



BOLIVIA FOOD SECURITY PROGRAM

Experiences from a Maternal Child Health and Nutrition LQAS Survey

SHORT OVERVIEW AND LESSONS LEARNED

Introduction

In January 2006 Save the Children in Bolivia (SCB) conducted a Lot Quality Assurance Sampling (LQAS) survey to assess the impact of the maternal-child health and nutrition (MCHN) component of its USAID funded Title II food security program by measuring caregiver knowledge and the adoption of key practices. The survey was divided into four key areas: (a) Prenatal Care, (b) Breastfeeding and Complimentary Feeding, (c) Diarrhea and (d) Hygiene practices.

The purpose of this technical note is to summarize SCB's experience with the LQAS survey methodology within field-based program implementation. It is not intended to be a primer on LQAS.

The SCB food security program, 'Integrated Initiative for Food Security (IISA),' covers some of the most food insecure areas within the Department of La Paz. The total population of the catchment area is 56,865. In the rural areas of Bolivia, 81.7% of the population is below the poverty line. Chronic malnutrition of children under 5 years is 37.8%.

Objective

Results from the January 2006 LQAS survey are compared with results from the SCB Baseline Survey, conducted in 2002. The time span between these surveys provides a window into the impact of SCB's maternal-child health and nutrition program.

Why Use LQAS?

The LQAS survey methodology was chosen to assess the progress of the MCHN program primarily because it uses a smaller overall sample size than traditional sampling frames but yields comparable results. Thus, depending on population spread, it may be less expensive compared to traditional sampling frames while providing comparable estimates, and additionally allows for disaggregation by supervision area. As it is relatively easy to implement and offers quick results, it can be applied multiple times throughout a project cycle for monitoring purposes.

A sample size of 19 per lot is most commonly used in the LQAS methodology because of its efficiency and statistical accuracy. Sample sizes of more than 19 are not more statistically precise, and sample sizes of less than 19 are not precise enough. A sample size of 19 will correctly identify whether a coverage benchmark has been met for each indicator more than 90% of the time (MkNelly 2001)¹.

¹ MkNelly, Barbara and Valadez, Joseph. Considering the Applicability of Lot Quality Assurance Sampling (LQAS) to Credit with Education Progress Tracking. July 2001.



children with diarrhea per lot (8 x 12 = 96).

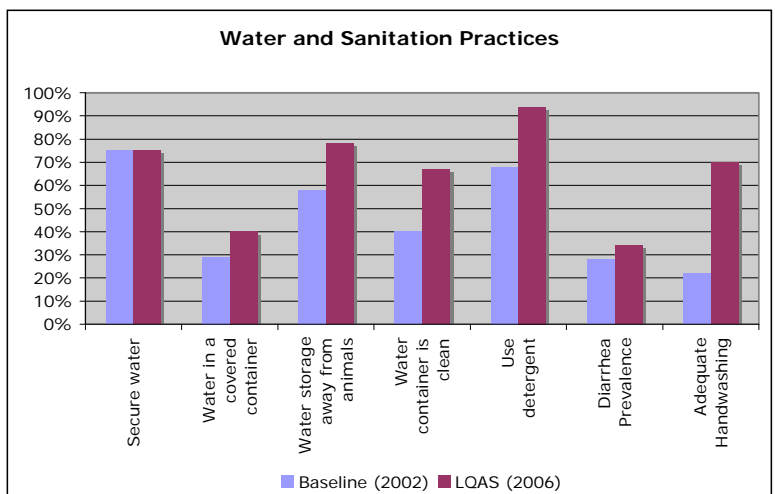
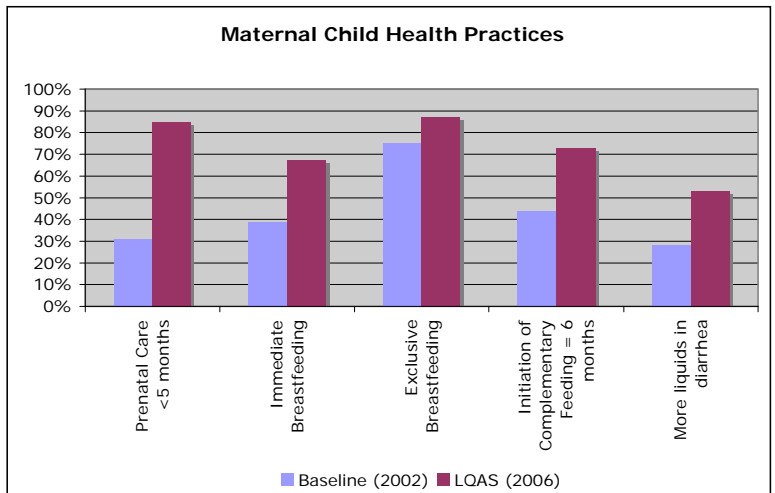
Methodology

