ICDDRB: Centre for Health & Population Research

RRC APPLICATION FORM

RESEARCH PROTOCOL

Protocol No.: 2001-024

FOR OFFICE USE ONLY

RRC Approval: Yes/ No Date:

ERC Approval: Yes/No Date:

AEEC Approval: Yes/No Date:

Project Title: Rapid Assessment Tool (RAT) for Better Health: Helping Essential Service Package (ESP) Managers to be More Effective

Theme: *(Check all that apply)*

- ☐ Nutrition
- ☐ Emerging and Re-emerging Infectious Diseases
- ☐ Population Dynamics
- ☐ Reproductive Health
- ☐ Vaccine evaluation
- ☐ Environmental Health
- ☑ Health Services – related
- ☐ Child Health
- ☐ Clinical Case Management
- ☐ Social and Behavioural Sciences

Key words: Rapid assessment, Essential service package

Principal Investigator: Abbas Bhuiya **Division:** PHSD **Phone:**

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Co-Principal Investigator(s):

Co-Investigator(s):

1. Dr. P. K. Streatfield, HDSS, ICDDR,B

2. Dr. Ahmed Al Kabir, Urban Family Health Partnership

Student Investigator/Intern: None

Collaborating Institute(s): Urban Family Health Partnership

Population: Inclusion of special groups *(Check all that apply)*:

Gender
- ☐ Male
- ☑ Females

Age
- ☑ 0 – 5 years
- ☐ 5 – 9 years
- ☑ 10 – 19 years
- ☑ 20 +
- ☐ > 65

- ☑ Pregnant Women
- ☐ Fetuses
- ☐ Prisoners
- ☐ Destitutes
- ☐ Service providers
- ☐ Cognitively Impaired
- ☐ CSW
- ☐ Others (specify _____)
- ☐ Animal

Project / study Site *(Check all the apply)*:

- ☐ Dhaka Hospital
- ☐ Matlab Hospital
- ☑ Matlab DSS area
- ☐ Matlab non-DSS area
- ☐ Mirzapur
- ☐ Dhaka Community
- ☐ Chakaria
- ☐ Abhoynagar
- ☐ Mirsarai
- ☐ Patyia
- ☐ Other areas in Bangladesh UFHP Areas
- ☐ Outside Bangladesh
  name of country: _____
- ☐ Multi centre trial
  (Name other countries involved)

Type of Study *(Check all that apply)*:

- ☐ Case Control study
- ☐ Community based trial / intervention
- ☐ Program Project (Umbrella)
- ☐ Secondary Data Analysis
- ☐ Clinical Trial (Hospital/Clinic)
- ☐ Family follow-up study
- ☑ Cross sectional survey
- ☐ Longitudinal Study (cohort or follow-up)
- ☐ Record Review
- ☐ Prophylactic trial
- ☐ Surveillance / monitoring
- ☐ Others

Targeted Population *(Check all that apply)*:

- ☐ No ethnic selection (Bangladeshi)
- ☐ Bangalee
- ☐ Tribal groups
- ☐ Expatriates
- ☐ Immigrants
- ☐ Refugee

Consent Process *(Check all that apply)*:

- ☐ Written
- ☑ Oral
- ☐ None
- ☑ Bengali language
- ☐ English language

Proposed Sample size: 30 Total sample size: _____ ☐

Sub-group _____ ☐ _____ ☐

_____ ☐ _____ ☐

Determination of Risk: Does the Research Involve *(Check all that apply)*:

- ☐ Human exposure to radioactive agents?
- ☐ Fetal tissue or abortus?
- ☐ Investigational new device?
  (specify_____)
- ☐ Existing data available from Co-investigator
- ☐ Human exposure to infectious agents?
- ☐ Investigational new drug
- ☐ Existing data available via public archives/source
- ☐ Pathological or diagnostic clinical specimen only
- ☐ Observation of public behaviour
- ☐ New treatment regime

Yes/No

☑ ☐ Is the information recorded in such a manner that subjects can be identified from information provided directly or through identifiers linked to the subjects?

☐ ☑ Does the research deal with sensitive aspects of the subject's behaviour; sexual behaviour, alcohol use or illegal conduct such as drug use?

Could the information recorded about the individual if it became known outside of the research:

☐ ☑ a. place the subject at risk of criminal or civil liability?

☐ ☑ b. damage the subject's financial standing, reputation or employability; social rejection, lead to stigma, divorce etc.

Do you consider this research *(Check one)*:

- ☐ greater than minimal risk
- ☑ no risk
- ☐ no more than minimal risk
- ☐ only part of the diagnostic test

Minimal Risk is "a risk where the probability and magnitude of harm or discomfort anticipated in the proposed research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical, psychological examinations or tests. For example, the risk of drawing a small amount of blood from a healthy individual for research purposes is no greater than the risk of doing so as a part of routine physical examination".

