

**APPLICATION OF LOTS QUALITY ASSURANCE SAMPLING & EVALUATION IN NATIONAL VECTOR BORNE DISEASE CONTROL SUPPORT PROJECT IN NINE DISTRICT OF MADHYA PRADESH, INDIA**J.C. Paliwal<sup>1</sup>, Manoj Paliwal<sup>2</sup>, Prachi Paliwal<sup>3</sup>, K.K. Thassu<sup>4</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT:** Lots Quality Assurance (LQAS) Sampling is a rapid survey used by Vector Borne Disease Officer to determine whether Community Health Centers (CHCs) are reaching pre-established targets for key project indicators. The advantage of LQAS over the usual cluster survey methods is well established. LQAS is established in each project district by utilizing its own dedicated Malaria Technical Supervisors (MTS) to track use of Rapid Diagnostic Tests (RDT) and Artesunate Combination Therapies (ACT), coverage and use of Long Lasting Insecticide Nets (LLIN) and to assess Insecticidal Residual Spray (IRS) coverage at the village level. LQAS analysis is done at the CHC level and it measures key project indicators using focused mini-questionnaires. Modules for use of LQAS include beneficiary interviews, ASHA interviews and observation of the facilities across dimensions including fever management and treatment seeking behavior module, an ITN/LLIN coverage and use module, an ASHA Questionnaire and involvement of MPW in the programme. Nine districts are included in "National Vector Borne Disease Control Support project" in Madhya Pradesh since year 2009. The four rounds of LQAS have been concluded since third quarter of year 2010 to 2011. It is found that, LQAS has increased community awareness regarding diagnostic and treatment facilities of malaria available with ASHA. This paper brings out the analytics vis-à-vis the corrective actions initiated.

**KEY WORDS:** LQAS- Lots Quality Assurance Sampling, VBDC- vector borne disease control, MPW- multipurpose worker, MTS- malaria technical supervisor, RDT- Rapid diagnostic test.

**INTRODUCTION:** LQAS was originally developed in the 1920s to control the quality of output in industrial production processes. It involves taking a small random sample of a manufactured batch (lot) and tests the sampled items for quality. If the number of defective items in the sample exceeds a pre-determined criteria (decision rule), then the lot is rejected. The random sampling methodology is adopted in the process. Random sampling allows using the "few" to describe the "whole" and random sampling is a critical way to improve the ability to generalize in this way (it improves "external validity") LQAS is now used all over the world in community health programs for <sup>1</sup> assessing coverage of key health knowledge and practices in maternal and child health, family planning, and HIV/AIDS; <sup>2</sup> assessing the quality of health worker performance and <sup>3</sup> assessing disease prevalence.

LQAS is a rapid survey used by Vector Borne Disease Officer to determine whether Community Health Centers (CHC) is reaching pre-established targets for key project indicators. LQAS is established in each project district by utilizing its own dedicated Malaria Technical Supervisors (MTS) to track use of Rapid Diagnostic Tests and Artesunate Combination

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Therapies (ACT), coverage and use of Long Lasting Insecticide Nets (LLIN) and to assess IRS coverage at the village level.

**METHDOLOGY:** Modules for use for LQAS are being developed to include beneficiary interviews, ASHA interviews and observation of the facilities. Three modules are currently envisioned: (1a) an ITN/LLIN coverage and use module, (1b) a fever management and treatment seeking behavior module, (2) an ASHA Questionnaire and (3) Involvement of MPW in the programme.

Block (CHC) wise planning of LQAS is ensured. Listing of villages in a block is done considering three domains i) villages where RDT and ACT has been made available, ii) villages which are covered under insecticidal spray, and iii) villages where LLINs are distributed. Amongst such villages only 19 villages are selected by random sampling for LQAS in a block. Sample size of 19 provides an acceptable level of precision for making management decisions; At least 92% of the time, it identifies whether: a coverage benchmark has been reached, or whether a Supervision Area is substantially below the average coverage. The advantage of LQAS over the usual cluster survey methods is well established. LQAS is conducted by Malaria Technical Supervisor in sampled village, where again house is randomly sampled, the methodology<sup>4</sup> used either, birth of a child or marriage in a house is considered as index house and from that house next 10th house is selected as sample house.

The fever management module is applied in the household where the previous mini-questionnaire is used or in subsequent households. It applies only to people who have had a fever in the last 2-weeks. The third mini-questionnaire requires the MTS to contact the frontline service provider ASHA to inspect the condition of ACTs and RDTs, whether stock-outs have occurred in the last 3-months, and whether this provider can use RDTs and treat malaria correctly. In fourth mini-questionnaire MTS has to contact the MPW to judge the involvement of MPW in the programme.

