Measuring Food Consumption: The Foundations

LECTURE 5
A quick reminder

▪ What justifies our interest in collecting **data on food** consumption?

▪ **Food consumption expenditure** is a key component of any measure of living standards (lecture 1), **poverty** (lecture 14), and much more

▪ There are **additional research objectives**, which are useful to keep in mind when designing the food module of the questionnaire:
  ▪ nutrition and food security
  ▪ consumer price indices
  ▪ informing National Accounts
  ▪ ...

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Main references for this lecture
most useful also for the next two lectures

Food data collection in household consumption and expenditure surveys
Questionnaire design challenges for food module

1. Acquisition vs. consumption
2. Recall vs. diary and length of reference period
3. List of food items
4. Meal participation
5. Timing of visits
6. Food away from home
7. Non-standard measurement units
1. Acquisition vs. consumption
Definitions

- **Acquisition**
  coming into possession, taking control of goods

- **Consumption**
  utilizing goods (*i.e.* eating, in the case of food)

- **Mode** of acquisition:
  - purchase
  - own-production
  - in-kind receipt
Acquisition vs. consumption
what to do with the chicken?

- All goods that are consumed have been acquired in some way
- However, acquisition and consumption do not necessarily take place during the same reference period
- During a given period, say previous week, three possibilities:
  - a chicken is acquired and eaten \((A = C)\)
  - a chicken is acquired, but not eaten \((A > C)\)
  - a chicken is eaten, but has been acquired earlier \((A < C)\)
Why definitions matter

- Acquisition and consumption are measured for **different purposes**:
  1) Interest in consumption is justified by interest in estimating a number of things: standard of living, calorie intake, etc.
  2) Interest in acquisition is justified by interest in food security (availability)
  3) Interest in acquisition from purchases (i.e. food expenditure) is justified by CPI weighting, and informing national accounts

- Based on survey objectives, **concept(s)** of interest must be clear, and the **questionnaire** must be unambiguous
Current practices
Smith et al. (2014: )

- Smith et al. (2014) review 100 surveys from developing countries.
- They find that both consumption and acquisition are commonly collected, but poor questionnaire design is common.
- About 25% of surveys were found to include poorly worded questions, ambiguity.
Approaches to data collection
Conforti et al. (2017: 44)

Typically, data on food are collected in one of three ways:

A. **Acquisition**
   Households report on food they acquired through purchases, own production and in-kind transfers. Actual consumption of the same food is not reported.

B. **Combination of acquisition and consumption**
   Households report on food they acquired through purchases, without specifying the amount of food consumed. Food consumption derived from own-production or received from transfers is reported.

C. **Consumption**
   Households report on food actually consumed, and on whether that same food was purchased, own-produced or received as a transfer.
Common questionnaire design issues

Consider the following examples. Comment on each of them by answering these questions:

1. From collected data, could we estimate food consumption? Acquisition? Purchase? All of the above?

2. What about unit values?

3. Can you see any flaws in questionnaire design?
Rule out (or ‘filter’) question

example 1

**M. DEPENSES EN PRODUITS DE CONSOMMATION COURANTE**
**AU COURS DES 15 DERNIERS JOURS**

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>I. Produits alimentaires</td>
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<td>1. Haricot</td>
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<td>2. Patate douce</td>
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<td></td>
</tr>
</tbody>
</table>

**C4D2 Training**
**Usual month?**

**Example 2**

<table>
<thead>
<tr>
<th>MONTHLY CHARACTERISTICS</th>
<th>GIFTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.</strong> - <strong>6.</strong> - <strong>7.</strong> - <strong>8.</strong> - <strong>9.</strong> -</td>
<td><strong>9.</strong> -</td>
</tr>
<tr>
<td>In the past 12 months, how many months have you had expenditure</td>
<td>This expenditure concerns how many members of the household?</td>
</tr>
<tr>
<td>spent on average per month on this</td>
<td></td>
</tr>
<tr>
<td>怎样</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**Quantity purchased of this...**

**Average per month**

<table>
<thead>
<tr>
<th>MONTH</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES 0</td>
<td>► 8</td>
<td>5.- 6.- 7.- 8.-</td>
<td>9.-</td>
<td></td>
</tr>
</tbody>
</table>
**SECTION 12: DIARY OF FOOD AND RECURRING NON-FOOD COMMODITIES**

