*Recommendation of 60g protein/CU/day. Reference not provided. | Information obtained on all food, fuel and consumer services over a 30 day period by diary. Number of food item commodities unspecified. Four income groups based on monthly per consumer-unit expenditure were calculated for both rural and urban areas. | Modelling used to assess effects of a number of variables such as food prices on kcal and protein consumption. Equation developed similar to D’Souza & Jolliffe, 2014. Ordinary Least Squares and quantile regression used to assess the effect of price rises on kcal intake and protein intake by income groups separately for rural and urban areas.Food consumption was converted using tables from the Nutritive Value of Indian Foods (Gopalan et al, 1991) to calculate nutrient equivalents for kcals, proteins, and fats.  | Higher food expenditure, lower kcal consumption in urban areas. 50% of lower middle income and upper middle income and 25% of high income groups do not meet recommendations for kcal intake. Mean kcal intake for lower income group and lower-middle income group across rural and urban does not reach 2700kcal/consumer unit/day. More than 50% of the low income group obtained less than 80% of recommended kcal intake. Mean protein intake for low income groups across rural and urban is less than 60g/consumer unit/day, 70% of urban and rural poor do not meet this requirement. In both urban and rural areas, price increases products have negative effect on calorie intake. Impacts of price rises are greater on protein intake.  |
| Mahal et al, 2008 | India | Consumer expenditure survey data, as per National Sample Survey Organization (NSSO), 1993-1994 and 1999-2000 | 16 Indian states (sample size of surveys not provided) | *Food basket or similar*Minimum expenditure for pre-defined nutrient basket for rural and urban areas used. Nutrients: kcals, proteins, fat, iron, calcium, beta-carotene, riboflavin, thiamin, niacin, vitamin C and zinc. Nutrient requirements based on the RDAs weighted for age and gender of the populationNutrient recommendations as per Indian Council for Medical Research RDAs, 2002.*Nutrient poverty line, basket approach*Criterion as above. | Food data collected for approximately 125 foods provided in the two consumer expenditure surveys (detail on recall method or time period not provided).Nutrient content of foods derived from a number of National Institute of Nutrition publications (Gopalan et, 2000). | Food poverty lines calculated for each Indian state by rural and urban populations. Region specific dietary adequacy poverty lines (DAPL) calculated by adding minimum non-food expenditures to the estimated food poverty lines.  | The DAPL was higher than the official poverty line in 13 regions which were mainly rural by 10% in 1993-1994 but only 11 regions, mainly rural in 1999-2000. Main differences found in rural areas but not so clear in urban areas. The DAPL reported slower reduction in poverty over time compared to the official poverty line. Big differences in poverty reductions over time were seen in the states that were fastest growing in the 1990s. Using the DAPL suggests large interstate differences in poverty changes between the two surveys. |
| Melgar-Quinonez et al, 2006 | Bolivia, Burkina Faso, and the Philippines | Living Standards Measurement Survey (LSMS), 2003-2004Contains modified 9 items of US HH Food Security Survey Model (HFSSM)   | 327 HHs: Bolivia330 HHs: Burkina Faso349 HHs: PhilippinesConvenience sample from participants of the Credit for Education programs  | *Daily per capita expenditures including food* Food expenditure, based on World Bank’s LSMS. Criterion unspecified as continuous.*Experience scale*Criterion based on modified HFSSM. | Food expenditure based on approximately 75 foods per country. Total HH food expenditure calculated for a one year period aggregated from daily, weekly, monthly and yearly periods.  | Random convenience sample of site chosen in three countries for cross sectional study. Food expenditure aggregates calculated and summed into a total food expenditure value for a 1 year period. Total food expenditure divided by number in the HH to give per capital food expenditure. A continuous variable was created by dividing per capita food expenditure by 365 days. Food security assessed as both continuous and categorical (three categories) variables. Descriptive statistics were calculated as well as one way ANOVA and multiple linear regression models to account for a range of sociodemographic covariates.HH food security experience was determined by modified 9 item US HFSSM (already incorporated into LSMS) Scores from 0-9 (where 0 is most food secure) | Total proportion of daily per capita expenditure on food and cooking fuel ranged from 61%-66%. Mean food insecurity score was lowest in Philippines (2.3), followed by Bolivia (4.5) and Burkina Faso (5.1) (Lower food insecurity score indicates less food insecurity). 51.2% of Burkinabe, 43.34% Bolivian and 14.0% Philippine respondents experienced severe food insecurity.For all country samples, the food secure group (0 points) had a significantly higher total mean DPC food expenditure compared with moderately and severely food insecure categories. Other variables assessed including influence of geographical region (urban and rural) and expenditure on specific food groups.  |