Yes/No

☐ ☐ Is the proposal funded? No ✓

If yes, sponsor Name: _____

Yes/No

☑ ☐ Is the proposal being submitted for funding ?

If yes, name of funding agency: (1) USAID, Dhaka

Do any of the participating investigators and/or their immediate families have an equity relationship (e.g. stockholder) with the sponsor of the project or manufacturer and/or owner of the test product or device to be studied or serve as a consultant to any of the above? N. A.

IF YES, submit a written statement of disclosure to the Director.

Dates of Proposed Period of Support	**Cost Required for the Budget Period ($)**
(Day, Month, Year - DD/MM/YY)	*a. Ist Year* *2nd Year* *3rd Year* *Other years*
Beginning date: 1 January 2002	_____ _____ _____ _____
End date: 31 March 2003	*b. Direct Cost :* US $ 129, 393; *Total Cost :* US $ 163,035

Approval of the Project by the Division Director of the Applicant

The above-mentioned project has been discussed and reviewed at the Division level as well by the external reviewers. The protocol has been revised according to the reviewer's comments and is approved.

Professor Lars Ake Persson — Name of the Division Director

Signature

Nov 1 2001 — Date of Approval

Certification by the Principal Investigator

I certify that the statements herein are true, complete and accurate to the best of my knowledge. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. I agree to accept responsibility for the scientific conduct of the project and to provide the required progress reports if a grant is awarded as a result of this application.

Signature of PI

Date: 1/11/01

Name of Contact Person (if applicable)

Abbas Bhuiya

Table of Contents

☑ Check here if appendix is included

PROJECT SUMMARY: Describe in concise terms, the hypothesis, objectives, and the relevant background of the project. Describe concisely the experimental design and research methods for achieving the objectives. This description will serve as a succinct and precise and accurate description of the proposed research is required. This summary must be understandable and interpretable when removed from the main application. **(TYPE TEXT WITHIN THE SPACE PROVIDED).**

Principal Investigator: Abbas Bhuiya

Project Name: Rapid Assessment Tool (RAT) for Better Health: Helping Essential Service Package Managers to be More Effective

Total Budget: US $ 163,035 Beginning Date: 1 January 2002 Ending Date: March 2003.

The proposal is based on the premise that the existing methods such as national surveys and EPI thirty cluster methods are not rapid enough for progarmme managers to take quick management decisions to enhance the programme performance. It is argued that lot quality acceptance sampling (LQAS) techniques can be effectively used to identify inadequate health areas by using less than 30 samples. The present study aims to demonstrate that decisions made by using the LQAS technique are statistically similar to that made by using routine data collection system, such as health and demographic surveillance system of Matlab. By using the LQAS method in the Urban Family Health Partnership NGO operated areas the feasibility of the adoption of LQAS by the programme managers will be assessed.

KEY PERSONNEL (List names of all investigators including PI and their respective specialties)

Name	Professional Discipline/ Specialty	Role in the Project
1. Abbas Bhuiya	Demographer/Statistician	Principal Investigator
2. P. K. Streatfield	Demographer	Co-Investigator
3. Ahmed Al Kabir	Programme Specialist	Co-Investigator

RAPID ASSESSMENT TOOL (RAT) FOR BETTER HEALTH: HELPING ESSENTIAL SERVICE PACKAGE (ESP) MANAGERS TO BE MORE EFFECTIVE

ABBAS BHUIYA
AND OTHERS

2001-024

DESCRIPTION OF THE RESEARCH PROJECT

Hypothesis to be tested:

Concisely list in order, in the space provided, the hypothesis to be tested and the Specific Aims of the proposed study. Provide the scientific basis of the hypothesis, critically examining the observations leading to the formulation of the hypothesis.

1. The conclusion derived about the performance of Community Health Workers (CHWs) / field workers in terms of utilization of EPI, safe motherhood, and family planning services by using rapid assessment technique is similar to that derived by using information from Health and Demographic Surveillance System (HDSS);

Ho: Ps=Pr; Ha: Ps≠Pr

Where, Ps is the proportion of health workers having less than a certain percentage of utilization/acceptance rate achieved using HDSS data

and

Pr is the proportion of health workers having less than a certain percentage of utilization/acceptance rate achieved using rapid assessment technique.

2. Programme personnel can use the rapid assessment methods effectively without any mistakes.

Specific Aims:

Describe the specific aims of the proposed study. State the specific parameters, biological functions/ rates/ processes that will be assessed by specific methods (TYPE WITHIN LIMITS).