<table>
<thead>
<tr>
<th>DAY # 1</th>
<th>DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF LINES COMPLETED</td>
<td>Date <strong>/</strong>/__</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM LINE NUMBER</th>
<th>ITEM DESCRIPTION</th>
<th>CODE</th>
<th>UNIT QNTITY</th>
<th>DINARS</th>
<th>1202</th>
<th>1203</th>
<th>1204</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TOTAL QUANTITY</td>
<td>AMOUNT PAID</td>
<td>MAIN SOURCE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BOUGHT OR RECEIVED</td>
<td>OR IMPUTED VALUE</td>
<td>PURCHASED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unit or measurement</td>
<td></td>
<td>GIFT FROM OTHER HOUSEHOLDS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>KILOGRAM</td>
<td></td>
<td>GIFT FROM OUTSIDE THE HOUSEHOLD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lit</td>
<td></td>
<td>PAYMENT FOR WORK</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Number</td>
<td></td>
<td>SELF PRODUCTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NO UNIT</td>
<td></td>
<td>OTHER SPECIFY AFTER ANSWE COD 6</td>
</tr>
</tbody>
</table>

**Quantity acquired**

**Value**

**Mode of acquisition**

**Only acquisition example 3**
Both acquisition and consumption
example 4 (last one)

<table>
<thead>
<tr>
<th>1. Did your household purchase [item] in the past 7 days?</th>
<th>2. What is the total quantity of [item] that your household purchased during the past 7 days?</th>
<th>3. Did your household spend on [item] during the past 7 days?</th>
<th>4. Did your household consume [item] in the past 7 days?</th>
<th>5. What is the total quantity of [item] that your household consumed during the past 7 days, from all the sources?</th>
<th>6. What is the value of [item] that your household consumed during the past 7 days?</th>
<th>7. What is the main source of [item] that your household consumed from during these past 7 days?</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES. 1 NO...2 (+Q4)</td>
<td>quantity</td>
<td>value</td>
<td>YES. 1 NO...2 (+NEXT ITEM)</td>
<td>quantity</td>
<td>value</td>
<td></td>
</tr>
</tbody>
</table>
Evidence on common questionnaire design issues
Smith et al. (2014: 14-15)

1. Acquisition surveys: filter question on something else (18%) – see example 1

2. Routine month surveys: ambiguity about whether respondents should report on the routine month in the recall period or only those months in which any food item is consumed (13%) – see example 2

3. Ambiguity on whether to report on acquisition or consumption (7%)

4. Data collected on food harvested rather than food consumed from home production (3%) – see example 1
Should we collect data on acquisition or consumption?

- It depends on the purpose of the survey (lecture 4)

- **Welfare analysts** would want *consumption* (lectures 1-2)

- **Statisticians** (and others) are also interested in *acquisition* to construct weights for their CPIs

- Conforti et al. (2017) evidence from 81 recent surveys says that the difference in estimated mean acquisition and mean consumption is small, but acquisition is much more variable
Recommendations
FAO and WB (2018: 53-55)

1. Always collect data on all modes of acquisition (purchase, own-production, in-kind receipts), irrespective of whether focus is on amount consumed or acquired.
   - If questionnaire only records food obtained through some sources (such as purchases) there will be underestimation of both consumption and acquisition
   - Pay special care to in-kind receipts that are likely to be missed, such as payments for labor and social programs
   - Be careful not to duplicate information captured in other modules (e.g., employment or social assistance)
Recommendations
FAO and WB (2018: 53-55)

2. Surveys should be designed so that it is clear to respondents, enumerators, and data users what information (consumption, acquisition, or both) is requested and reported

- If consumption: it should be clear whether it is food intended for consumption (including food waste) or food actually consumed (net of food waste)

- If purchases: recommended to add an extra question on how much was consumed out of those purchases, to avoid mixing acquisitions from purchases with consumption from own-production and in-kind receipts
Recommendations
FAO and WB (2018: 53-55)

3. Avoid sources of incomplete or ambiguous enumeration

- Do not use filter questions on consumption to rule out acquisition (and vice versa)
- Avoid filter questions that focus on food purchases
- For own-production, the question must be worded to clearly indicate food consumed from own-production rather than food harvested. If not, values reported may include food entering the household’s production stocks (that is, not for immediate consumption).
2. Recall vs. diary and length of reference period
Definitions: recall and diary