In the January 2006 survey, the project's area of intervention was separated into 12 lots, according to supervision areas. To reduce the bias that may have occurred with self-assessment, the community supervisors (SC staff) were assigned to lots outside their usual supervision areas. They interviewed 19 mothers or caretakers of children under one year of age per lot. Each supervisor conducted approximately four interviews per day, and the survey was completed within ten days. The households were randomly chosen from the census of households with children under 3 years of age. If a family was unavailable for interview, another randomly chosen family within the same community was interviewed.

In households with more than one child within the age range, only the youngest child was included. The survey included 228 children less than one year of age, and an additional 78 children with diarrhea under the age of five years. The average age of mothers surveyed was 29.

SCB intended to evaluate appropriate home practices of diarrhea management. The original 19 respondents per lot did not yield enough cases of diarrhea to meet the minimum recommended respondents of 96 (for a desired confidence interval of 10%). Therefore SCB identified additional families with cases of diarrhea in children under 5, thus obtaining a total of eight cases of

Results



Discussion

In SCB's experience, LQAS yielded appropriate results for the majority of key maternal-child health behavior indicators.



Indicators Suitable for LQAS Standard Sample Size of 19	Indicators Requiring Over-Sampling*
Attendance to Prenatal Care	Exclusive Breastfeeding (0-6 months)
Immediate Breastfeeding	Complementary Feeding Practices (6-8 months, 9-11 months)
Access to Secure Water	Diarrhea Management Practices (only children with cases count)
Secure Water Storage and management practices	
Hand-washing and Hygiene Behaviors	*Indicators only sampled a sub-set of the survey population

However, there are a few challenges in using the LQAS method in program monitoring, discussed below:

1. LQAS applies only to dichotomic variables

A key challenge in using an LQAS survey to assess health and nutrition practices is that all questions must fit into a dichotomic, or yes/no, format, and this limits the type of information (indicators) that can be measured. In assessing behavior changes, dichotomic questions are effective in identifying whether a specific behavior has been adopted or not. But for other indicators, such as assessing nutrition status, the 'black and white' categorization of LQAS will fall short.

2. LQAS may fall short for sub-samples

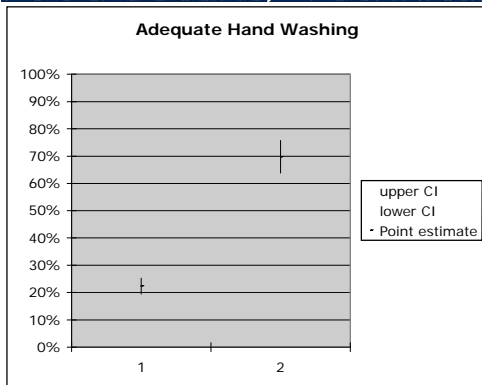
Some indicators will require more in depth investigation than others. One example is the complementary feeding indicator, when all mothers were asked a 24-hour recall on the food type and quantity given to children between 6-11 months. The survey staff experienced one specific challenge to evaluating the quantity of food, as mothers recalled food given in the previous 24 hours in different terms, some using cups as measurements, others using spoonfuls of different sizes.

