Revision of the methodology for the estimation of the Prevalence of Undernourishment

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Outline

- Background

- The FAO methodology to compute the Prevalence of Undernourishment

- The 2011/12 revision

- Conclusions and recommendations

Background

- FAO food security monitoring:
  - World Food Surveys (1946, 1952, 1963, 1977, 1987, 1996)
  - The State of Food Insecurity in the World (1999 -)
  - World Food Summit
  - Millennium Development Goals
- … always debated
 - FAO International Symposium 2002
  - CFS Round Table 2011

Insights from experts

- The PoU methodology is sound: no superior alternative for annual global monitoring, given available data

- Precision can be improved

- A comprehensive picture of food insecurity requires more indicators: essential consumption may be missing while caloric intake is maintained (amino-acids, vitamins, etc.)

- The suite of food insecurity indicators: core set allowing monitoring of the four dimensions of food Security: availability, access, utilization and stability

The PoU methodology

Comparison of a probability distribution of habitual daily Dietary Energy Consumption with a Minimum Dietary Energy Requirement

$$PoU \equiv \int_{x<MDER} f(x)dx$$
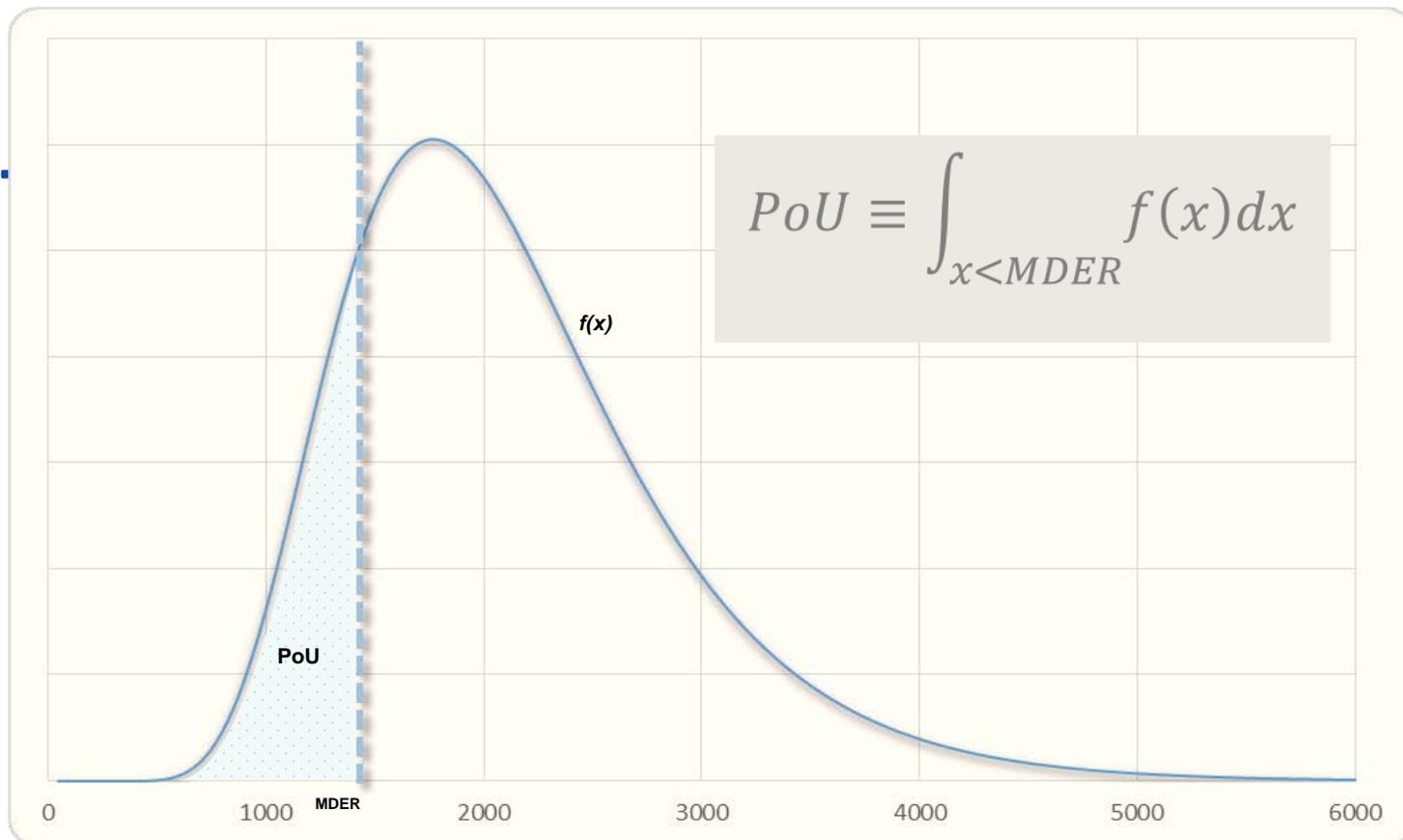
The PoU methodology

