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Original Research Article

Infant and young child feeding practices in two provinces of Afghanistan: results from two rounds of large country-lot quality assurance sampling surveys

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ABSTRACT

Background: As per NNS 2013, about 58% of the infants aged 0-5 months were exclusively breastfed. The data also shows that only 41% infants 6-8 months of age were introduced solid, semi-solid and soft foods. Further only 28% of children aged 6-23 months received foods from four or more food groups during last 24 hours preceding the survey. Suboptimal IYCF practices are therefore considered to be an important contributor to the high rates of under nutrition in Afghanistan. The program monitoring at two time points was conducted to inform the program about the current status of the program activities and any course correction required. It was also meant to inform the government and other stakeholders on the feasibility of program strategies in improving IYCF practices and recommendations for scale-up programs.
Methods: The program monitoring was performed before and after the (IYCN) program roll out in Wardak and Laghman provinces of Afghanistan. To understand and monitor the status of process and program indicators, a Large Country-Lot Quality Assurance Sampling (LC-LQAS) study design was adopted.
Results: Minimum acceptable diet was observed to be 54% (95% CI: 46%, 61%) in the second round, which was 44% (95% CI: 35%, 53%) in the first round.
Conclusions: Minimum acceptable diet among the children of age group 6-23 months was found to be consistently doing well in both the rounds. LC-LQAS was found to be an apt method to estimate the IYCN indicators at time points with low resource use.

Keywords: LC-LQAS, Infant and young child feeding, Wardak, Laghman, Afghanistan

INTRODUCTION

Levels of malnutrition in Afghanistan have declined over time but remain unacceptably high. Stunting in children of age 0-59 months has reduced from 60.5% in 2004 to 40.9% in 2013, and percent of underweight children has reduced from 33.7% to 24.6%.[1,2] Wasting has stagnated, 9.5% in 2013 compared to 8.7% in 2004. Prevalence of anemia (Hb<11.0 g/dL) among children of age 6-59 months has increased from 38% in 2004 to 43% in 2013.

Suboptimal infant and young child feeding (IYCF) practices are an important contributor to the high rates of under nutrition. As per Afghanistan Demographic and Health Survey (DHS, 2015), only 43% of the infants under 6 months of age were exclusively breastfed. 24% of the children 6 to 23 months consumed an adequately diverse diet—that is, they had been given foods from the appropriate number of food groups and 51% had been fed the minimum number of times appropriate for their age. The minimum standards with respect to all three IYCF feeding practices were met for only 16% of children age 6-23 months.[3]

The micronutrient initiative (MI) now known as Nutrition International (NI), supported the Public Nutrition Directorate (PND), Ministry of Public Health (MoPH), Afghanistan to demonstrate a program model for prevention of child undernutrition through focus on capacity building of both health facility staff and community health workers (CHWs) for counselling on appropriate IYCF practices and it's monitoring and tracking in Wardak and Laghman provinces.

Program model and implementation

The program aimed to demonstrate prevention of undernutrition through focus on appropriate IYCF practices and use of multiple micronutrient powders (MNPs) for children 6-23 months. The program was designed to be delivered through health facilities and health posts and home visits by Community Health Workers (CHWs). NI partnered with the Swedish Committee for Afghanistan (SCA), as the implementing NGO partner, to implement the program.

The intervention package focused on:

- Early initiation of breastfeeding within one hour after hour and exclusive breastfeeding for children 0 to 5 months of age.
- Timely and appropriate complementary feeding for children 6-23 months:
    - Initiate complementary feeding after 6 months of age.
    - Feed a variety of foods.
    - Feed 2 bowls of complementary food to a child 7 to 8 months, 3 bowls to a child 9 to 11 months and 4 to 5 bowls to a child 12 to 24 months, every day.
- Provision of MNPs to children 6-23 month children to improve quality of complementary foods and prevent anemia. MNPs were distributed in two rounds at an interval of 4 months (60 sachets/child/round) i.e. 30 sachets per month, to be consumed one per day along with the complementary food.

The program approach included:

- Capacity building of health facility staff and CHWs on adequate knowledge and skills on IYCF practices.
- Counselling on IYCF practices and growth promotion at health facilities and health posts and referral of children with severe acute malnutrition (SAM) and medical complications to institutional care as per the guidelines.
- Utilizing group meetings and home visits by CHWs for reinforcement of feeding messages and problem solving.
- Use of simple communication materials for counselling.