Data on household food consumption (or acquisition) commonly collected in one of two ways:

1. Respondents are interviewed and asked to recall consumption during a specified period (past week, past month...).

2. Households are asked to keep a diary over a reference period (days, weeks...) and record consumption at the moment it takes place.
Definitions: recall period and reference period

- **Recall period**: the period over which respondents are asked to recall their consumption

- **Reference period**: the period over which data collection happens

For example:

- Households are interviewed about food consumption in the past 7 days, over 4 weekly visits

- 7 days = recall period, 28 days = reference period
### Example of recall questionnaire

**Zambia Living Conditions Monitoring Survey (LCMS VII) 2015**

#### Section 11A: Household Expenditure

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
<th>Q7</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAST 2 WEEKS</td>
<td>PURCHASES</td>
<td>OWN PRODUCTION</td>
<td>GIFTS, FOOD FOR WORK, RELIEF FOOD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did this household purchase/consume/receive [ITEM] during the last 2 weeks?</td>
<td>During the last 2 weeks, how much did your household spend on [ITEM]? (IN TOTAL)</td>
<td>How many [UNIT S] of [ITEM] did your household purchase for that amount?</td>
<td>During the last 2 weeks, how many [UNIT S] of own produced [ITEM] did your household consume?</td>
<td>How much would this [ITEM] cost if you were to buy it?</td>
<td>During the last 2 weeks, how many [UNIT S] of [ITEM] did your household receive without payment?</td>
<td>How much would this [ITEM] cost if you were to buy it?</td>
</tr>
<tr>
<td>YES</td>
<td>1</td>
<td>VALUE IN KWACHA</td>
<td>QUANTITY</td>
<td>UNIT CODE</td>
<td>QUANTITY</td>
<td>UNIT CODE</td>
</tr>
<tr>
<td>NO</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DON'T KNOW</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FILL IN PER ROW</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pulses and Legumes**

- **25.** Fresh beans (excl Green beans) unshelled
- **26.** Fresh beans (excl Green beans) shelled

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**Source:** C4D2 TRAINING

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25
Example of diary
Zimbabwe Poverty Income Consumption and Expenditure Survey 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Quantity e.g 2x4kg</th>
<th>Item description</th>
<th>Total value</th>
<th>Kind of consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/6</td>
<td>2x1 loaf</td>
<td>Bread</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>1/6</td>
<td>3x1L</td>
<td>Milk</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>1/6</td>
<td>1x1kg</td>
<td>Beef</td>
<td>5</td>
<td>60</td>
</tr>
<tr>
<td>3/6</td>
<td>1x5kg</td>
<td>Maize meal</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>3/6</td>
<td>2x300ml</td>
<td>Soft drink</td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>3/6</td>
<td>12xquarts</td>
<td>Beer clear</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>
Diary or recall?

- Which approach is better, in terms of the quality of collected data?
- Both methods have **pros and cons**
- In particular, they both have the potential to generate **measurement error**, for different reasons
- Risks need to be carefully evaluated, using empirical evidence
Problems with recall

- Memory can fail: biases related to length of recall period
  - Long recall period
    - Tendency to forget, or memory decay
    - More likely if expenditure is perceived as ordinary, not salient
    - Leads to under-reporting of consumption
  - Short recall period
    - Telescoping: tendency to mistakenly report consumption that has actually taken place outside the recall period
    - More likely if expenditure is perceived as extraordinary, salient
    - Leads to over-reporting of consumption
A short recall overestimates variance, which is a problem for measures of “inadequate intake” (including poverty).
Problems with diary

- In principle, **diary avoids memory fails**, as it is compiled close to the moment in which event (consumption or purchase) occurs.

- In practice, diary keeping introduces other problems:
  - **Respondent burden and fatigue**, particularly when length of diary increases: evidence of “diary exhaustion” (Brzozowski, Crossley and Winter 2017; Gibson 2013)
  - To reduce these issues, high levels of supervision are needed, which imply **high implementation costs** (FAO study of Bangladesh 2010 HIES showed good results with enumerator visits every two or three days)
Alternative methods are unsatisfactory – I/II

Usual month approach

▪ Respondents are asked to report consumption for the “usual month” during the previous year

▪ Advocated by Deaton and Grosh (2000) to capture typical consumption

▪ At best, it is not more effective than simple recall; at worst, it introduces errors related to education of respondents, due to cognitive burden (Fiedler and Mwangi 2017: 25; Friedman et al. 2017)
Alternative methods are unsatisfactory – II/II

Bounded recall

- First visit to household establishes the bound of the recall period for a second visit, which is when the interview actually takes place
- Meant to avoid telescoping errors
- Not yet enough evidence that it offers significant advantages in data quality (Gibson, 2005), while it is more costly to administer (double the visits)
Do these “details” matter?

