Describing data

LECTURE 15
The dissemination phase

- Last step of the journey

- Typically, after survey and data processing are concluded, a report is released, aimed at describing main findings from survey
Dissemination of main findings

- **Benefits**
  - Inform general public, researchers, specialists
  - Influence policy decisions
  - Promote NSO itself: credibility increases through transparency

- **Risks**
  - Exposure to criticism and contradiction
  - Loss of exclusivity
  - Lack of technical capacity to do the dissemination

- **Costs**
  - Creating and documenting data files
  - Creating access tools and safeguards
  - Responding to inquiries
The dissemination report

Varies according to topics of the survey, target audience, etc., but there are some common elements:

1. **Background information** on sampling
2. **Descriptive statistics** (roughly corresponding to survey modules)
3. In the case of income and expenditure surveys, measures of **inequality and poverty**

Next slides cover these 3 points, with tips for effective presentation and examples.
1. Background information
The need for background information

- Survey reports are usually designed to be accessible to a non-technical audience.

- But technical background information must still be present, to inform more advanced readers and facilitate comparisons over time and across countries.

- Background information can be presented separately from “core” results, as introductory chapters, appendices, or even a companion document, but must not be omitted.
What not to miss

- Reports should document at least the following survey design features and processing choices:
  a. Sampling design
      Sample size, stratification, representativeness...
  b. Data collection and processing
      Fieldwork, outlier detection and treatment, data imputation...
  c. Definitions of economic concepts and aggregates used
      E.g. disposable income, total household consumption, imputed rent... May be presented as a glossary
Documentation on sampling design

what to include

- Sampling design report with
  - Allocation of sample into strata and indication of excluded strata, if any
  - Estimation formulas (selection probabilities and weights)

- Household listings forms

- Sample frames
  - For the first sampling stage/s: list of all sampling units
  - For the last sampling stage: list of all households in each sample point

- Non-response rates

- On the survey datasets
  - Sampling weights
Kenya, 2015
Kenya Integrated Household Budget Survey (KIHBS)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>2015/16 KIHBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample design</td>
<td>National, 47 Counties, Rural/Urban</td>
</tr>
<tr>
<td></td>
<td>NASSEP V (5,360 Clusters)</td>
</tr>
<tr>
<td>Sample Size &amp; Allocation</td>
<td>24,000 Households (2,400 Clusters)</td>
</tr>
<tr>
<td></td>
<td>14,120 Households (1,412 Clusters)</td>
</tr>
<tr>
<td>National</td>
<td>9,880 Households (988 Clusters)</td>
</tr>
<tr>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td></td>
</tr>
</tbody>
</table>

CHAPTER ONE
Introduction and Survey Methodology
1.10 Survey response rates

The survey achieved high sample response rates. Nationally, 91 per cent of the sampled households participated and completed questionnaires. As shown in Table 1.2, from 23,852 households that were sampled for the survey, a total of 21,773 households were successfully interviewed. The response rate for rural households was higher (93.6%) compared to that of urban households (88.0%). Part of the non-response was due to non-coverage of 13 clusters spread across different counties occasioned by either insecurity or non-availability of households due to movement of populations in nomadic areas.

Table 1.2: Response rates

<table>
<thead>
<tr>
<th>Result</th>
<th>Residence</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Households selected</td>
<td>9,870</td>
<td>13,982</td>
</tr>
<tr>
<td>Households interviewed</td>
<td>8,681</td>
<td>13,092</td>
</tr>
<tr>
<td>Household response rate</td>
<td>88.0</td>
<td>93.6</td>
</tr>
</tbody>
</table>
Documentation on fieldwork
what to include

- Training
  - Calendar
  - Quizzes
  - Evaluation forms and selection procedures
- Composition and territorial deployment of the field teams
- Dates of field work
- Problems encountered
- Changes to field procedures
- Supervision forms
- Non-response rates, by interviewer
1.6.3 Fieldwork

A centralized approach to data collection was employed through which 13 mobile field teams grouped at the UBOS headquarters were deployed to the different sampled areas. Each team comprised one field supervisor, three or four enumerators and a driver. The field staff were recruited based on fluency of the local language spoken in the respective region of deployment while the supervisors were balanced between males and females. Prior to the deployment of fieldwork teams, ten listing teams each comprising of a team leader and two listers were constituted to update the number of households within the sampled EAs.