The key program activities included: (i) printing and distribution of Dari and Pashto versions of MoPH nutrition training guidelines to all health facilities; (ii) capacity building of 372 health staff and 958 CHWs on the new MoPH standard operating procedures which focusses on IYCF, growth monitoring and promotion, management of SAM, maternal nutrition and food based dietary guideline; (iii) development, printing and distribution of communication materials including flip-charts and small books; (iv) procurement of 6.25 million sachets of MNPs through UNICEF and its distribution; and (v) regular monitoring and supportive supervision visits by the implementing partner SCA, provincial nutrition officer and the NI program officers.

METHODS

As part of monitoring at two time points before and after the program roll out to understand and monitor the status of process and program indicators, a Large Country-Lot Quality Assurance Sampling (LC-LQAS) study design was adopted.[4] This method has the advantage of providing weighted point estimates for the two provinces as well as identifying focus areas where performance is poor based on a predetermined and agreed upon decision rule. LQAS was originally developed in the 1920s to control the quality of industrially produced goods (Dodge and Romig 1959).[5] The LC-LQAS is a method that combines LC-LQAS and cluster sampling to help arrive at estimates at the broader catchment area with population weighted confidence intervals. The target group of respondents were caregivers of children 6-23 months of age and health workers.

Study design

In this LC-LQAS method of sample survey, the eligible survey respondents were sampled from supervision areas (SA) nested in a larger catchment area. Being a health intervention, the geographical area covered by health facilities seem to be a natural supervision area, considering the level of implementation, while the province is the catchment area, to which the health facilities belong to. Each health facility served a population size of ~10,000-10,500 on average (or ~1,700-

1,750 households considering an average family size of 6). In the two program provinces of Wardak and Laghman, the population covered by these health facilities are considered as the supervision areas (SAs). Thus, 58 and 43 health facilities were considered in Wardak and Laghman provinces, respectively (for which catchment area population figures are available). There are in all about 59 and 47 health facilities in Wardak and Laghman provinces, respectively (one in Wardak and in four in Laghman do not have population figures available).

Sample size

Using the LC-LQAS sample size formula, the required sample size of number of required SAs was computed to be 15 each in Wardak and Laghman. The sample size was computed using the following formula:

$$n = N(1 + (m-1)\hat{\rho}\left\{\left[\left(\frac{l_{max}N^{*}_{cen}}{1.96}\right)^{2}\left(\frac{(m-1)(1-\hat{\rho})}{N\overline{M}^{2}}\right) + m\hat{\rho}\right]\right\}^{-1}$$

- Where, N= total number of supervision areas (SA) in the province
- m= 19 (the number of interviews to be conducted in a SA)
- P= Intra-class Correlation Coefficient =0.061
- *lmax*= the maximum desired length for the confidence interval, `max', which in this case, has a value of 0.2
- *N*cen* = total population of all the SAs in the catchment area
- M^2= the average of the square of the populations in each SA

The Intra cluster correlation coefficient (ICC) was computed using the following formula:

$$\hat{\rho} = (DE - 1)/(m - 1)$$

- Where: p= Intra-class Correlation Coefficient (ICC)
- DE= Design effect=2.1
- m=19

The Intra cluster correlation coefficient (ICC) was computed to be 0.061. The ICC was computed from the available Afghanistan Mortality Survey 2010, using an average design effect of 2.1 and samples size of number of interviews per supervision area as 19 households with a caregiver of children 6 to 23 months. The same average design effect and ICC for both the provinces was used as IYCN indicator-wise design effects are not available from any nation-wide surveys in Afghanistan.