- PoU: probability that a randomly selected individual consumes an amount of calories insufficient for conducting an active and healthy life

- Model referred to representative consumer

- Number of Undernourished (NoU) is obtained by multiplying PoU by population size

- PoU is not based on a headcount: individual requirements and consumption are virtually unobservable

How to implement the methodology – 1

- Distribution:
  - represent the probability associated with calorie consumption of a randomly selected individual
  - Needs to be strictly positive and shows natural limits
  - Possibly positively skewed
  - The log normal was adopted in 1996

- Parameters:
  - Mean from Food Balance Sheets (still preferred option, but concerns on coverage, precision, extent of food losses)
  - CV of food consumption: many estimated indirectly; few from surveys

How to implement the methodology -- 2

- Threshold: Minimum Dietary Energy Requirement (MDER), or sex and age range weighted average requirement
  - minimum acceptable BMI (5th percentile for adults, median BMI for <10 yrs) and PAL =1.55
- Requirements vary due to many reasons: income, season, body size, metabolism, food preferences, education, culture
- Why the minimum?
  - Minimum compatible with good health and low physical activity to minimize the probability of overestimating undernourishment.
  - Threshold must be below the average requirement: overnourished vs undernourished
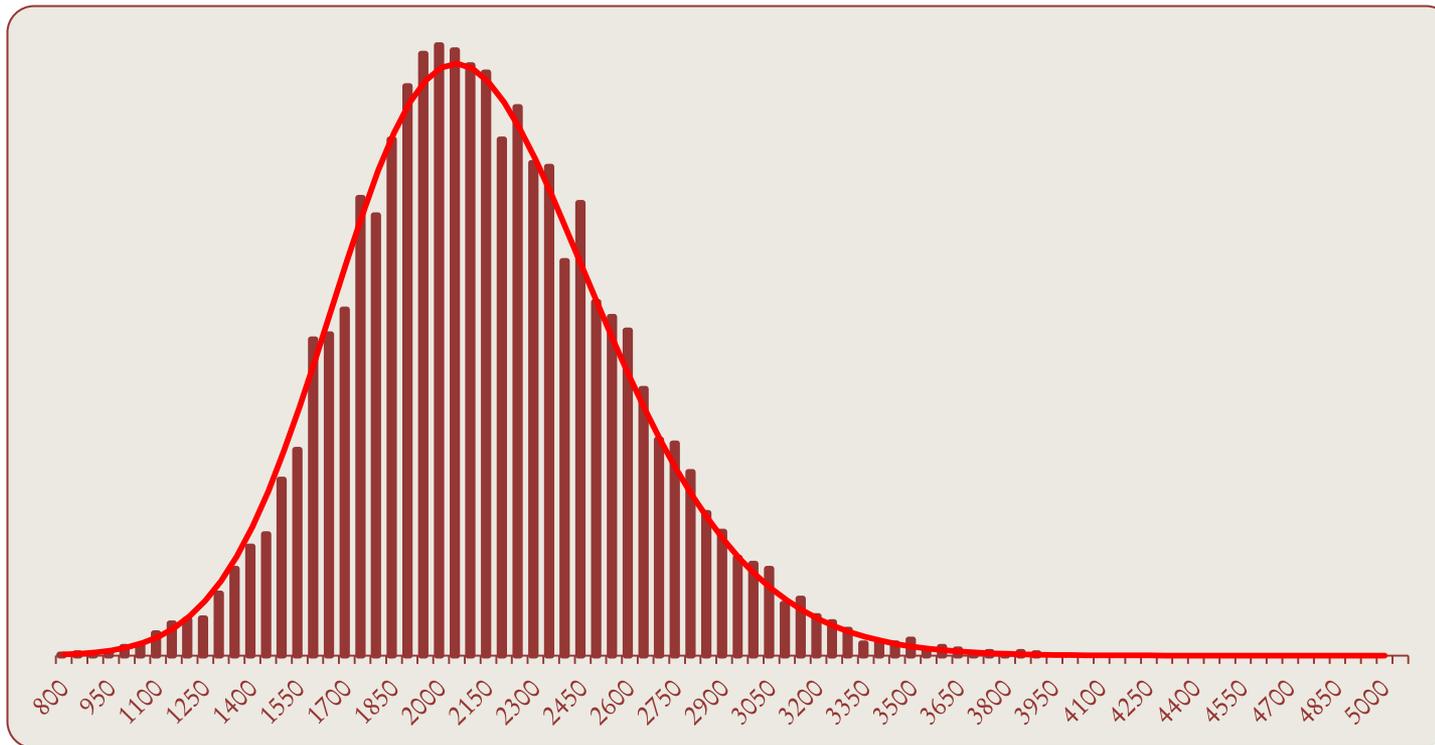
The 2011-12 revision: model