- Large body of evidence finds that the choice between diary and recall, and of the length of recording periods, can significantly affect results.

- Important papers that studied the impact of survey methodology on consumption and poverty statistics:
  - SHWALITA study in Tanzania (Beegle et al. 2012, Gibson et al. 2015, de Weerdt et al. 2016)
  - Niger (Backiny-Yetna et al. 2017)
The importance of questionnaire design – Tanzania

Beegle et al. (2012)
Overview
Beegle et al. (2012)

- Focus on food consumption
- Benchmark ("gold standard"): personal diary with daily visits
- Experimental design compares benchmark with 7 alternative questionnaires, which vary by method of data capture (recall or diary), level of respondent, length of reference period, number of items in the recall list (which we will cover in lecture 6)
Fielding eight alternative consumption questionnaires

▪ “Our survey experiment entailed fielding eight alternative consumption questionnaires randomly assigned to 4,000 households in Tanzania.”

▪ If questionnaire design did not matter, results from data collected through different questionnaires should not differ too much.
<table>
<thead>
<tr>
<th>Module</th>
<th>Consumption measurement</th>
<th>Food content</th>
<th>N households</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Long list (58 food items)</td>
<td>Quantity from purchases, own-production, and gifts/other sources; Tshilling value of consumption from purchases</td>
<td>504</td>
</tr>
<tr>
<td>2</td>
<td>Long list (58 food items)</td>
<td>Quantity from purchases, own-production, and gifts/other sources; Tshilling value of consumption from purchases</td>
<td>504</td>
</tr>
<tr>
<td>3</td>
<td>Subset list (17 food items; subset of 58 foods)</td>
<td>Quantity from purchases, own-production, and gifts/other sources; Tshilling value of consumption from purchases</td>
<td>504</td>
</tr>
<tr>
<td>4</td>
<td>Collapsed list (11 food items covering universe of food categories)</td>
<td>Tshilling value of consumption</td>
<td>504</td>
</tr>
<tr>
<td>5</td>
<td>Long list (58 food items)</td>
<td>Consumption from purchases: number of months consumed, quantity per month, Tshilling value per month</td>
<td>504</td>
</tr>
<tr>
<td></td>
<td>Usual 12 month</td>
<td>Consumption from own-production: number of months consumed, quantity per month, Tshilling value per month</td>
<td>504</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consumption from gifts/other sources: total estimated value for last 12 months</td>
<td>504</td>
</tr>
<tr>
<td>6</td>
<td>Household diary, frequent visits</td>
<td></td>
<td>503</td>
</tr>
<tr>
<td></td>
<td>14 day diary</td>
<td></td>
<td>503</td>
</tr>
<tr>
<td>7</td>
<td>Household diary, infrequent visits</td>
<td></td>
<td>503</td>
</tr>
<tr>
<td></td>
<td>14 day diary</td>
<td></td>
<td>503</td>
</tr>
<tr>
<td>8</td>
<td>Personal diary, frequent visits</td>
<td></td>
<td>4029</td>
</tr>
<tr>
<td></td>
<td>14 day diary</td>
<td></td>
<td>4029</td>
</tr>
</tbody>
</table>

Notes: Frequent visits entailed daily visits by the local assistant and visits every other day by the survey enumerator for the duration of the 2-week diary. Infrequent visits entail 3 visits: to deliver the diary (day 1), to pick up week 1 diary and drop off week 2 diary (day 8), and to pick up week 2 diary (day 15). Households assigned to the infrequent diary but who had no literate members (about 18% of the 503 households) were visited every other day by the local assistant and the enumerator.