Thus, the total sample size of caregivers with children in the age group of 6 to 23 months for Wardak and Laghman comes to 570 (15*2 provinces=30 SAs* 19 caregivers per SA=570). In the baseline or 1st round, the required number of 30 SAs were sampled from the total sampling frame of 101 SAs (58 +43=101 health facilities) using simple random sampling (SRS) method (after sorting all the health facilities using random numbers generated using excel). In the selected health facility supervision area, all the villages were listed and the interview locations (villages) (for the interview of 19 households with a caregiver of child 6 to 23 months of age) were selected using probability proportional to size (PPS) method. In the selected village, the sampling of household for the interview was done by dividing the village (a village is usually about 100-150 households) into natural segments of approximately 50-75 households each. One segment was selected randomly from these segments. The selected segment was house listed and households with a caregiver of a child 6 to 23 months of age was identified. One caregiver with a child 6 to 23 months was selected for the interview randomly from this list (using a random number from a random number table) in one village. Similarly, 19 interviews were conducted in the selected 19 villages, one interview per village/ segment in a supervision area. 30 supervisory areas; 15 per province were selected in the baseline assessment. The 2nd round was also conducted in the same 30 supervisory areas. In the 2nd round, similarly, in the each health facility supervision area, all the villages were listed and the interview locations (villages) (for the interview of 19 households with a caregiver of child 6 to 23 months of age) were selected using probability proportional to size (PPS) method. In the selected village, the sampling of household for the interview was carried out by dividing the village (a village is usually about 100-150 households) into natural segments of approximately 50-75 households each. One segment was selected randomly from these segments. The selected segment was house listed and households with a caregiver of child 6 to 23 months of age was identified.

Table 1: Calculation of sample size of the number of supervision areas (SAs) in two selected provinces of Afghanistan.

Province	Population	#SAs	Population squared	ICC	Sample size per SA	Max desired length for CI	#SAs from the formula	# SAs
	N^{*}_{Cen}	N	M^2	P	M	l_{max}	N	n
Wardak	6,03,132	58	15,01,58,866	0.061	19	0.2	14.311	15
Laghman	4,50,654	43	17,19,22,010	0.061	19	0.2	15.062	15

One caregiver with a child aged 6 to 23 months was selected for the interview randomly from this list (using a random number from a random number table) in one village. Similarly, 19 interviews were conducted in the selected 19 villages, one interview per village/ segment in a supervision area. The study location was 15 supervisory areas each in the two program provinces of Wardak and Laghman. Both the rounds of LC-LQAS surveys were conducted administrating a pre tested questionnaire developed using WHO guidelines to collect information on IYCF knowledge and practices.

Table 2: Study provinces and supervisory areas (SAs) in two selected provinces of Afghanistan.

Supervisory area (SA)	Program catchment Area 1, Laghman province	Program catchment area 2, Wardak province
SA 1	Badpash CHC	Jalrez CHC
SA 2	Lokar BHC	Farakhulum CHC
SA 3	Alingar CHC	Kota ashro CHC
SA 4	Dewa BHC	Dasht toop CHC
SA5	Mihtarlam CHC	Raqul CHC
SA6	Alo khail BHC	Seyakhak BHC
SA 7	Azizkhan kas BHC	Sartala BHC
SA 8	Baba sahib BHC	Sayedabad BHC
SA 9	Qarghayi CHC	Bibi khairigul BHC
SA 10	Shamti CHC	Gardan diwar BHC
SA 12	Kachawor salab BHC	Shaikabad BHC
SA 13	Farashghan BHC	Khawja sahib BHC
SA 14	Keshmand BHC	Durani BHC
SA 15	Charbagh CHC	Chak DH

Data collection and analysis

The data collection for LC-LQAS was undertaken during February 2015 and February 2016 at the start and end of the program, respectively, to monitor key process indicators (activities and outputs) as well as the intermediate outcomes (IYCF indicators) to assess the feasibility of the program processes to change IYCF behaviors. The results of these rapid assessments do not claim to attribute change due to the program strategies. However, they were used to understand trends and inform program decision making. Microsoft Excel 2013 was used for all the analyses.

RESULTS

The key findings for IYCF practices in the first and the second round of LC-LQAS surveys are as follows:

Minimum dietary diversity

It is computed as children 6–23 months of age who received foods from ≥4 food groups during the previous day.[6,7] In the first round, the minimum dietary diversity among 6-23 months children (per cent of children 6–23 months of age who receive foods from 4 or more food groups) was found to be 48% (95% CI: 40%-57%) in both the provinces. The corresponding figures for Wardak and Laghman were found to be 54% (95% CI: 40%-68%) and 45% (95% CI: 34%-57%) respectively. In the second round, the minimum dietary diversity among 6-23 months children was found to be 61% (95% CI: 53%-69%) in both the provinces. The corresponding figures for Wardak and Laghman were 72% (95% CI: 64%-79%) and 55% (95% CI: 41%-69%), respectively.