At the headquarters, a team of regional and senior supervisors undertook several other survey activities in line with the survey including data scrutiny, field monitoring, coordination and supervision among others. The field data collection commenced at the end of June 2016 and was completed in June 2017. Fieldwork was carried out in 12 separate trips, between which teams met at the headquarters for refresher training and debriefing sessions. During the meetings, the main issues discussed included logistical and data collection challenges which were resolved instantly.
Documentation on the construction of final databases

What to include

- Number of households included
  - Reasons for exclusions
  - Distribution of households
- Number of individuals included
- Unique identifiers
- How to merge files
- Problems encountered
- Methodology to construct aggregates
# Egypt, 2015
Household Income, Expenditure and Consumption Survey (HIECS)

## Expenditure Aggregates

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Variable label/Expenditure item code</th>
<th>Variable content/Expenditure item label</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREDUC</td>
<td>Expenses on pre-primary and primary education</td>
<td>Includes also expenses on literacy programs for students too old for primary school, including private tutoring and tutoring groups</td>
</tr>
<tr>
<td>value.1010101</td>
<td></td>
<td>Pre-school school fees</td>
</tr>
<tr>
<td>value.1010102</td>
<td></td>
<td>Primary school fees</td>
</tr>
<tr>
<td>value.1010104</td>
<td></td>
<td>Primary private tuition fees</td>
</tr>
<tr>
<td>value.1010105</td>
<td></td>
<td>Primary strengthening lessons fees</td>
</tr>
</tbody>
</table>
Other documentation
What to include

- Organizations included in preparation of work
- List of data sets and contents
- Codes not found in the questionnaire
  - Occupation codes
  - Industry codes

- Other information
  - Exchange rates
  - Consumer Price Index
- Supervisor control forms
- Questionnaire control forms
- Maps
- Abstract
2. Descriptive statistics
How to describe data effectively

- Text
- Tables
- Graphs
Effective writing complements good tables and graphs

This lecture will focus on the latter: writing deserves a separate discussion

A useful reference
Tables

- Tables are omnipresent in data dissemination reports.
- Often used when describing two variables jointly (two-way tables), e.g. income by region, population by age...
Table elements
UNECE (2009: 12)

<table>
<thead>
<tr>
<th>Notes</th>
<th>Source</th>
</tr>
</thead>
</table>

Row stubs | Column headers | Data

---

C4D2 Training
What makes a good table

Golden rule #1

Express contents clearly

1. The table title should answer the questions “what”, “where” and “when”, but still be concise

2. Tables should be self-contained: use notes to clarify definitions, abbreviations, etc.

3. Percentage distributions of discrete variables should be clearly identified as either percentages of households or percentages of the population

4. Row and column totals should be reported, when they identify a marginal distribution
What makes a good table

Golden rule #2

Reduce clutter

1. Avoid unnecessary colors, repetitions (e.g. use % or $ just once, in the title, rather than throughout the table)

2. Precision of numbers: do not present too many significant digits. Percentages: one decimal digit is usually enough. Numbers with four or more digits: no decimals at all. Large numbers: express them in thousands or millions

3. Be mindful of spacing and alignment
What’s wrong with this table?

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>27.81</td>
<td>27.92</td>
<td>28.24</td>
<td>31.12</td>
<td>36.82</td>
<td>39.48</td>
<td>39.13</td>
</tr>
<tr>
<td>Residential</td>
<td>31.11</td>
<td>33.91</td>
<td>30.41</td>
<td>27.61</td>
<td>24.33</td>
<td>23.71</td>
<td>23.97</td>
</tr>
<tr>
<td>Industry</td>
<td>31.47</td>
<td>27.21</td>
<td>23.86</td>
<td>22.11</td>
<td>21.41</td>
<td>19.53</td>
<td>18.78</td>
</tr>
<tr>
<td>Agriculture</td>
<td>n/a</td>
<td>n/a</td>
<td>3.51</td>
<td>3.7</td>
<td>3.11</td>
<td>2.91</td>
<td>2.82</td>
</tr>
<tr>
<td>Services</td>
<td>9.61</td>
<td>10.96</td>
<td>13.98</td>
<td>15.46</td>
<td>14.33</td>
<td>14.37</td>
<td>15.3</td>
</tr>
</tbody>
</table>