The objectives of the present study are to compare the performance of the

1. CHWs in Matlab Health and Demographic Surveillance System (HDSS) area in terms of immunization, safe motherhood, (antenatal and postnatal checkup) and family planning services by using rapid assessment methodology with those derived by using in Matlab HDSS,

and to

4. Examine the feasibility (time and resource wise, and correct use in terms of implementation, analysis and interpretation of data) of using the above methodology by programme personnel,

5. Identify the operational problems in utilizing the above methods by the programme personnel,

6. Assess the training and logistics needs to incorporate the above methodology in the regular programme monitoring system,

7. Develop a training handbook containing procedures to be followed in applying the proposed rapid assessment tool.

Background of the Project including Preliminary Observations

Describe the relevant background of the proposed study. Discuss the previous related works on the subject by citing specific references. Describe logically how the present hypothesis is supported by the relevant background observations including any preliminary results that may be available. Critically analyze available knowledge in the field of the proposed study and discuss the questions and gaps in the knowledge that need to be fulfilled to achieve the proposed goals. Provide scientific validity of the hypothesis on the basis of background information. If there is no sufficient information on the subject, indicate the need to develop new knowledge. Also include the **significance and rationale** of the proposed work by specifically discussing how these accomplishments will bring benefit to human health in relation to biomedical, social, and environmental perspectives. (DO NOT EXCEED 5 PAGES, USE CONTINUATION SHEETS).

Background

One of the recent developments in the Bangladesh health and family planning sector is the delivery of Essential Service Package (ESP) from static facilities. The community clinics (CC), which are now being built, are the lowest level static facility with limited house-to-house visits. The CCs are manned by Family Welfare Assistants (FWAs) and Health Assistants (HAs), and are meant for a community of 6,000 populations. CCs will remain open five days a week. HA or FWA will make home visits once a week for follow-up of dropout cases and for disseminating health messages. The level immediate above the CCs is the Union Health and Family Welfare Centres (UHFWCs), which are mostly manned by one Sub Assistant Community Medical Officer (SACMO) and one family welfare visitor (FWV). FWVs are to provide clinical services at the CCs once a month. EPI services are being rendered from the CCs, EPI spots, and from other higher-level service points.'

Modification has also been made in the management information and record keeping systems. Combining the earlier health and family planning records, a unified MIS has been developed. The system will eventually be facility centred containing information on clients attending the facilities.

So far, the programmatic performance has been assessed in various ways. Of them, the service records maintained by the health and family planning workers, nation-wide cross-sectional surveys such as BDHS, and special surveys such as EPI thirty cluster coverage surveys or their derivatives are the important ones. It is argued below that none of these methods can effectively cater the needs of the local level programme managers or if they are tuned to do so they loss the essence of rapidness. Thus, there is a need for alternative rapid assessment methodologies.

Current Status of Assessment

The service records mostly comprise information on potential clients and services provided, and quite often not considered as an acceptable means of assessing programme performance in terms of outcome measures.

Bangladesh Demographic and Health Survey (BDHS) is a national cross-sectional survey done once in two years to generate national statistics on various outcome measures in relation to the impact of national health and family planning programmes. It covers nearly 12,000 households from both rural and urban areas (see for example, Mitra *et al.* 1997). The statistics generated by BDHS can only be disaggregated by Divisions, and urban and rural areas. While BDHS is very useful for monitoring programme performance at national and sub-national level, however, its utility to the lower level programme managers for improving the local programme performance is quite limited.

EPI cluster survey on the other hand is simple in terms of sampling scheme, implementation, and analysis of the data. It is somewhat rapid and can be carried out in a short period of time. It has the flexibility to generate statistics related to the programme performance at any level given the minimum number of 210 subjects are included in the survey within that level (Henderson and Sundaresan, 1982). Thus, if a programme manager wants to know about the performance of a CC, s/he has to include 210 respondents from the catchment area of the CC to follow the EPI cluster survey methodology.

Since the success of a programme depends on the utililization by people at the lowest level, thus identification of any problem should begin from the lowest level. Such an exercise should also be frequent such that the programme managers can take corrective measures quickly without wasting any time. Given the large number of health facilities at the lowest level, the task of carrying out of thirty-cluster EPI survey for each of the health facilities several times a year no longer remains small and rapid.

In an ideal scenario, assessment should be done at the lowest level with much smaller sample size, easy to carry out and interpret the results to make timely decisions, feasible to repeat several times a year, and finally, the ability to produce reliable statistics with known magnitude of error. Preferably, such a method should also be able to link the local programme management issues with the central bureaucracy of the Ministry of Health.

Research Design and Methods

Describe in detail the methods and procedures that will be used to accomplish the objectives and specific aims of the project. Discuss the alternative methods that are available and justify the use of the method proposed in the study. Justify the scientific validity of the methodological approach (biomedical, social, or environmental) as an investigation tool to achieve the specific aims. Discuss the limitations and difficulties of the proposed procedures and sufficiently justify the use of them. Discuss the ethical issues related to biomedical and social research for employing special procedures, such as invasive procedures in sick children, use of isotopes or any other hazardous materials, or social questionnaires relating to individual privacy. Point out safety procedures to be observed for protection of individuals during any situations or materials that may be injurious to human health. The methodology section should be sufficiently descriptive to allow the reviewers to make valid and unambiguous assessment of the project. (DO NOT EXCEED TEN PAGES, USE CONTINUATION SHEETS).