Non-food items are divided into two groups based on frequency of purchase. Frequently purchased items (charcoal, firewood, kerosene/paraffin, matches, candles, lighters, laundry soap, toilet soap, cigarettes, tobacco, cell phone and internet, transport) were collected by 14-day recall for modules 1–5 and in the 14-day diary for modules 6–8. Non-frequent non-food items (utilities, durables, clothing, health, education, contributions, and other; housing is excluded) are collected by recall identically across all modules at the end of the interview (and at the end of the 2-week period for the diaries) and over the identical one or 12-month reference period, depending on the item in question.
Results: diary vs. recall

- Results of a regression of log consumption on dummies indicating module assignment
- Benchmark module: personal diary
- Differences between diaries and recall not clear-cut: other questionnaire features have larger impact
Better data, but at a price
diary supervision and costs

- Quality of reporting in household diaries did not vary much with frequency of visits
- Notable exception: illiterate households, where infrequently supervised diary dramatically underestimates consumption
- Personal diary with frequent (daily or 2-daily) supervision has variable cost at least 6 times as much as recall

US$ per household
(recall = 100)
Results: length of recall period

- Same instrument (recall module, long list), except increase recall period from 7 days to 14 days:
  - 12% average per capita consumption
  - +8 points poverty headcount rate
The impact of household food consumption data collection methods on poverty and inequality measures in Niger

Prospère Backiny-Yetna*, Diane Steele, Ismael Yacoubou Dijma


Abstract

Many countries are faced with the problem of monitoring poverty indicators when different food data collection methodologies have been used in national household surveys over the years. This paper provides a comprehensive analysis of this problem in the case of Niger. The paper assesses the impact of three methods of food data collection on the welfare distribution, and poverty and inequality measures in Niger. The study leverages a food consumption experiment to evaluate the three methods of food data collection implemented in the country’s most recent national household surveys. The first method was 7-day recall, the second was usual month, and the third was 7-day diary. The study finds that there was a large difference in measures of consumption and poverty between the first two methods (which yielded similar results) and the 7-day diary method. Annual per capita consumption from the 7-day recall method was, on average, 28 percent higher than that from the 7-day diary method. This gap exists not only at the mean of the distribution, but at every level. The observed differences in measured annual per capita consumption lead to differences in poverty and inequality measures even when alternate poverty lines are used.
Overview

Backiny-Yetna et al. (2014)

- **Objective**: assess impact of survey methodology on poverty statistics
- **Method**: experimental approach, 3 alternative instruments
- **Motivation**: Three different instruments had historically been used to collect food consumption data in Niger:
  - 2005 CWIQ – **Usual month** consumption, list of ~200 food items
  - 2007 HH Budget Survey – **7 day diary**, open food list
  - 2011 LSMS Survey – **7 day recall**
  - same module for non-food expenditures
- Can comparisons be made about poverty over time in Niger?
Results: diary vs. recall

- 7-day recall has the highest mean of per capita expenditure, 7-day diary has the lowest

- Surprising

- Possible reasons:
  - Telescoping in recall instrument
  - This diary is open-ended (no list of food items to choose from): respondent burden

Mean per capita food expenditure (CFA Francs)
Impact on poverty indicators

- Differences in questionnaire design are responsible for different poverty estimates
- A similar result applies to inequality estimates
- Questionnaire design matters

Table 8
Poverty Indicators by Type of Questionnaire Using the National Poverty Line (Niger).

<table>
<thead>
<tr>
<th></th>
<th>7-day recall</th>
<th>Usual month</th>
<th>7-day diary</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
</tr>
<tr>
<td>Poverty headcount</td>
<td>0.425</td>
<td>0.052</td>
<td>0.465</td>
<td>0.050</td>
</tr>
<tr>
<td>Poverty Gap</td>
<td>0.150</td>
<td>0.024</td>
<td>0.136</td>
<td>0.018</td>
</tr>
<tr>
<td>Squared poverty gap</td>
<td>0.070</td>
<td>0.014</td>
<td>0.053</td>
<td>0.010</td>
</tr>
</tbody>
</table>
Questionnaire design and nutritional outcomes – Tanzania
De Weerdt et al (2016)

The Challenge of Measuring Hunger through Survey

JOACHIM DE WEERDT
IOB, University of Antwerp, and UC3S, KU Leuven

KATHLEEN BRECKLE and JED FRIEDMAN
World Bank

JOHN GIBSON
University of Waikato

1. Introduction

At the World Food Summit in 1996, leaders from 183 countries committed to halving the number of people living in hunger; a commitment they renewed in 2009. Halving the proportion of hungry people between 1990 and 2015 is also part of the Millennium Development Goals (MDGs). Yet, according to the flagship publication of the Food and Agriculture Organization (FAO) of the United Nations, “The State of Food Insecurity in the World” (SOFI), there were still 805 million hungry people worldwide in 2012–14, down from slightly over 1 billion in 1990–92. The same report says developing regions (which account for 98% of the global hunger count) saw the proportion of hungry people drop from 23.4% to 13.3% over the same period (FAO 2014). This slow progress in reducing hunger contrasts with faster progress in reducing extreme poverty, which is another target of the first MDG.