Minimum meal frequency

It is computed as breastfed children 6–23 months of age who received solid, semi-solid or soft foods the minimum number of times or more during the previous day and non-breastfed children 6–23 months of age who received solid, semi-solid or soft foods or milk feeds the minimum number of times or more during the previous day.[6,7]. In the first round, the minimum meal frequency among 6-23 months children (per cent of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more during the previous day) was reported to be 72% (95% CI: 63%-81%) in both the provinces. The corresponding figures for Wardak and Laghman were found to be 73% (95% CI: 61%-86%) and 71% (95% CI: 58%-85%), respectively. In the second round, it was reported to be 78% (95% CI: 73%-84%) in both the provinces. The corresponding figures for Wardak and Laghman were 82% (95% CI: 75%-89%) and 76% (95% CI: 68%-85%), respectively.

Minimum acceptable diet

It is computed as breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day and non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day (minimum is defined as 2 times for breastfed infants 6-8 months, 3 times for breastfed children 9-23 months) and (4 times for non-breastfed children 6-23 months). [6,7] In the first round, the minimum acceptable diet among 6-23 months children (per cent of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk) was found to be 44% (95% CI: 35%-53%) in both the provinces. The corresponding figures for Wardak and Laghman were found to be 51% (95% CI: 36%-65%) and 40% (95% CI: 29%-52%), respectively. In the second round, the minimum acceptable diet among

6-23 months children was found to be 54% (95% CI: 46%-61%) in both the provinces. The corresponding figures for Wardak and Laghman were 63% (95% CI: 55%-71%) and 49% (95% CI: 35%-63%), respectively.

Table 3: Population weighted average estimates with confidence intervals of indicators from two rounds of LC-LQAS surveys in two selected provinces of Afghanistan.

Indicators	Rounds	Wardak	Laghman	Both
		% (95% CI : LL, UL)	% (95% CI : LL, UL)	% (95% CI : LL, UL)
Minimum dietary diversity	Round 1	54 (40, 68)	46 (34, 57)	48 (39, 57)
	Round 2	72 (64,79)	55 (41, 69)	61(53, 69)
Minimum meal frequency	Round 1	73 (61, 86)	71 (58, 85)	72 (63, 81)
	Round 2	82 (74, 89)	76 (68, 85)	78 (73, 84)
Minimum acceptable diet	Round 1	51 (36, 65)	40 (29, 52)	44 (35, 53)
	Round 2	63 (55, 71)	49 (35, 63)	54 (46, 61)
Consumption of iron-rich or iron-fortified foods	Round 1	14 (7, 20)	13 (7, 19)	13 (9,18)
	Round 2	27 (18, 35)	21 (9, 33)	25 (18, 32)

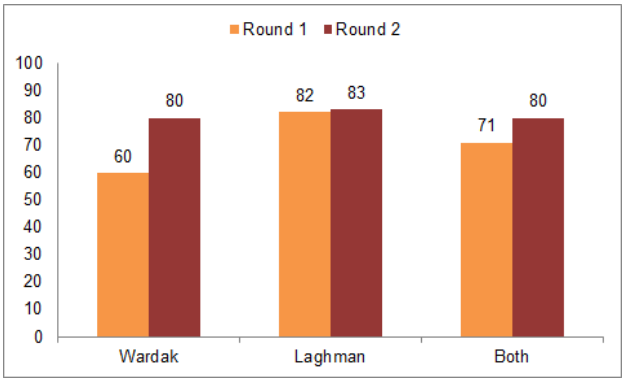

Figure 1: Health workers reporting to have conducted home visits for counseling and problem solving in two rounds of LC-LQAS surveys in two selected provinces of Afghanistan (%).

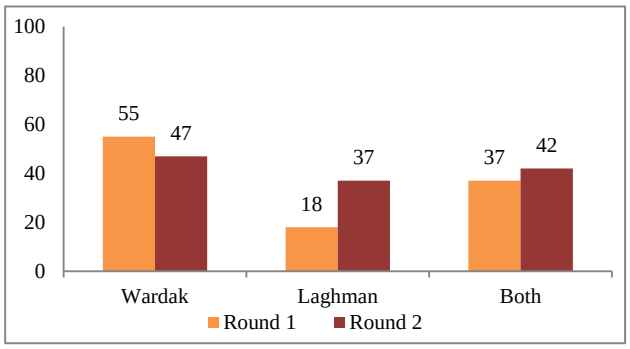

Figure 2: Health Workers who could explain three IYCF in two rounds of LC-LQAS surveys in two selected provinces of Afghanistan (%)

Consumption of iron-rich or iron-fortified foods

It is computed as the children 6–23 months of age who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was fortified in the home with a product that included iron during the previous day. [6,7] In the first round, the consumption of iron-rich or iron-fortified foods by children 6-23 months was found to be 13% (95% CI: 9%-18%) in both the provinces. The corresponding figures for Wardak and Laghman were found to be 14% (95% CI: 7%-20%) and 13% (95% CI: 7%-19%), respectively. In the second round, the consumption of iron-rich or iron-fortified foods by children 6-23 months was found to be 25% (95% CI: 18%-32%) in both the provinces. The corresponding figures for Wardak and Laghman were 27% (95% CI: 18%-35%) and 21% (95% CI: 9%-33%), respectively.

