



# The impact of household food consumption data collection methods on poverty and inequality measures in Niger



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## 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 leads to differences in poverty and inequality measures even when alternate poverty lines are used.

## 1. Introduction

Many countries have used different methods of collecting data to measure poverty, and each of these methods can influence computed poverty levels. Thus, when comparing poverty indicators over time, it is sometimes unclear whether poverty measurements differ because of differences in the well-being of the population or because of differences in the survey design methods used.

Most countries use either income or consumption expenditure as indicators of monetary poverty; each indicator has advantages and disadvantages as a measure of living standards. Income shows the real flow of resources to a household at a particular point in time, and the ability to assign diverse sources of income to individual members of the household can allow for some analysis of intra-household inequality. However, income is very difficult to measure in developing economies, where most of the active population derives income from agriculture and other non-agricultural, self-employed activities, which are rarely documented. Moreover, income can fluctuate from year to year due to shocks, particularly in rural agricultural societies. Consumption, on the other hand, is smoother and less variable than income and is a more robust method of ranking households (Deaton and Zaidi, 2002). Thus, consumption (food and non-food), has been the standard variable by which to measure monetary poverty in much of the developing world.

Food consumption is a key component of welfare measure. As such, a great deal of research has been devoted to the analysis of methods of collecting food consumption data and their potential flaws. Methods can differ in terms of approach (diary or recall), reference period used, and food items considered (in the case of recall). Each of these elements affects the perceived distribution of expenditure, and, therefore, computed poverty levels (Beegle et al., 2012; Lanjouw and Lanjouw, 2001; Tarozzi, 2007).

Using Niger as a case study, this paper highlights some of the difficulties involved in generating comparable poverty indicators when there are differences in food consumption data collection methods. In 2005 and 2007/08, the National Institute of Statistics (INS) of Niger implemented two national household surveys that have been used to measure and monitor poverty and assess the impact of public policies on the poor. The 2005 survey, the Core Welfare Indicator Questionnaire (QUIBB), collected food consumption information via the “usual month” method for a comprehensive list of food items. The usual month method consists of ascertaining the usual monthly expenditure for each item and the number of months the item was consumed in the past 12 months. The 2007/08 survey, the National Household Income and Expenditure Survey (ENBC), collected food consumption information via a “7-day diary” method. The “7-day diary” method consists in theory of a self-administered instrument in

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which households are asked to register all the food consumed by the members as the food is being consumed. As explained later in the paper, the context of Niger imposed practical adaptations to this method. In 2011, the INS decided to institute a third survey, to be used as a baseline for future poverty monitoring. The National Survey of Household Living Conditions and Agriculture (ECVMA), based on Living Standards Measurement Study (LSMS) surveys, was coordinated with Niger's National Strategy for the Development of Statistics to support a new round of poverty estimates. The data collection method used for the ECVMA was the "7-day recall" approach, which consists of ascertaining the monthly quantity and expenditure of food items consumed in the past 7 days. The original idea was to use the same "7-day diary" method used in the ENBC to better compare poverty indicators between the two surveys, but this was not possible due to logistical, cost, and efficiency reasons. Thus, the 7-day recall approach was chosen because the methodology was close to that of the 7-day diary method, and it was assumed that it would produce more comparable results than if the usual month approach was used.

In and of themselves, none of the above methods for collecting food consumption data are incorrect. However, the literature makes clear that the design of the questionnaire can influence the data collected (see Section 2). Thus, when comparing poverty indicators over time, it is uncertain whether poverty measurements differ because of differences in the well-being of the population or because of differences in the methods used. A comparison of the three survey methods used in Niger in a randomized control setting seeks to help answer to this conundrum.

This paper discusses the results of a food consumption experiment conducted as part of the pilot survey of the 2011 ECVMA. The objective of the experiment was to assess the extent to which the differences in poverty indicators in Niger could be attributed to differences in the three different consumption data collection methods used. Specifically, the experiment replicated the methods of food consumption data collection used in the ECVMA (7-day recall), the QUIBB (usual month), and the ENBC (7-day diary) to see how they impacted poverty measures.

We find 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. The annual per capita consumption from the 7-day recall method was, on average, 28 percent higher than that from the 7-day diary. Obviously, these differences lead to differences in poverty figures, and any analysis of poverty trends using different survey methods that does not correct for changes in method may lead to errors.