Proposed RAT

The most sought-after methods of project monitoring and evaluation are those that use small sample sizes and that can be carried out rapidly and that produces statistically reliable results. EPI cluster sampling methodology was an attempt towards that direction with some successes, however, as discussed above it may go out of hand in terms of size when applied at the lowest level of health services. Social science and public health science do not have any other rapid assessment procedure at hand other than EPI methodology. However, there are examples of statistical techniques used in industrial production line for quality control and in business sectors for selecting supply lots, which are based on much smaller sample size than those are in practice in the field of public health. One such method is the Lot Quality Acceptance Sampling (LQAS) or Acceptance Sampling (Grant and Leavenworth, 1988).

In LQAS a defective article is defined as one that fails to conform to specifications in one or more quality characteristics. A common procedure in LQAS is to consider each submitted lot of product separately and to base the decision on acceptance or rejection of the lot on the evidence of one or more samples chosen at random from the lot. When the decision is always made on the evidence of only one sample, the acceptance plan is described as a single sampling plan.

Any systematic plan for single sampling requires that three numbers be specified. One is the number of articles n in the lot from which the sample is to be drawn. The second is the number of articles a in the random sample drawn from the lot. The third is the acceptance number d. The acceptance number is the maximum allowable number of defective articles in the sample. More than d defectives will cause the rejection of the lot. For instance, if we have a situation with n=50, a=5, and d=0, it implies that "Take a random sample of size 5 from a lot of 50. If the sample contains more than 0 defectives, reject the lot; otherwise accept the lot." LQAS uses the binomial probability to calculate the probability of accepting or rejecting a lot.

To apply the above in the context of health service delivery, for example vaccination coverage, let us assume that coverage of DPT1 for a health area as p. In a health area with an infinitely large population, the probability $P(a)$ of selecting a number a of vaccinated individuals in a sample size n is calculated as:

$$P(a) = \frac{n!}{a!(n-a)!} p^a q^{n-a}$$

Where p = the proportion of actual coverage in the health area
q= (1-p)
n=the sample size
a= the number of individuals in the sample who received the service
n-a= the number of individuals in the sample without the service, usually denoted by d.

LQAS aids the investigator in choosing the sample size and the permissible value of n-a and interpreting the results. In order to use LQAS in the context of health programmes for example EPI, the following five initial decisions must be made (Rosero, Grimaldo, and Raabe, 1990; Valadez, 1991;Valadez and Bamberger, 1994).

1. Firstly, the health system manager must select the intervention to assess. In our case let it be the coverage of DPT1.

2. Secondly, the catchment area (in the context of DPT1 it may be the catchment area of an EPI Centre).

3. Thirdly, the target community to receive the intervention (infants in case of DPT1).

4. Fourthly, a triage system must be defined for classifying the level of coverage as adequate, somewhat inadequate, and very inadequate. This needs to be decided by the programme managers, policy makers or other stakeholders of the EPI.

5. Fifthly, the levels of the provider and consumer risks. In most cases it may be around 10%.

Using the information from the above five decisions, a series of operating characteristics (OC) curve[1], or their corresponding probability tables can be constructed with the above binomial formula. From the OC curves, one can select the sample size (i.e. n) and the number of un-immunized individuals allowed (i.e. d) in the LQAS sample for a given level of provider and consumer risk before deciding that a health area has substandard coverage.

Let us assume that consensus has been reached among the various stakeholders of the EPI in Bangladesh that EPI centers with 80% or more infants in their catchment area receiving DPT1 can be considered as performing adequately. While EPI centers with a coverage rate of 50% or less ought to be considered as very inadequately performing and be identified for attention. The ones in the mid-range 50% to 80% may be considered somewhat fine and for the time being no special attention is needed. By using these information, probabilities of detecting "adequately performing" or "inadequately performing" EPI centers can be calculated. Table 1 presents such probabilities along with provider and consumer risks[2] for various combinations of sample sizes and maximum allowable un-immunized infants in the sample.

It can be seen in Table 1 that with a sample of 28 children having nine or fewer un-immunized infants in the sample, EPI centers can be classified as "adequately" performing. Samples with more than nine un-immunized infants will identify "inadequately" performing EPI centres. Using this rule, managers will identify correctly areas with 80% or more coverage more than 95% of the time. Similarly, they can also

[1] An OC curve depicts the probabilities of accepting a lot based on the proportion of nonconformances in the lot, the sample size, and the value of d, allowable nonconformances. An OC curve enables decision makers to examine the possible risks involved.
[2] Provider's risk – probability of classifying an adequately performing health area as inadequate; consumer risk – probability of classifying a very inadequately performing health area as adequate.

judge the area as inadequate in which more than nine of the 28 children are un-immunized in more than 95% of the time. Following these procedures, optimum decision rules in terms of a feasible sample size and number of uncovered allowable subjects at given levels of consumers (infants in case of DPT1) and providers (EPI centers in case of DPT1) risk can be formulated for various indicators (use of ANC and other health services, quality of health workers etc.) by using the binomial probabilities as was done in Table 1. The same calculation can also be done in terms of children immunized instead of un-immunized children.