Source: UNECE (2009: 12)
Share of total energy consumption, by sector (in percent)
Ireland, 1980-2003

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>27.8</td>
<td>27.9</td>
<td>28.2</td>
<td>31.1</td>
<td>36.8</td>
<td>39.5</td>
<td>39.1</td>
</tr>
<tr>
<td>Residential</td>
<td>31.1</td>
<td>33.9</td>
<td>30.4</td>
<td>27.6</td>
<td>24.3</td>
<td>23.7</td>
<td>24.0</td>
</tr>
<tr>
<td>Industry</td>
<td>31.5</td>
<td>27.2</td>
<td>23.9</td>
<td>22.1</td>
<td>21.4</td>
<td>19.5</td>
<td>18.8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>n/a</td>
<td>n/a</td>
<td>3.5</td>
<td>3.7</td>
<td>3.1</td>
<td>2.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Services</td>
<td>9.6</td>
<td>11.0</td>
<td>14.0</td>
<td>15.5</td>
<td>14.4</td>
<td>14.4</td>
<td>15.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

1 Data on energy consumption for the agricultural sector was not collected until 1990.

Source: Department of Public Enterprise, Ireland

Source: UNECE (2009: 12)
Graphs

- In many cases, presentation of data can be made more interesting and intuitive by using graphs or charts rather than tables.

- Many of the “golden rules” that help make better tables also apply to graphs.
What makes a good graph
Golden rule #3

Express contents clearly

1. A good graph title answers the same questions as a good table title
2. Graphs should be self-contained too (use notes)
3. Explain encoding: always label axes and data series clearly
4. Avoid visualizations that mislead the eye: two notorious “sins” are bar charts with a nonzero baseline, and 3D pie charts
Bar charts with nonzero baseline

- Bar charts rely on bar length to show data: compare lengths to compare values.

- Shifting the baseline distorts the visual: a value twice as high no longer corresponds to a bar twice as long.

- Graphs on the right show the same data, but appear very different.
3D pie charts

- Pie charts encode data in the area of each slice: larger slice equals higher share
- A 3D pie chart **distorts angles**, making the slice that is “closer” to the viewer appear larger than it actually is
- This visualization can **mislead** viewers, and should be avoided

What makes a good graph
Golden rule #4

Reduce clutter

1. Again, avoid unnecessary colors and decorative elements that obfuscate the message of the graph

2. Precision of numbers: same recommendations as for tables

3. Do not crowd graph with too many data points: viewer should be able to understand the message of the graph easily, without having to parse too much visual information (if that is the issue, select a subset of relevant values, or consider using a table instead)
“Because pie charts force readers to make comparisons using the areas of the slices or the angles formed by the slices—something that our visual perception does not accurately support — they are not an effective way to communicate information”
Schwabish (2014: 223)
Graph redesign

A pie chart, labeled

Pie chart alternative: a bar or column chart

Source: Schwabish (2014: 223)
What’s wrong with this graph?

Source: Schwabish (2014: 218)
Graph redesign

Source: Schwabish (2014: 220)
What’s wrong with this graph?
Zambia, Living conditions monitoring survey report 1996 and 2015

Incidence of poverty rural/urban, 1996

Incidence of poverty rural/urban, 2015
3. Inequality and poverty
Overview

- Tips for presentation of generic summary statistics still apply

- There are a few additional points to be made specifically about presenting results on poverty and inequality:
  
  a. Popular measures and graphics (from lectures 13 and 14)

  b. Best practices for making comparisons
Suggested inequality measures
Malawi poverty assessment IHS2 IHS3, Inequality indices

- **Gini** is so prevalent internationally that it *cannot be omitted*, the rest is extra credit