| Mishra & Ray, 2009 | Vietnam | Vietnamese Living Standard Survey (VLSS), 1992/1993 & 1997/1998Vietnamese HH Living Standards Measurement Survey (VHLSS), 2004 | 4,800 HHs: 1992/19936,000 HHs: 1997/1998: 9,189 HHs: 2004   | *Calorie consumption*HH is considered undernourished if consuming <2100kcal/adult equivalent/day. HH considered severely undernourished if consuming <1680kcal/capita/day. Calorie requirements as per GSO, no date provided.*Percentage of expenditure on food*Criterion unspecified as continuous measure.*Dietary diversity*Criterion unspecified as continuous measure. | Analysis based on quantities and expenditure on 45 food items that were aggregated to 10-food groups; included bought and self-produced food. | Kilocalorie consumption assessed through conversion of food quantities to kilos then converted to kcal, using FAO conversion factors. In order to calculate per capita figures, HH size deflator used based on equivalence scale specification as per White & Masset 2002. Use of 2100kcal adult equivalent based on Vietnam’s General Statistical OfficeFor measures of dietary diversity, the 10 food groups were further aggregated into 5 food groups (rice, wheat and other cereals fruit and vegetables, fish, meat and dairy products and alcoholic beverages, other items and eating out). Multivariate regression used to asses variables such as calorie shares and per capita calorie intake with per capita food expenditure.  | The share of food in the budget has declined in all regions. Rural total: 65.04% in 1992/1993, 54.13% in 2004. Urban total: 51.95% in 1992/1993, 43.05% in 2004.There has been an increase in median kcal consumption across all regions. Rural overall: 2571kcal/capita/day in 1992/1993, 3206kcal/capita/day in 2004. Urban overall 2165kcal/capita/day in 1992/1993, 2824kcal/capita/day in 2004. Among food poor HHs, rural overall: 2319kcal/capita/day in 1992/1993, 2505kcal/capita/day. Urban overall, 1661kcal/capita/day in 1992/1993, 2455kcal/capita/day 2004.The percentage of HHs that were undernourished: rural 22.2% in 1992/1993, 6.8% 2004. Urban: 45.9% in 1992/1993, 14.8% in 2004. % HHs severely undernourished: rural: 8.3% 1992/1993, 1.84% 2004. Urban: 213% in 1992/1993, 4.4% in 2004. Difference in changes in dietary patterns with non-poor HHs switching from rice to meat, fish and dairy. Whereas in HH below the poverty line there was a general decline in the consumption of fruit, meats, fish and dairy.Overall rapid improvements to dietary diversity and calorie consumption, mainly in the non-poor through decreased calories from rice, wheat and other cereals, fruit and vegetables to increased calories from meat, fish and dairy products and meals consumed outside the home.  |
| Nguyen & Winters, 2011 | Vietnam | VHLSS, 2004 & 2006 | 4,263 HHs across 8 regions (rural and urban) | *Calorie consumption*Criterion unspecified as continuous measure.*Food expenditure per capita*Criterion unspecified as continuous measure.*Dietary diversity*Criterion unspecified as continuous measure. | Expenditure on 58 food items over the previous 12 months from purchases, home-produced food and in-kind food from VHLSS (data collection method not provided). The 58 food items were aggregated into 8 food groups: cereals and other starches; meat, fish, tofu, rich protein; fats and oils; vegetables; fruits;, milk and other dairy products; sugar and beverages and food away from home. | Calorie consumption was calculated by converting quantity of food consumed into calories, using conversion table, as per Vietnam’s National Institute of Nutrition.Once aggregated, per capita food expenditure and per capita food group expenditures was calculated by dividing expenditures by the number of HH members including children. Expenditures adjusted for regional and time differences in each survey.Dietary diversity calculated from food diversity index using two methods (Simpson and Shannon indices u): number of food groups consumed in the HH based on VHLSS expenditure data; weighting food groups for each food in index determined through monetary terms (expenditure based index) and as caloric terms using (calorie based index). sed. The number of food groups consumed in the HH weighted. Each group weighted by group expenditure shears or kcal shares by food groups.Independent variable was migration. Long term migration defined as a member of the HH left for work and was gone for more than a year. Short term migration defined as a member of the HH who was gone for a cumulative period of six months or more in the previous 12 months. Statistical analysis included descriptive statistics, weighted mean averages and probit longitudinal analysis. Study based on consumer theory.  | Regarding expenditure, cereals and other starches account for 30% of expenditure but 65% of daily per capita kcals. Meat, fish, tofu and rich protein account for 30% of expenditure but only 10% of daily kcals. Short term migrants had higher food expenditures compared to long term migrant. Mean kcals consumed/adult equivalent: 2004 all: 3,130kcal, rural: 3,213kcal, urban: 2,871kcal. 2006 all: 3,083kcal, rural: 3,160kcal, urban 2,856kcal.Short term migration has a positive effect on food consumption, via increased per capita food expenditures and higher kcal/capita consumed. Short term migration also has positive effect on remaining food secure but no significant findings for long term migration. |
| Osberg, 2015 | Tanzania | HH Budget Survey (HBS), 2007Views of the People Survey (VoP), 2007  | 4,987 HHs. 3,460 HHs outside Dar es Salaam and 1,347 HHs in Dar es Salaam | *Food basket or similar*Based on basket consumed by the poorest 50% of Tanzanians. Food poverty line: 13,098 Tanzanian shillings in Dar es Salaam; 10,875 shillings in other urban and 9,574 for rural to meet daily energy requirements/male equivalent of 2,200kcal. Calorie requirements as per National Bureau of Statistics. *Experience of food deprivation*Self -reported food deprivation, as per VoP, using the question: Have there been times during the last year when you didn’t have enough food to eat? Considered food insecure if response is “always/often”.*Combined methods: estimated probability of hunger*Criterion not applicable, as measure of probability.  | Food collection methods and items not provided. The Basic Needs Poverty Line is set at 37% of the Food Poverty Line.  | The VoP had a two-step randomisation process. First a random selection of HHs and secondly a randomly selected member of the HH aged 25 years and over. Of this sample 502 were over age of 60 and this was supplemented by a further sample 855 participants aged 60 years and over (420 males and 435 females).Estimated probability of hunger combined vulnerable groups identified in section 1 with calculation of imputed share of consumption within HHs that contain members of this vulnerable group (elderly women). Qualitative approachRelative frequency compared to base probability of reporting food insecurity | The proportion of females aged 60 was twice the proportion of females aged 25-45 (23% vs 11.2). Percentage of participants who reported ‘always/often’ was 17.1% outside Dar es Salaam compared to 4.6% in Dar es Salaam.Gender parity in Dar es Salaam but not outside. Elderly women have 1.72 greater chance of not have enough food to eat compared to the national average. In addition elderly women’s chances of being food secure are 1.65 higher than the national average if they live in a HH with adults aged 25-59 outside of Dar es Salaam. Using the official poverty rates calculated from the HBS suggest that elderly Tanzanians have similar rates to the general population. This is based on the assumption that there is equal sharing of poverty within the HH. Yet comparison of VoP and HBS suggests that there is elderly disadvantage in HHs as the equal sharing assumptions impacts the poverty gap and normalised poverty gap. |
| Ozughalu & Ogwumike, 2013 | Nigeria | Nigerian Living Standard Survey (NLSS), 2004 | Sample size not provided | *Vulnerability to food poverty*Based on least cost food expenditure and kcal intake at 2900kcal/adult equivalent /day. Calorie requirements as per National Bureau of Statistics, no date provided.  | No detail provided on source of food, data collection or analysis. | Micro economic theory of risk and uncertainty, the expected utility theory; Vulnerability as expected approach (VEP).Least cost approach to create zone-specific food poverty lines (based in part on Stigler, 1945). Food poverty lines were calculated by zones to reflect different food consumption patterns, based on the 15 cheapest foods that gave the highest calorie per naira (currency). Least cost food expenditure then determined through linear programming for each zone using selected food items, prices and 2,900 energy requirements per day adult equivalent. (The daily AE energy requirement considered the official calorie recommended daily allowance as adopted by the National Bureau of Statistics). The representative HHs consisted of 3.79 adult equivalents, the same as the mean FAO HH and the mean size of the HH was five members based on NLSS data.Three step generalised least squares procedure used to estimate magnitude of vulnerability to food poverty adjusting for covariates from the NLSS.  |  61.7% of Nigerians reported to be vulnerable to food poverty. The prevalence varies across zones, rural/urban and north/south divides. Vulnerability to poverty higher in urban (64.6%) than in rural (59.4%) areas. Differences in urban and rural areas results of more agricultural activities, cheaper food and greater support in rural areas. The north are have less risk of food insecurity that the south of the country. |