Table 1. Example of the application of the LQAS methodology to detect the probability of 80% or 50% coverage of health area residents with respect to vaccination according to sample sizes ranging from 8 to 28, and number of cases not immunized ranging from 0 to 10.

Sample size (n)	No. in the sample un-immunized (d)	Probability of detecting health areas with 80% coverage as adequate (a)	Probability of detecting health areas with 50% coverage as inadequate (b)	Provider Risk (1-a)	Consumer Risk (1-b)	Total classification error (1-a)+(1-b)
8	0	0.17	1	0.83	0	0.83
	1	0.50	0.96	0.50	0.04	0.54
	2	0.79	0.83	0.21	0.17	0.38*
	3	0.94	0.64	0.06	0.36	0.42
12	0	0.07	1.00	0.93	0.00	0.93
	1	0.28	1.00	0.73	0.00	0.73
	2	0.56	0.98	0.46	0.02	0.48
	3	0.80	0.93	0.21	0.07	0.28
	4	0.93	0.81	0.07	0.19	0.27*
	5	0.98	0.61	0.02	0.39	0.41
14	0	0.04	1	0.96	0	0.96
	1	0.20	1	0.80	0	0.80
	2	0.45	0.99	0.55	0.01	0.56
	3	0.70	0.97	0.30	0.03	0.33
	4	0.87	0.91	0.13	0.09	0.22*
	5	0.96	0.79	0.04	0.21	0.25
19	0	0.01	1	0.99	0	0.99
	1	0.08	1	0.92	0	0.92
	2	0.24	1	0.76	0	0.76
	3	0.46	1	0.54	0	0.55
	4	0.67	0.99	0.33	0.01	0.34
	5	0.84	0.97	0.17	0.03	0.20
	6	0.93	0.92	0.07	0.08	0.15*
	7	0.98	0.82	0.02	0.18	0.20
28	5	0.50	1	0.50	0	0.50
	6	0.68	1	0.32	0	0.32
	7	0.81	0.99	0.19	0.01	0.20
	8	0.91	0.98	0.09	0.02	0.11
	9	0.96	0.96	0.04	0.04	0.08*
	10	0.99	0.90	0.01	0.10	0.11

* - Optimal decision rule for a sample size.
Source: Adopted from Valadez 1991, p:73.

LQAS method can also be used to calculate coverage rate across several health areas with confidence intervals. Such a computation involves weighing the coverage rates in each of the health areas based on the samples by multiplying them with the fraction (no. of children in each of the health areas/total number of children in all the health the areas).

While the statistical reasoning behind the LQAS method and the calculation involved may seemed somewhat complicated, in fact its application in the field situation is very easy. Once the decision rules are made, ideally in consultation with the policy makers and programme managers, the task of collecting the required data and their use in deciding which of the health facility is working adequately or not, is very simple. The method can also be used for variety of other outcome variables.

Methodology

Objective 1: Compare the performance of CHWs in Matlab (HDSS) area in terms of immunization, safe motherhood, (antenatal and postnatal checkup) and family planning services by using rapid assessment methodology with those derived by using in Matlab HDSS.

LQAS methodology will be used to identify adequately/inadequately performing CHWS for a period of six months. Performance will be assessed in terms of EPI coverage, use of ANC and PNC services, and use of family planning methods by the villagers in each of the catchment areas of the CHWs. Data will be collected from mothers with infants, pregnant women, and women of reproductive age by trained female interviewers. The required number of respondents to be interviewed will be randomly chosen from the catchment area of the CHWs by using HDSS records as sampling frame.

Decision on cutoff points (utilization rate) to define a worker as adequate and inadequate will be made in consultation with programme personnel and other relevant parties. A calculation of allowable number of individuals not covered by any particular service and the associated provider and consumer risk for a variety of lower and upper thresholds and sample sizes ranging from 10-30 has been made and presented in Appendix – A. The decision on sample size and number of allowable individuals in the sample will be determined on the basis of the parameters in Appendix - A. Appendix – A would enable the programme managers to obtain the maximum number of allowable individuals not covered by the health service in question to classify a CHW as inadequately performing for various upper and lower cutoff points in the range of 30%-95% without needing any computation by them.

Results obtained from the LQAS methods will be compared with those based on HDSS records. Proportion of inadequately performed CHWs obtained by LQAS and those by HDSS will be compared by Z test and by cross-classification of the results from HDSS and LQAS.