Consumption of multiple micronutrient powders

The program included distribution and promotion of the use of multiple micronutrient powders (MNPs) to be mixed with the complimentary feeds of children aged 6-23 months. During the second round of LC-LQAS, it was found that 27% mothers had acquired knowledge on method of administration, dose and benefits of MNPs compared to 2% in the first round.

Knowledge of health workers

The per cent of health workers who could describe at least three optimal IYCF practices was observed 37% at first round and 42% in the second round in the two provinces. In Wardak, it was found to be 55% in first round and 47% in second round of monitoring. However, for Laghman, it was 18% in first round and 37% in second round respectively.

DISCUSSION

There was an improvement in the IYCF indicators, minimum dietary diversity, minimum acceptable diet and consumption of iron-rich or iron fortified foods during the second LC LQAS as compared to the first round in both the provinces. MNPs were distributed after the first round of LC-LQAS and were not a part of the routine services in Afghanistan. Nearly, 49% of the caregivers reported to have received and fed any MNP sachet to their children in the second round. However, the data

highlights that about 40% to 50% of children 6-23 months are still not being appropriately fed complementary foods which is a significant gap. Thus, is can be said that proper formative studies are required to develop targeted infant and young child feeding messages for pregnant or lactating women to improve upon the IYCF practices. Although, MI's program strategies did not cover counseling of husband and mother in-laws of women on IYCF practices but studies shows that in addition to the lack of knowledge about proper infant and young child feeding practices among Afghan mothers, their decisions about child feeding are heavily influenced by their mothers-in-law, husbands, and other influential extended family members who also are likely not to know about basic nutritional needs or appropriate feeding for newborns and young children.[8-10]

Combined estimates indicate an overall increase in the knowledge of health workers on key IYCF practices from 37% to 42% but individual estimate of Wardak shows a small decline in the knowledge of health workers in second round of survey as compared to first round, data on knowledge of health workers on key IYCF practices indicates the need for proper pictorial aids for training of health workers to support an in increase in their own knowledge as well as enhancing the skills for counseling and problem solving of target groups. An average time for counseling can be determined for home visits of health workers.

Female CHWs are responsible to conduct regular home visits within the catchment area of related Health Post as part of routine public health care system in Afghanistan. As a part of MI's initiative, intensive training was given to health workers and CHWs to increase their knowledge on key IYCF practices to capacitate them so that they can counsel caregivers of children on key IYCF practices for improving nutrition outcomes and this may have attributed to an increase in health workers, who reported to have conducted home visits for counselling and problem solving at 71% and 80% for round one and round two, respectively. Using home visits for interpersonal counseling and problem solving of caregivers on IYCF related practices was one of the key program strategies, and an increase in the home visits by health workers and their enhanced knowledge could have supported improvement in the IYCF practices.

CONCLUSION

The program model demonstrated that the program strategies can improve IYCF practices within a short intervention period. MNPs can be integrated into the IYCF promotion package. A heightened focus on building skills and capacity of health facility staff and CHWs on counselling and problem solving for improved IYCF practices is required. Capacity building of health workers needs to be complemented with strong behavior change activities to promote and support behavior change. Program monitoring should be central to the IYCF programs to monitor and track program results and make course corrections. Support from other sectors such as maternal and child health education, education and women welfare will be required to achieve improvements in nutrition outcomes. The hard to reach and conflict affected zones need to be factored during planning and implementation.

Infant and young child feeding practices are a key determinant of malnutrition in Afghanistan, and there has been relatively little attention given to this issue. However, nutrition recently has become a high priority in Afghanistan. A nutrition action framework has been prepared by five core ministries, including the Ministry of Public Health that implements the Basic Package of Health Services. Improving infant and young child feeding knowledge and practices is a core priority for the Ministry of Public Health and its partners.

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