Improved functional form for the distribution of habitual food consumption (data permitting): more flexibility to capture changes in skewness
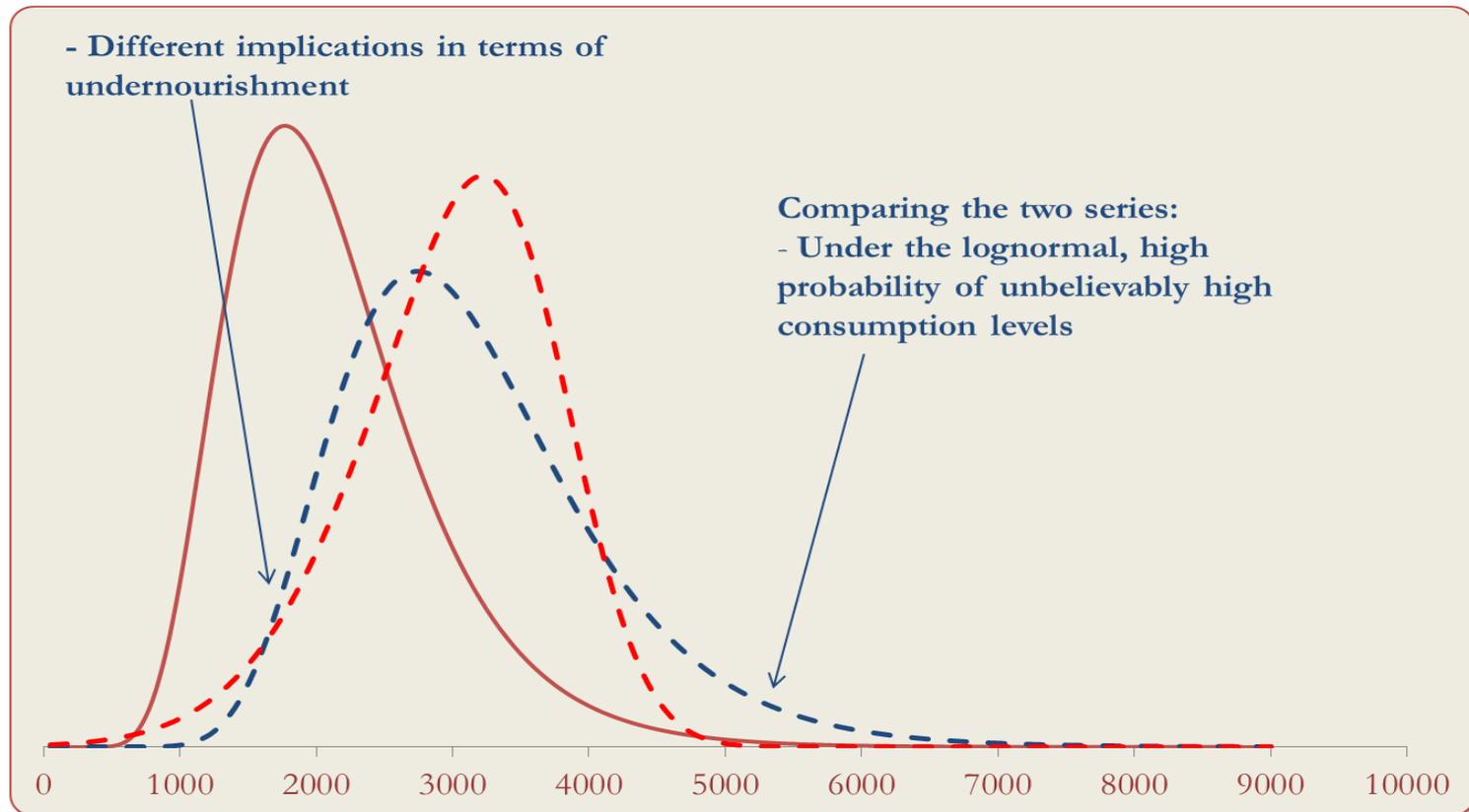
The 2011-12 revision: model