Objective 2: Examine the feasibility of using the above methodology by programme personnel. This will be tested in Matlab as well as in NGO areas of the Urban Family Health Partnership (UFHP). UFHP has agreed to adopt this method in some of their areas on a test basis. The prgramme personnel both in Matlab and in UFHP areas will be trained on the method. Pre-test and post-test will be conducted among the programme personnel to assess their level of knowledge after the training. The researchers and the programme personnel will apply the LQAS jointly for the first six months to develop competence among the programme personnel. Moreover, the additional time needed to carryout the activity by the progarmme personnel and their capacity to implement, data gathering, analysis and interpretation of results will be assessed on the basis of their record of time needed, and observation made by the members of the research team while implementing the method by the programme personnel. Such observations will include items such as, use of the tables of decision rules, provider and consumer risk, ability to decide about number of samples and number of allowable individuals in a sample, drawing of sample, recording of data, and identification of inadequate areas. In addition, the opinion of the programme managers about the problems faced and the utility of the LQAS methods will be gathered.

Facilities Available

Describe the availability of physical facilities at the place where the study will be carried out. For clinical and laboratory-based studies, indicate the provision of hospital and other types of patient's care facilities and adequate laboratory support. Point out the laboratory facilities and major equipments that will be required for the study. For field studies, describe the field area including its size, population, and means of communications. (TYPE WITHIN THE PROVIDED SPACE).

The study will be carried out in the Matlab-HDSS area where information on immunization, safe motherhood services utilization, family planning use and the like are available as a part of routine data collection. The adoptability of the technique will be tested in both Matlab and in areas with UFHP activities. Survey teams will stay either in ICDDR,B or rented facilities in the study areas. Local transport

will be used for movement within and between the survey areas. Necessary computers are available for data analysis in Dhaka office.

UFHP has been providing various health services in 80 municipalities and four city corporations through its 214 static clinics and 363 satellite teams since 1997. LQAS will be used to identify adequately and inadequately performing lowest level service areas (satellite teams) in three municipalities to be selected in consultation with the UFHP management. The assessment will be made for service components mentioned in specific aim 1.

Data Analysis

Describe plans for data analysis. Indicate whether data will be analyzed by the investigators themselves or by other professionals. Specify what statistical softwares packages will be used and if the study is blinded, when the code will be opened. For clinical trials, indicate if interim data analysis will be required to monitor further progress of the study. (TYPE WITHIN THE PROVIDED SPACE).

Data will be coded and entered into computer. Necessary cleaning will be done before analysis. Proportions of inadequately performing health areas will be computed by dividing the number of inadequately performed health areas by total number of health areas. Equality of proportions will be tested by using Z statistics. Results of identification of inadequate areas by using LQAS and routine data collection or cross sectional surveys will also be cross classified to assess the conformity of the results obtained by LQAS and routine data and cross sectional surveys.

Ethical Assurance for Protection of Human Rights

Describe in the space provided the justifications for conducting this research in human subjects. If the study needs observations on sick individuals, provide sufficient reasons for using them. Indicate how subject's rights are protected and if there is any benefit or risk to each subject of the study.

The information on acceptance of immunization for children will be collected from mother/caregivers. Information on family planning practices, ANC, PNC and TT acceptance will be collected from women. Trained female workers will interview the female respondents.

The above do not involve any risk to respondents. All information given will handled with utmost confidentiality. Data will be coded and names will not be entered into computers. No individual can be identified from the study findings or from the computerised data files.

Informed verbal consent from the respondents will be obtained before starting the interview. The respondents will be informed of the study objectives and the nature of data to be collected beforehand. It will be entirely voluntary for an individual to participate in the study and an individual will have the right to discontinue participation at any time. The respondents will not be compensated for their participation in the survey.

Use of Animals

Describe in the space provided the type and species of animal that will be used in the study. Justify with reasons the use of particular animal species in the experiment and the compliance of the animal ethical guidelines for conducting the proposed procedures.

None

Literature Cited

Identify all cited references to published literature in the text by number in parentheses. List all cited references sequentially as they appear in the text. For unpublished references, provide complete information in the text and do not include them in the list of Literature Cited. There is no page limit for this section, however exercise judgment in assessing the "standard" length.

Black K. 1997. Business Statistics: Contemporary Decision Making. Second Edition. West Publishing Company, New York. pp: 889-943.

Grant E.L. and Leavenworth R.S. 1988. Statistical Quality Control. Sixth Edition. McGraw-Hill Book Company, New York. pp: 391-425.

Henderson, R.H. and Sundaresan T. 1982. Cluster sampling to assess immunization coverage: a review of experience with simplified sampling method. Bulletin of the World Health Organization, 60:253-260.

Mitra S.N. and Al-Sabir A., Cross A.R. and Jamil K. 1997. Bangladesh Demographic and Health Survey, 1996-1997. Dhaka and Calverton, Maryland: National Institute of Population Research and Tarining (NIPORT), Mitra and Associates, and Macro International Inc.

Rosero L., Grimaldo C., and Raabe C. 1990. Monitoring a primary health care programme with lot quality assurance sampling. Health Policy and Planning, 5:30-39.

