FAO Undernourishment Indicator: Strengths & Weaknesses

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Methodology is Based on Three Key Components (Parameters)

- Average calories available per capita based on national food balance sheet data – DES:

  Dietary energy supply per capita
- The distribution of calorie consumption assumes a log-normal function & CV derived from household surveys.
- An average minimum calorie requirement, which sets the cut-off point on the distribution for undernourishment.

Strengths

- Serves as an important “annual” benchmark against which progress towards reducing hunger, or lack thereof, can be gauged.
- Assumes it has the trend right.
- Able to monitor food insecurity at the global, regional, and national levels.
- Same methodology can be used for all countries.
- The FAO estimate is widely cited and when released each fall receives widespread media coverage.

Weaknesses

- The approach obviously relies on the accuracy of the three major components.
- Food Balance sheet data are the foundation.
- Only calories are accounted for and other nutritional deficiencies disregarded.
- Seasonal variations

Key Sources & References

- FAO International Scientific Symposium, "Measurement & Assessment of Food Deprivation & Undernutrition", Rome, June 26-28, 2002.

- Hartwig de Haen, Stephan Klasen, and Matin Qaim, "What do we really know? --- Metrics for food insecurity & malnutrition", paper prepared for the NAS Food Insecurity Workshop, Washington, DC , Feb. 16-17,2011.

Lisa Smith

- "Can FAO's measure of chronic undernourishment be strengthened?", *Food Policy* 23/5: 425-445, 1998.
- FAO's measure largely reflects national food availability.
- Shows that the proportion of undernourished is not very sensitive to different CV's in a simulation.
- Promotes use of national household survey data to measure chronic undernourishment.
- When not available, use national socio-economic data and extrapolation techniques to derive an estimate.

Peter Svedberg

- "841 million undernourished?", *World Development* 27/12: 2081-2098, 1999.
- "Fallacies in – and ways of improving – the FAO methodology for estimating prevalence of undernutrition", FAO Symposium June 2002.
- Criticizes the use of a single cut-off point for calorie requirements.
- Questions whether CV used by FAO reflects a plausible distribution of calorie access and requirements.

Svedberg concludes

- Calorie requirements & calorie intake across households are “jointly distributed”.
- The FAO model induces an underestimate, whereas the values of the parameters actually used by FAO lead to an overestimate.
- “FAO faces an enormous challenge to improve its dataset (the data used to estimate chronic undernourishment)”, which yield the key parameters.

Food Balance Sheets: Source of the DES

- Food Balance Sheets: also referred to as food disappearance or food availability data.
- Start with an estimate of annual production by crop.
- Based on estimates of area harvested (acres or hectares) and yield from “field men”. (Norway vs. Congo)
- Supply (by crop) = production + imports + beginning stocks – exports.
- Disappearance must then equal/balance supply.

Food Balance Sheets (continued)

- Disappearance = seed and feed use + ending stocks + government purchases (military, etc.) + residual
- Residual that “balances” supply and disappearance or utilization and is assumed to have been “consumed”.
- “Consumed” not really accurate. For U.S, an estimate of what’s available at the retail level for consumption.
- The aggregate availability is divided by national population estimate to get the per capita availability.

Food Balance Sheets (continued)

- The calories across all crops and animals can then be summed to get the total “DES” per capita estimate.
- PLEASE NOTICE HOW MANY TIMES “ESTIMATE” WAS USED.
- “Conversion Factors” convert the crop supply at farmgate into what’s available as retail-level food products.
- It accounts for losses during transportation, storage, and processing.

Conversion Factors

- For example, 0.76 is the U.S. factor for converting beef carcasses to retail beef availability and 0.689 for boneless.
- In other words, 76% of a beef carcass is assumed to end up at the retail level, and 68.9% if leaving out bones.
- It can be very complicated.
- For example, wheat (grain) is converted into dozens (hundreds) of food products that are consumed.

Conversion Factors

- Served as the Principal Investigator for a project with USDA to update U.S. conversion factors.
- Presumably transportation & processing are more efficient, but retail quality standards are higher.
- We visited dozens of packing and processing plants, and interviewed scores of industry personnel.
- Were in a field in Calif. at 6:00am as celery was picked and packed directly in plastic retail sleeves and boxed for direct shipment to retailers.

Conversion Factors

- Was very difficult to get industry cooperation.
- Information is considered proprietary in many cases.
- How efficient a slaughter house is at converting cattle to retail meat is not something you want competitors to know.
- We usually needed a “contact” to get “in the door”.
- Got the most accurate information we could; but how good was it???

Consumer-Level Food Losses

- Mary Muth et al., “Consumer-Level Food Loss Estimates…”, Tech. Bulletin 1927, ERS, USDA, Jan. 2011.
- Estimates for “cooking loss and uneaten food”.
- Compare dietary intake data (24 hour recall NHANES) and food purchase data (Homescan).
- Using the new loss estimates the average American consumes 41.9 fewer calories per day.
- NOT CLEAR HOW FAO CONVERTS CROP/ANIMAL SUPPLY INTO FOOD CONSUMED (DES) per capita.

Conclusion

- HOW SOUND A FOUNDATION ARE FOOD BALANCE SHEET DATA FOR DERIVING FAO'S UNDERNOURISMENT ESTIMATES???????