Better assessment of variability in food consumption of household surveys: "pseudo" panel to estimate variability

The 2011-12 revision: model

- Coefficient of variation as the sum of two components: income and other reasons (requirements, others)
- Coefficient of variation corrected for excess variability: only due to income

$$CV(x) = \sqrt{CV^2(x\,|\,v) + CV^2(x\,|\,r)}$$

variation according to levels of income

variation due to requirements and other factors

The 2011-12 revision: data

- *Food supply*: revision of food balance sheets, including losses at retail

- *UN Population assessment 2012*: wide changes (eg China, Bangladesh, Pakistan)

- *Height:* Revised dataset using DHS and other surveys

- *More household surveys*: micro data from more than 45 surveys processed to obtain estimates of distribution parameters (31 countries, more than 70% of the undernourished population)

Further steps

- Better data on food losses: thus far based on results of regional survey

- More from household surveys: need access to micro data

- Better data on food composition (nutrients and energy)

- Improving indirect methods for parameter estimation

- Linking CV and Skewness of food consumption to country characteristic, eg food prices, income and its distribution, other development indicators

PoU methodology is often misunderstood

especially in its statistical foundations:

"Why assuming a parametric distribution for food consumption? It imposes ad hoc restrictions and it is not needed for a headcount approach. Why not simply refer to the empirical distribution of a sample?" [examples: Smith 1999; IFPRI, 2006]

"How is it possible to use a single threshold that is valid for all individuals in the sample, and why setting it at the minimum rather that the average of the possible ranges of requirements? Classification errors will be obvious, and impossible to control." [examples: Anand and Harris, 1992; Svedberg, 1999]

"The MDER is based on a sedentary lifestyle, but not all people in a country are engaged in a sedentary lifestyle, so this must necessarily be an underestimate." [examples: SOFI 2012 (sic!); Lappé et al. 2013]

Conclusions and recommendations

More efforts required to improve our capacity to monitor food security, in comparable ways.

Need to:

- Increase opportunities for compare data required for assessing food security: micro data from hh surveys, and collaboration the national agencies to identify issues (unit of measurements, nutrient content, food away from home)

- Promote countries' collaboration with international initiatives, to harmonize standards and tools: eg the International Household Survey Network (IHSN)

Thank you

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