Valadez J. and Bamberger M. 1994. Monitoring and Evaluating Social Programs in Developing Countries: A Handbook for Policymakers, Managers, and Researchers. EDI Development Studies. Washington D.C: The World Bank. pp. 390-400.

Valadez J.J. 1991. Assessing Child Survival Programs in Developing Countries: Testing Lot Quality Assurance Sampling. Boston: Harvard School of Public Health.

Dissemination and Use of Findings

Describe explicitly the plans for disseminating the accomplished results. Describe what type of publication is anticipated: working papers, internal (institutional) publication, international publications, international conferences and agencies, workshops etc. Mention if the project is linked to the Government of Bangladesh through a training programme.

Study results will be disseminated through workshops and seminars organized by ICDDR,B or other agencies. In addition written reports and papers will be produced.

Collaborative Arrangements

Describe briefly if this study involves any scientific, administrative, fiscal, or programmatic arrangements with other national or international organizations or individuals. Indicate the nature and extent of collaboration and include a letter of agreement between the applicant or his/her organization and the collaborating organization. **(DO NOT EXCEED ONE PAGE)**

The techniques after testing in Matlab will be applied in areas of Urban Family Health Partnership activities.

Biography of the Investigators

Give biographical data in the following table for key personnel including the Principal Investigator. Use a photocopy of this page for each investigator.

Appendix -- B

Voluntary Consent Form

Title of the Research Project: Rapid Assessment Tool (RAT) for Better Health: Helping Essential Service Package (ESP) Managers to be More Effective

Principal Investigator: Abbas Bhuiya

Before recruiting into the study, the study subject must be informed about the objectives, procedures, and potential benefits and risks involved in the study. Details of all procedures must be provided including their risks, utility, duration, frequencies, and severity. All questions of the subject must be answered to his/ her satisfaction, indicating that the participation is purely voluntary. For children, consents must be obtained from their parents or legal guardians. The subject must indicate his/ her acceptance of participation by signing or thumb printing on this form.

Appendix – C and D

Detailed Budget

Appendix - E

Other Support

Describe sources, amount, duration, and grant number of all other research funding currently granted to PI or under consideration. (DO NOT EXCEED ONE PAGE FOR EACH INVESTIGATOR)

Abbas Bhuiya,

US $ 500,000, Swiss Red Cross, 2001-2
US $ 100,000, Rockefeller Foundation, 2000-2001
US $ 199,000, Rockefeller Foundation, 2001-2002
US $ 500,000, Ford Foundation up to June 2002.

Check List

After completing the protocol, please check that the following selected items have been included.

1. Face Sheet Included
2. Approval of the Division Director on Face Sheet ☐
3. Certification and Signature of PI on Face Sheet, #9 and #10 ☐
4. Table on Contents ☐
5. Project Summary ☐
6. Literature Cited ☐
7. Biography of Investigators ☐
8. Ethical Assurance ☐
9. Consent Forms ☐
10. Detailed Budget ☐

Appendix - A

Decision rule for lot quality acceptance sample for various sample size (10-30) and lower (0-65%) and upper (30-95%) thresholds

L = Lower threshold, U = Upper threshold, DR = Decision rule, CR = Comsumer risk, PR = Provider risk