<table>
<thead>
<tr>
<th></th>
<th>Malawi</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE (-1)</td>
<td>0.28</td>
<td>0.41</td>
<td>0.48</td>
</tr>
<tr>
<td>Theil L (GE(0))</td>
<td>0.25</td>
<td>0.34</td>
<td>0.39</td>
</tr>
<tr>
<td>Theil index (GE(1))</td>
<td>0.31</td>
<td>0.42</td>
<td>0.44</td>
</tr>
<tr>
<td>GE (2)</td>
<td>0.58</td>
<td>0.96</td>
<td>0.73</td>
</tr>
<tr>
<td>Gini</td>
<td>0.39</td>
<td>0.45</td>
<td>0.48</td>
</tr>
</tbody>
</table>
Suggested inequality charts

- **Lorenz curve**
  Zambia, Living conditions monitoring survey report 2015

- **Overlayed CDFs**
  Kenya gender and poverty assessment 2015/16
Suggested poverty measures
2015/16 Kenya Integrated Household Budget Survey (KIHBS)

- **FGT**, the rest is extra credit

Table 4.3: Overall Poverty Estimates (Individual) by Residence and County, 2015/16

<table>
<thead>
<tr>
<th>Residence / County</th>
<th>Headcount Rate (%)</th>
<th>Distribution of the Poor (%)</th>
<th>Poverty Gap (%)</th>
<th>Severity of Poverty (%)</th>
<th>Population ('000)</th>
<th>Number of Poor ('000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>36.1</td>
<td>100.0</td>
<td>10.4</td>
<td>4.5</td>
<td>45,371</td>
<td>16,401</td>
</tr>
<tr>
<td>Rural</td>
<td>40.1</td>
<td>71.3</td>
<td>11.5</td>
<td>5.0</td>
<td>29,127</td>
<td>11,687</td>
</tr>
<tr>
<td>Peri-Urban</td>
<td>27.5</td>
<td>5.6</td>
<td>6.9</td>
<td>2.6</td>
<td>3,340</td>
<td>920</td>
</tr>
<tr>
<td>Core-Urban</td>
<td>29.4</td>
<td>23.1</td>
<td>8.9</td>
<td>3.9</td>
<td>12,905</td>
<td>3,795</td>
</tr>
</tbody>
</table>
Making comparisons

- Many audiences (policy makers, general public) are especially interested in comparisons of poverty and inequality, over time or across regions.
- Poverty and inequality trends are among the most visible and impactful results to emerge during dissemination.
- Comparability of underlying data and methods is key: if processes that led up to estimates differ, comparison is invalid.
- Being transparent on comparability is key!
Changes in data and methodology

▪ **Comparability** of data and methods underlying the estimates that are being presented is key

▪ If processes that led up to estimates differ, comparison is **invalid** and readers may be misled

▪ **Minimize** incomparability

▪ If some discrepancies remain, be fully **transparent**
The analysis of the poverty trend is challenged by changes in the HBS design, but the adjustments made to counter the change in design support the decline of poverty. Assessing the changes in poverty levels over time is subject to issues of comparability stemming from changes in the survey design and methodological improvements implemented during the 2011/12 HBS. These issues were addressed using different methods, including the reevaluation of the consumption aggregates for HBS 2007 using the same approach as in 2011/12, as well as nonparametric and parametric imputation procedures. The different

---

**Figure ES.1 Poverty and Extreme Poverty Incidence**

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2011/12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty headcount (Basic needs poverty line)</td>
<td>34.4%</td>
<td>28.2%</td>
</tr>
<tr>
<td>Extreme poverty headcount (Food poverty line)</td>
<td>11.7%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

*Source: HBS 2007 and 2011/12.*
Tanzania, 2012
Poverty Assessment, HBS 2007 and 2011/12 recall modules

<table>
<thead>
<tr>
<th>Consumption and expenditure categories</th>
<th>HBS 2011/12 Recall period (months)</th>
<th>HBS 2007 Recall period (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Clothing and footwear (COICOP 3)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Housing and utilities (COICOP 04 + selected other)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Rents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing equipment (COICOP 05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household durables, furniture and furnishings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small household appliances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditures on domestic workers</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Health expenditures (COICOP 06)</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
The importance of uncertainty