The LQAS methodology utilizes a limited survey population. If certain indicators apply only to sub-groups, sample sizes may be too small to be representative of the local reality. This occurred in SCB's survey for feeding practices of children in disaggregated age groups, including exclusively breastfed children 0-6 months, and complementary feeding for children between the ages of 6-8 months and 9-11 months. Only 79 mothers responded on exclusive breastfeeding questions, less than the required 96 minimum respondents per indicator. As diarrhea only occurred in 41 cases out of the originally interviewed 228, 78 additional children with diarrhea were added to the survey to effectively reach the minimum sample size.

The limits of the small survey population are best demonstrated by a look at the following graphs, showing survey results for two indicators and their confidence intervals.

In the first case, for adequate hand washing behaviors (228 interviewed), the sample size is sufficiently large enough to show a statistically significant change from the Baseline 2002 survey to the LQAS 2006 survey.

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In the second case, the exclusive breastfeeding indicator deals with a sub-population (79 interviewed) and therefore the confidence intervals from the Baseline 2002 and the LQAS 2006 surveys overlap at 80%, leading to the inability to prove a statistically significant improvement.



3. If the overall coverage is low, lot differentiation becomes invalid

LQAS has the advantage of giving a valid estimate of an overall coverage as well as allowing for comparisons between different geographical units, called lots².

² This differentiation is not recommended when performing traditional random sampling frames. The comparison of lots is based on two steps: 1) calculating an “expected number of cases” out of the 19 respondents, if the overall coverage for the entire area were true for each lot, 2) then establishing whether a particular lot achieved to be within

When analyzing results as either above or below the accepted coverage rate, there are some difficulties. For example, if the overall average is extremely low, then the expected number of cases for each lot becomes 0. As none of the lots can be below 0, each of the 12 lots receives a “green”, or adequate coverage conclusion for this indicator. This gives false feedback to field staff. In SCB’s LQAS, this occurred for adequate feeding practices for children 9-11 months (number of mothers declaring 10+ spoonfuls of food at each meal).

For other indicators, the number of lots that receive a ‘below coverage’ conclusion truly reflects the areas needing more focus, in our case, diarrhea management and hygiene behaviors. For these reasons, LQAS is mainly used as a process-oriented monitoring survey.

Indicators where more than half the lots achieved an acceptable coverage rate include: attendance to prenatal care, immediate breastfeeding, exclusive breastfeeding, complementary feeding, frequency of feedings, increased liquids during a diarrhea episode, increased food after a diarrhea episode, homemade preparations for rehydration, safe water, clean storage of water, and hand-washing practices.

4. Differences between lots may not always be attributable to program or staff efforts

Differences between lots need explanation to uncover the “why” behind which practices were being adopted or not adopted in each

or above the standard as opposed to below the standard. Lots that achieved the standard were marked “green” in the analysis, whereas lots below the standard were marked “red”. However, lot differentiation should only be completed if the indicator has the 19 required respondents.



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program area. For example, certain regions may not have secure access to water, and therefore indicators for hygiene behaviors may be lower. In the valley communities, fruit and vegetables are grown more easily and therefore the content of the diet changes accordingly. However, in Altiplano communities, with its wide, open spaces, animals are raised more frequently and subsequently access to meat and milk may increase. Results cannot only be attributed to the strengths and weaknesses of a particular health promoter, but also to the limitations and advantages of the communities they work in. In assessing the results from any survey, the SCB team has to interpret the results. Additionally in LQAS the differences between lots need cautious interpretation.

Conclusion

LQAS is a valid method to assess knowledge and adoption of promoted practices as well as coverage. The sample size can be much smaller and then the survey is less expensive and time consuming than traditional random sampling methods. LQAS sampling has the additional advantage of providing specific information to supervisors on each supervision area, compared to the overall achievement of each indicator. LQAS can be useful in helping an organization allocate resources to suit regional needs.

However, LQAS has several caveats:

- First, it will only apply to dichotomic variables (not recommended for continuous variables such as nutritional status).

- Second, it will fail for sub samples (similar to the way traditional random sampling may fail).
- Third, if the overall coverage is very low, lot differentiation becomes invalid.
- Lastly, differences between lots may not always be attributable to program or staff efforts.

SCB recommends using LQAS to monitor the MCHN component of food security programs taking into account the limitations discussed above.