The rest of the paper is organized as follows: Section 2 presents a literature review; Section 3 provides a description of the data, including the way the experiment was implemented; and Section 4 explores the impact of the data collection method used on the perceived distribution of economic welfare during the period reviewed and discusses the consequences on poverty and inequality. Section 5 concludes.

## 2. Survey design and consumption data: A literature review

Measurement issues are at the heart of data collection. Regardless of the information being collected—employment, income, expenditures, mortality, etc.—the way that the data are collected matters for the use of those data. Known measurement issues include the level at which the data are collected (individual or household), the period of the year in which data are collected (employment and some other variables are affected by seasonality), and the person providing the information (the individual or a proxy respondent).

In the case of welfare measurement, there has been an ongoing debate over the best method of collecting expenditure information since the inception of the Living Standards Measurement Study (LSMS)<sup>1</sup>

program in the early 1980s (Saunders and Grootaert, 1980). Expenditure data (and particularly food expenditure data) can be collected using either diary or recall methods. Each of these survey designs presents specific challenges. With the diary approach, a recording period must be established (a week, a month, or longer). With the recall method, a list of items and the recall period must be determined. For both methods, the time of year when the data collection occurs can be an issue, unless data are collected all year long.

The diary method, if properly implemented, can yield results closest to actual levels of household food consumption. In theory, diaries are meant to collect data on a daily basis, and are considered most accurate for overall household consumption. In practical terms, however, there are important design decisions that must be made. First, there needs to be a respondent in the household who is literate and can record the entries in the diary. If no one in the household is literate, the interviewers must assist in compiling the diary, spending more time helping household members, which blurs the line between a diary and a recall survey (Beegle et al., 2012; Deaton and Grosh, 2000). Second, diaries must be left with the household and picked up after the recording period is completed. This poses logistical problems for the interview teams, who must ensure that someone collects the diaries and sends them for processing. Third, the use of a diary alters procedures for interviewing. It reduces the amount of time that the interviewer spends interviewing the household, but may increase the amount of time that the interviewer spends traveling since an additional trip must be made to the household to pick up the diaries.

In testing the accuracy of data collected from diaries, several studies analyzed changes in recording over time. (McWhinney and Champion, 1974) observed higher first-week expenditures in Canada; first-week expenditures averaged 8.3 percent above second-week expenditures, and that has come to be accepted as a fact of life in record-keeping surveys. (Wiseman et al., 2005) showed that two-week diaries provide satisfactory estimates for food consumed at home, but are deficient in records of food consumed outside of the home. In addition, missing or unclear data may be difficult to resolve. If researchers must go back to clarify entries with respondents, the data soon become retrospective and subject to recall biases.

Using the recall method for collecting consumption module in Living Standards Measurement Study (LSMS) surveys is a common practice. There are known difficulties with recall periods. For example, (Gibson, 2002) showed that recall methods have measurement errors that are correlated with household size. As household size increases, it becomes harder for survey respondents to accurately recall expenditures on food. A key parameter when designing a recall module is the period as it affects the perceived distribution of consumption. The choice of the ideal recall period is among the most important and difficult design issues for the consumption module.

Longer recall periods are better than shorter ones for measuring the distribution of consumption because averaging consumption over many days eliminates the randomness of some of the household's day-to-day purchases that have nothing to do with its standard of living (Deaton and Grosh, 2000). However, people find it harder to remember more distant events; longer reporting periods lead to more forgetfulness for common purchases like food (Deaton, 2001). It is a well-accepted assumption that the longer the recall period, the greater the likelihood of recall errors, but the longer the recall period, the more possible it is to cover a larger sample of transactions for a given number of interviews, and therefore for a given field cost (Scott and Amenuvegbe, 1990).

Shorter recall periods may help respondents report more accurate information, but there is also the problem of "telescoping," in which respondents report events that lie outside the reference period. With telescoping, the more frequent the event, the greater the likelihood of confusion about dates (Bradburn, 2010). This means that frequently purchased items may be recorded in a recall interview even if not purchased during the specific recall period. The recall period that yields the greatest accuracy will vary with the nature of the goods (Friedman

<sup>1</sup> For more information on the LSMS program, visit [www.worldbank.org/lsm](http://www.worldbank.org/lsm).

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