The FAO estimates total yearly energy availability per country from food balance sheets (FBS) and uses survey data to determine how that energy is spread across the population. This information is used to parameterize a distribution function from which the share of the population falling below calorie requirements is determined. The FAO method has been the subject of a heated debate, with criticism from, for example, Smith (1998), Svendberg (1999,
Results: measuring hunger with diary vs. recall

<table>
<thead>
<tr>
<th>Module</th>
<th>Mean Kilocalories per Capita</th>
<th>Hunger Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Long list of 58 food items; 14 day recall</td>
<td>1,794</td>
<td>.683</td>
</tr>
<tr>
<td></td>
<td>(1,723–1,865)</td>
<td>(.639–728)</td>
</tr>
<tr>
<td>2. Long list of 58 food items; 7 day recall</td>
<td>2,129</td>
<td>.481</td>
</tr>
<tr>
<td></td>
<td>(2,055–2,203)</td>
<td>(.432–.531)</td>
</tr>
<tr>
<td>3. Short list of 17 food items; 7 day recall*</td>
<td>2,066</td>
<td>.484</td>
</tr>
<tr>
<td></td>
<td>(2,001–2,131)</td>
<td>(.435–.534)</td>
</tr>
<tr>
<td>4. Long list of 58 food items; usual 12 month recall</td>
<td>1,909</td>
<td>.594</td>
</tr>
<tr>
<td></td>
<td>(1,823–1,995)</td>
<td>(.546–.642)</td>
</tr>
<tr>
<td>5. 14 day household diaries with frequent visits</td>
<td>2,412</td>
<td>.268</td>
</tr>
<tr>
<td></td>
<td>(2,340–2,485)</td>
<td>(.223–.313)</td>
</tr>
<tr>
<td>6. 14 day household diaries with infrequent visits</td>
<td>2,517</td>
<td>.230</td>
</tr>
<tr>
<td></td>
<td>(2,443–2,591)</td>
<td>(.186–.275)</td>
</tr>
<tr>
<td>7. 14 day individual diaries with frequent visits</td>
<td>2,677</td>
<td>.188</td>
</tr>
<tr>
<td></td>
<td>(2,599–2,755)</td>
<td>(.148–.228)</td>
</tr>
</tbody>
</table>

Note. N = 3,520; 95% confidence intervals in parentheses.
* The 17 foods account for 77% of the food budget, so calorie availability is scaled up by 1/.77.
Recap of the evidence

- **Recall vs. diary**: questionnaire design choices matter for results on consumption, poverty, nutrition...

- In order to yield high-quality data in low-income and rural contexts, **diary requires frequent, costly supervision**

- **Recall period**: food consumption tends to be underestimated with longer recalls

- Little evidence in support of **alternative methods** (e.g., “usual month” and “bounded recall”)
Current practice
Smith et al. (2014)

- Variety of recall periods
- “other” includes the usual-month approaches and multiple recall periods

Pie chart showing distribution:
- 41% diaries
- 24% 1 week
- 7% 2 weeks
- 5% 1 month
- 23% other
Recommendations
FAO and WB (2018: 50-53)

1. While a **diary approach** may be the “gold standard” with close supervision and careful implementation, it is not suitable for resource-constrained statistical offices in low- and middle-income countries.

2. Low-income countries are advised to adopt **recall interviews and a 7-day recall period**, as this method provides a good balance between accuracy and cost-effectiveness.

3. Any survey using diary methods must be closely supervised to ensure compliance. The reference period should not exceed **2 weeks**.
Recommendations
FAO and WB (2018: 50-53)

3. The “usual month” approach should not be used.

4. Any change in recall period or data collection method (diary vs. recall) should be accompanied by an experimental component aimed at assessing the change in survey estimates.