- Poverty calculations are based on a sample of households, and samples carry a margin of error in representing the population.
- Standard errors should always be estimated along with poverty point estimates.
- Crucial when making comparisons (over time, across regions): poverty changes should not be taken at the face value.
- Note: probability weighting, clustering, and stratification, are survey design features which must be taken into account when estimating standard errors.
Table 9: Poverty indices in 2015/16

<table>
<thead>
<tr>
<th>Index</th>
<th>Estimate</th>
<th>Std. Err.</th>
<th>[95% Conf.]</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty head count index</td>
<td>0.235</td>
<td>0.008</td>
<td>0.220</td>
<td>0.250</td>
</tr>
<tr>
<td>Poverty gap index</td>
<td>0.067</td>
<td>0.003</td>
<td>0.061</td>
<td>0.073</td>
</tr>
<tr>
<td>Poverty severity index</td>
<td>0.028</td>
<td>0.002</td>
<td>0.024</td>
<td>0.031</td>
</tr>
<tr>
<td>Food poverty head count index</td>
<td>0.248</td>
<td>0.008</td>
<td>0.233</td>
<td>0.263</td>
</tr>
<tr>
<td>Food poverty gap index</td>
<td>0.067</td>
<td>0.003</td>
<td>0.061</td>
<td>0.073</td>
</tr>
<tr>
<td>Food poverty severity index</td>
<td>0.027</td>
<td>0.002</td>
<td>0.024</td>
<td>0.030</td>
</tr>
</tbody>
</table>

Source: computed from the 2015/16 HICE survey data
Sensitivity Analysis
Bosnia and Herzegovina, 2003 (vol. II)

Report No. 25343-BIH

Bosnia and Herzegovina
Poverty Assessment

(In Two Volumes) Volume II: Data on Poverty

November 21, 2003

Poverty Reduction and Economic Management Unit
Europe and Central Asia Region
VI. CHECKS FOR ROBUSTNESS OF POVERTY FINDINGS

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   (v) Household Size .................................................. 64

D. Conclusions .......................................................... 64
### Table 6.2  Key characteristics of poverty and its robustness to measurement assumptions.

<table>
<thead>
<tr>
<th>Characteristics of poverty</th>
<th>Baseline, consumption per capita</th>
<th>OECD I scale</th>
<th>OECD II scale</th>
<th>Higher poverty line</th>
<th>Lower poverty line</th>
<th>Expenditure per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed (semi-urban) municipalities in RS</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Rural municipalities in FBiH</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>IDPs and Refugees</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Households headed by persons with low education (primary or less)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Households headed by persons with education above secondary</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Unemployed (ILO) and inactive adults</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Employed according to registration</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Registered unemployed</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Household headed by elderly</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Larger households</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

Source: Staff estimates based on BiH-LSMS 2001.
Lessons learned

1. **Explain clearly** what your table or graph is showing (titles, labels, notes...)

2. Only if point 1 is checked, **reduce clutter**: keep frills to a minimum

3. When showing results on **inequality and poverty**, include the shortlist of key measures and graphs indicated in this lecture, which the international community has come to expect

4. Comparisons: **document** changes in data and methodology, and include measures of **uncertainty** of estimates whenever possible
References

Required readings


Suggested readings


Suggested websites and blogs (tutorials, tips, data visualization examples)

Alberto Cairo: thefunctionalart.com
Stephanie Evergreen: stephanieevergreen.com
Nathan Yau: flowingdata.com
Jonathan Schwabish: policyviz.com
Thank you for your attention
Homework
EX. 1 – Engaging with the literature

- The dissemination of microdata often (but not always) accompanies the dissemination of findings and summary statistics from a survey.

- Summarize the discussion of the pros and cons of data dissemination in Dupriez et al. (2010) p. 16-23
  
  http://ihsn.org/sites/default/files/resources/IHSN-WP005.pdf
Exercise 2 - Standard Errors
Poverty analysis of the integrated household survey in The Gambia 2003 (p49-50)

- Compare point estimates with interval estimates, assuming a 95% confidence level, and briefly comment on results
Exercise 3 - Sensitivity analysis
Myanmar Poverty and Living Conditions Survey 2015

- Briefly comment on the robustness of the poverty line to different calorie norms.
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