**OBSERVATIONS:** LQAS results were analyzed<sup>5</sup> to measure key project indicators using focused mini-questionnaires. The data collection and preliminary analysis is carried out by MTS. The same data was used to calculate point estimates for outcome indicators at district & state levels. A data for decision – making component was established for determining underlying program problems. The LQAS is being used because it requires minimum amount of information to judge whether outcomes are on track at the CHC level. This is due to its small sample size of 19, Nine districts are included in “National Vector Borne Disease Control Support project” in Madhya Pradesh since year 2009. The four rounds of LQAS has commenced, of which first round in August 2010, second round in March 2011, third round in June-July 2011 and fourth round in November- December 2011 were held. The analysis of LQAS data on 48 indicators was accomplished. Aggregated data analysis of 4 rounds of LQAS on 9 most important indicators reveal gradual improvement in desired achievements shown in table 1 below:

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Important Indicators	LQAS Rounds	Sample Size	Achievements	Percentage Achievements
1. Persons are aware about, local service provider ASHA, providing treatment	1st	988	558	54.58
	2nd	950	587	59.90
	3rd	1254	897	70.80
	4th	855	688	81.10
2. People contact any service provider within one clear day of start of fever	1st	988	598	59.50
	2nd	931	545	59.00
	3rd	1254	751	59.90
	4th	854	539	64.10
3. People get the blood tested within one clear day of start of fever	1st	988	430	43.57
	2nd	931	331	36.10
	3rd	1254	527	43.40
	4th	854	389	47.10
4. Blood test done by the designated local provider	1st	988	328	34.10
	2nd	931	312	35.00
	3rd	1254	356	29.70
	4th	854	251	30.50
5. Treatment for malaria provided by the designated local provider	1st	988	302	30.00
	2nd	931	307	34.20
	3rd	1254	459	35.60
	4th	854	395	49.50
6. Trained provider proficient in conducting RDT	1st	988	814	84.34
	2nd	969	702	72.40
	3rd	1229	907	73.80
	4th	834	703	84.29
7. Trained local provider currently have at least 10 non-expired RD tests in stock	1st	988	478	51.24
	2nd	969	480	49.50
	3rd	1229	586	49.00
	4th	834	289	37.70
8. Trained local provider have enough stock of ACT	1st	988	302	31.85
	2nd	969	547	56.40
	3rd	1229	657	53.70
	4th	834	429	51.44
9. The selected person sleep either in a room sprayed by insecticide in the last 3 months, or under an LLIN or under a bed net	1st	988	315	29.17
	2nd	950	193	20.50
	3rd	1254	172	13.72
	4th	955	237	27.72

**Table -1: Detailed illustration of each round of LQAS with sample size, achievements & percentage achievements**

The results thus generated in LQAS have enabled taking corrective measures to achieve desired goal in the project.

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**RESULT:** Result of LQAS indicate 56 to 81% people are aware about availability of diagnostic and treatment facility with ASHA in their village, 72 to 84% ASHA is proficient in conducting Rapid Diagnostic Test. 31 to 34% Blood test and 30 to 50% treatment is done by ASHA, 38 to 51% ASHA currently have at least 10 non- expired Rapid Diagnostic tests in stock and 32 to 56% ASHA have enough stock of Artesunate Combination Therapy. Thus significant progress is visible as a result of LQAS; some low performing areas are also identified for corrective measures.

**DISCUSSION:** LQAS is beneficial as small sample size is needed. It is simple to apply yet has very specific conclusions. It also provides high quality information at low and affordable cost. Results are locally relevant and can be utilized for block, district level planning and decision-making.

Sample size of 19 is acceptable for setting priorities within a supervision area. Identifying priorities among supervision areas with large differences in coverage, deciding what are the higher performing supervision areas and the lower performing supervision areas in which resources need to be better utilized. Also, identifying knowledge/practices from high coverage areas and applying these in low coverage areas can lead to need based policy decision and corrected implementation plan. At the inception of the project, the local provider ASHA was not much involved in diagnosis and treatment of falciparum malaria cases, but gradually rapid diagnostic kits (RDK) for diagnosis of falciparum malaria and ACT for treatment have been made available to ASHA for early diagnosis and prompt treatment (EDPT) of malaria in community.

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