| Ozughalu 2016 | Nigeria | NLSS, 2004 | Sample size not provided  | *Vulnerability to food poverty* Based on least cost food expenditure and kcal intake at 2900kcal/adult equivalent/day Calorie requirements as per National Bureau of Statistics, no date provided.  | No detail provided on source of food, data collection or analysis. | Update on analysis from previous 2013 study.Revealed preference theory, consumer utility maximisation theory used for theoretical foundation. Food poverty incidence calculated through Foster-Greer-Thorbecke poverty index (1984) using the zone specific food poverty lines.Three step generalised least squares procedure used to estimate magnitude of vulnerability to food poverty similar method to previous paper (see Least cost approach and linear programming) accounting for a number of socio economic and demographic variables. Relationship between HH food poverty and vulnerability to food poverty used cross tabulation and Pearson correlations.No detail methods and sample size of NLSS | In 2004 the incidence of food poverty in Nigeria was 50% whilst 62% Nigerians were found to be vulnerable to food poverty in the future. Of the food poor 70% of are also vulnerable to food poverty, whereas 54% of non -poor are vulnerable to food poverty suggesting that those who are food poor are at greater risk of remaining food poor into the future. |
| Rose & Charlton, 2002 | South Africa | South African Income and Expenditure Survey (IES),1995Data also obtained from HH Subsistence Level series survey  | 28,804 HHs | *Food basket or similar*HH is considered in food poverty if food expenditure < cost of a basic nutritionally adequately diet. *Calorie availability (low energy indicator)*HH is considered to have low calorie availability when: calories available in a HH food supply < total calorie requirements of the members of the HH. | Face to face interviews to collect data on monthly food expenditures and foods consumed from home produced for 124 food items. A monetary value was assigned to home produced food consumption based on median sales prices from the IES. | Food poverty measured as the ratio of HH food spending to the cost of a basic food plan. Nine basic food plans provided by the HH Subsistence level series survey used, based on nine age-gender groups. The plans provided the minimum amount of selected food items that met the nutrient requirements for each group.Low energy indicator (calorie availability) was the ratio of the total energy reported from food purchases and home produced items to the sum of recommended daily energy intakes of each HH member multiplied by 30.Food security variable divided into four categories: food secure, food poverty only, low energy availability only and food insecure (both food poverty and low energy availability). Statistical analysis included descriptive statistics, one way ANOVA and multinomial logit analysis | 43% of HHs were in food poverty and 55% with low energy availability, with 39% of HHs reported to be food insecure. Food insecure HHs spent less money on food and a smaller range of foods than food secure HHs,Bivariate and multivariate results were similar. In bivariate analysis HHs in the lowest quintile of income were 13 times more likely to be food insecure compared to those in the middle quintile. One exception was female head of HHs who, after multivariate analysis had lower odds of being food insecure than males head of HHs.HHs who reported home produced foods had lower odds of reporting food poverty or food insecurity. |