5. The evidence in Beegle et al. (2012), De Weerdt et al (2016), and Backiny-Yetna et al. (2017) will hopefully serve as a useful reminder.
Lessons learned

▪ Quality data on food consumption are crucial for several research objectives, living standards measurement being one of them

▪ **Questionnaire design matters**: large impact on final results

▪ This lecture has explored some foundational choices in the design of the food module:
  - Should we measure consumption or acquisition?
  - Should we use diary or recall? How should the reference period be set?

▪ **Experimental evidence** provides guidance.
References

Required readings


Suggested readings


Fiedler, J. L. and Mwangi, D. M. 2016. “Improving household consumption and expenditure surveys’ food consumption metrics: developing a strategic approach to the unfinished agenda”. IFPRI


Thank you for your attention
Homework
Exercise 1 – Engaging with the Literature

▪ Read Gibson (2005) chapter 5 “Measurement Error in dietary assessment”.  
▪ Write a short essay (not to exceed 3,000 characters) where you summarize the main findings.
Exercise 2 – Acquisition vs. consumption

Look at the following examples of recent questionnaires. Ask yourself what they would allow you to estimate:

- total value of food consumption?
- total value of food acquisition?
- both?
- none?

For each example, shade the parts of the diagram for which you would be able to provide an estimate.
# Example 1

**SECTION 5A: FOOD LAST 7 DAYS**

1. Over the past one week (7 days), did you or others in your household consume any [ITEM]? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS.

<table>
<thead>
<tr>
<th>CEREALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teff</td>
</tr>
<tr>
<td>2. Wheat</td>
</tr>
<tr>
<td>3. Barley</td>
</tr>
<tr>
<td>4. Maize</td>
</tr>
<tr>
<td>5. Sorghum</td>
</tr>
<tr>
<td>6. Millet</td>
</tr>
<tr>
<td>60. Other cereal (SPECIFY)</td>
</tr>
</tbody>
</table>

2. How much in total did your household consume in the past week?

3. How much came from purchases?
   IF NONE RECORD 0 AND SKIP TO Q5.

4. How much did you spend?

5. How much came from own production?
   IF NOT CONSUMED FROM OWN PRODUCTION RECORD 0.

6. How much came from gifts and other sources?
   IF NONE RECORD 0.
Consumed during ref period

Acquired during ref period

- purchased
- own-produced
- received in-kind
<table>
<thead>
<tr>
<th>N°PASS</th>
<th>N°ZD</th>
<th>N°MENAGE</th>
</tr>
</thead>
</table>

**SECTION C : CONSOMMATION DU MENAGE DES 7 DERNIERS JOURS**

<table>
<thead>
<tr>
<th>CODE</th>
<th>Libellé des Produits</th>
<th>MONTANT EN FCFA</th>
<th>CODE</th>
<th>QUANTITE</th>
<th>UNITE</th>
<th>MONTANT EN FCFA</th>
<th>QUANTITE</th>
<th>UNITE</th>
<th>MONTANT EN FCFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0111</td>
<td>Céréales et produits à base de céréales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>011101</td>
<td>Riz</td>
<td></td>
<td>01</td>
<td>quart de kg</td>
<td>07</td>
<td>litre</td>
<td>16</td>
<td>litre</td>
<td>16</td>
</tr>
<tr>
<td>011102</td>
<td>Maïs</td>
<td></td>
<td>02</td>
<td>sac de 25kg</td>
<td>08</td>
<td>demi litre</td>
<td>13</td>
<td>demi litre</td>
<td>13</td>
</tr>
<tr>
<td>011103</td>
<td>Sorgo</td>
<td></td>
<td>03</td>
<td>sac de 50kg</td>
<td>09</td>
<td>grosse boîte de tomate</td>
<td>14</td>
<td>gros boîte</td>
<td>14</td>
</tr>
<tr>
<td>011104</td>
<td>Fonio</td>
<td></td>
<td>04</td>
<td>kg</td>
<td>10</td>
<td>tine</td>
<td>25</td>
<td>tine</td>
<td>25</td>
</tr>
<tr>
<td>011105</td>
<td>Petit mil</td>
<td></td>
<td>05</td>
<td>demi kg</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Example 2**

C02. How much did the household spend to purchase [PRODUCT] during the last 7 days?

1=Yes
2=No
If No, skip to the next product