| Sophal et al, 2011 | Cambodia | Nationally representative HH survey as per Cambodia Development Research Institute | 2,235 HHs for survey991 HHs interviewed from 14 target villages | *Dietary Diversity*Food security assessment based on World Food Program scoring. No further detail provided.*Coping strategies*No criterion, as exploratory measure.  | HHs asked to determine how many days they consumed a series of food items in previous 7 days, and to identify the sources of foods consumed. 8 key food group categories used. | Focus groups were conducted to complement HH surveys. FS score using WFP scoring algorithms. Using this method assessment of food consumption was based on the frequency that HHs consumed essential food items and how they were obtained in the previous 7 days. WFP- developed scores then applied to determine whether the HH was food poor. Compared responses in 2007 to 2008. Coping strategies obtained via survey. Questions used not outlined. | 4.3% of Cambodian HHs were chronically food insecure or had poor food consumption. Nearly 50% of those who had poor food consumption were located in rural Tonle Sap, followed by 38% in the plains. Coping strategies included buying cheaper food or reducing the amount of food consumed. Bought food on credit, relied on loans. Descriptive statistics only to provide an overview of the situation.In target villages 62% reported not having enough money to buy food or cover essential expenses in June 2007; increase to 69% in June 2008. 34% target villagers reduced the amount of food consumed, 29% of those in fishing villages did this daily. 12% of villagers planted more or new crops to account for the high food prices |
| Sultana & Kiani, 2011 | Pakistan | Pakistan Social and living standard measurement survey (PSLM), 2007/2008 | 54,686 HHs across 4 provinces (urban and rural areas) | *Food basket or similar (Cost of Calorie Approach)*HH is considered food insecure if per capita expenditure <min kcal required/person in family. Based on 1,702 rupees to achieve minimum daily energy requirements/AE of 2,260kcal. Calorie requirements as per FAO, no date provided. | Unspecified  | To calculate food security, the cost of calorie approach was used as per Foster et al, 1986. Adult equivalent expenditure of food (in rupees) and the kcal consumption/adult equivalent was assessed against the food insecurity level. Binomial logit model used to predict HH food insecurity against a range of socio economic variables such as income and education | Mean income 5,299.79 rupees. The number of dependent HH members has a significant negative effect on food security status. Living in an urban area has a higher likelihood of food insecurity compared to living in rural areas. The head of HH’s level of education above an intermediate level is protective against food insecurity . |
| Szabo et al, 2016 | Bangladesh | Bangladesh HH Income Expenditure Survey (HIES), 2010 Additional sub district level soil salinity data also obtained | 993 HHs across the coastal Ganges-Brahmaputr delta | *Calorie availability*HH is considered food insecure if daily kcal needs > reported intake. No other detail provided.*Percentage of expenditure on food*HH is considered food insecure if total expenditure on food is >75%. | No detail provided on the food expenditure data from the HIES.  | Descriptive statistics and logistic regression modelling used to test outcomes and explanatory variables. One way ANOVA used to assess mean salinity scores, salinity area and food insecure HHs. χ2 statistics used to assess impact of HHs socioeconomic status of food security. Explanatory variables include HH socio-economic characteristics and sub district level soil salinity.  | Overall, approximately 2/3 of population are food insecure with 44.7% of HHs spending more than 75% of their total expenditure on food. Of the sample, 33.2% had insufficient daily kcal intake. A positive association between soil salinity and HH food insecurity was found in the unadjusted analysis (p<0.05). However, the association between levels of soil salinity and HH food security were no longer significant when adjusted for remittances and education. |

Abbreviations:

* NLSS, Nigeria Living Standard Survey
* VHLSS, Vietnam Household Living Standard Survey
* IHS-2, Second Integrated Household Survey
* LSMS, Living Standards Measurement Survey
* NLSS-III, [Third] Nepal Living Standards Measurement survey
* IHS3, Third Integrated Household Survey
* HIES, Household Income Expenditure Survey
* ERHS, Ethiopian Rural Household Survey
* HCES, Household Consumption Expenditure Survey
* NSSO, National Sample Survey Organization
* US, United States (of America)
* HFSSM, Household Food Security Survey Model
* VLSS, Vietnamese Living Standard Survey
* VHLSS, Vietnamese Household Living Standards Measurement Survey
* HBS, Household Budget Survey
* VoP, Views of the People Survey
* IES, Income and Expenditure Survey
* HH, Household
* PSLM, Pakistan Social and Living Standard Measurement Survey
* Kcal, kilocalorie (calorie)
* GSO, General Statistical Office
* MDGs, Millennium Development Goals
* BMR, Basal Metabolic Rate
* FAO, Food and Agriculture Organization
* WHO, World Health Organization
* HHH, Household Head
* USDA, United States Department of Agriculture
* UNU, United Nations University
* UNICEF, United Nations International Children's Emergency Fund
* FCS, Food consumption score
* WFP, World Food Programme
* CSI, Coping Strategies Index
* AE, Adult Equivalent
* ANOVA, Analysis of Variance
* CU, Consumer unit
* g, gram