Sample size	Parameters L, U	0, 30	5, 35	10, 40	15, 45	20, 50	25, 55	30, 60	35, 65	40, 70	45, 75	50, 80	55, 85	60, 90	65, 95
10	DR, CR, PR	9, .028, .000	8, .086, .086	7, .167, .070	7, .10, .180	6, .172, .121	6, .102, .224	5, .166, .150	4, .249, .095	4, .150, .166	3, .224, .102	3, .121, .172	2, .180, .100	2, .070, .167	1, .086, .086
11	DR, CR, PR	10, .020,.000	9, .061, .102	8, .119, .090	7, .191, .069	7, .113, .161	6, .174, .115	6, .099, .210	5, .149, .149	4, .210, .099	4, .115, .174	3, .161, .113	3, .069, .191	2, .090, .119	1, .102, .061
12	DR, CR, PR	10, .085, .000	10, .042, .118	9, .083, .111	8, .132, .092	7, .194, .073	7, .112, .158	6, .158, .118	5, .213, .085	5, .118, .158	4, .158, .112	4, .073, .194	3, .092, .134	2, .111, .083	1, .118, .042
13	DR, CR, PR	11, .064, .000	10, .113, .025	10, .058, .134	9, .093, .118	8, .133, .099	7, .179, .080	7, .098, .165	6, .129, .129	5, .165, .098	5, .080, .179	4, .099, .133	3, .118, .093	2, .134, .058	2, .025, .113
14	DR, CR, PR	12, .047, .000	11, .084, .030	10, .124, .044	10, .063, .147	9, .090, .130	8, .119, .112	7, .150, .093	6, .184, .075	6, .093, .150	5, .112, .119	4, .130, .090	3, .147, .063	3, .044, .124	2, .030, .084
15	DR, CR, PR	13, .035, .000	12, .062, .036	11, .091, .056	10, .120, .062	9, .151, .061	9, .077, .148	8, .095, .131	7, .113, .113	6, .131, .095	5, .148, .077	5, .061, .151	4, .062, .120	3, .056, .091	2, .036, .062
16	DR, CR, PR	14, .026, .000	13, .045, .043	12, .065, .068	11, .085, .079	10, .105, .082	9, .124, .080	8, .142, .074	7, .159, .067	7, .074, .142	6, .080, .124	5, .082, .105	4, .079, .085	3, .068, .065	2, .043, .045
17	DR, CR, PR	15, .019, .000	14, .033, .050	13, .046, .083	12, .060, .099	11, .072, .106	10, .083, .107	9, .092, .105	8, .099, .099	7, .105, .092	6, .107, .083	5, .106, .072	4, .099, .060	3, .083, .046	2, .050, .033
18	DR, CR, PR	16, .014, .000	15, .024, .058	13, .094, .028	12, .108, .042	11, .119, .051	10, .128, .057	9, .135, .060	8, .139, .060	7, .141, .058	7, .057, .128	6, .051, .119	5, .042, .108	4, .028, .094	2, .058, .024
19	DR, CR, PR	16, .046, .000	15, .059, .013	14, .070, .035	13, .078, .054	12, .084, .068	11, .087, .077	10, .088, .084	9, .087, .087	8, .084, .088	7, .077, .087	6, .068, .084	5, .054, .078	4, .035, .070	3, .013, .059
20	DR, CR, PR	17, .035, .000	16, .044, .016	15, .051, .043	14, .055, .067	13, .058, .087	12, .058, .102	11, .057, .113	9, .122, .053	8, .113, .057	7, .102, .058	6, .087, .058	5, .067, .055	4, .043, .051	3, .018, .044
21	DR, CR, PR	18, .027, .000	17, .033, .019	16, .037, .052	15, .039, .083	13, .095, .043	12, .091, .056	11, .085, .068	10, .077, .077	9, .068, .085	8, .056, .091	7, .043, .095	5, .083, .039	4, .052, .037	3, .019, .033
22	DR, CR, PR	19, .021, .000	18, .025, .022	17, .027, .062	15, .071, .037	14, .067, .056	13, .062, .075	12, .055, .092	10, .107, .047	9, .092, .055	8, .075, .062	7, .056, .067	6, .037, .071	4, .062, .027	3,.022, .025
23	DR, CR, PR	19, .054, .000	19, .018, .026	17, .054, .023	16, .051, .046	15, .047, .072	13, .094, .041	12, .081, .055	11, .068, .068	10, .055, .081	9, .041, .094	7, .072, .047	6, .046, .051	5, .023, .054	3, .026, .018
24	DR, CR, PR	20, .042, .000	20, .013, .030	18, .040, .028	17, .036, .057	15, .076, .036	14, .065, .055	13, .053, .074	11, .094, .042	10, .074, .053	9, .055, .065	8, .036, .076	6, .057, .036	5, .028, .040	3, .030, .013
25	DR, CR, PR	21, .033, .000	20, .032, .007	19, .029, .033	17, .064, .025	16, .054, .047	15, .044, .071	13, .078, .044	12, .060, .060	11, .044, .078	9, .071, .044	8, .047, .054	7, .025, .064	5, .033, .029	4, .007, .032
26	DR, CR, PR	22, .026, .000	21, .024, .009	20, .021, .040	18, .047, .032	17, .038, .059	15, .067, .040	14, .052, .060	12, .083, .038	11, .060, .052	10, .040, .067	8, .059, .038	7, .032, .047	5, .040, .021	4, .009, .024
27	DR, CR, PR	23, .020, .000	22, .018, .010	20, .042, .015	19, .034, .040	17, .061, .030	16, .046, .053	14, .074, .036	13, .054, .054	12, .036, .074	10, .053, .046	9, .030, .061	7, .040, .034	6, .015, .042	4, .010, .018
28	DR, CR, PR	23, .047, .000	23, .014, .012	21, .031, .018	20, .024, .049	18, .044, .039	16, .070, .029	15, .050, .049	13, .074, .034	12, .049, .050	10, .068, .031	9, .039, .044	7, .049, .024	6, .018, .031	4, .012, .014
29	DR, CR, PR	24, .038, .000	24, .010, .014	22, .023, .022	20, .043, .022	19, .031, .049	17, .049, .039	16, .033, .065	14, .048, .048	12, .065, .033	11, .039, .049	9, .049, .031	8, .022, .043	6, .022, .023	4, .014, .010
30	DR, CR, PR	25, .030, .000	25, .008, .016	23, .017, .025	21, .031, .028	19, .049, .026	18, .033, .051	16, .048, .040	14, .065, .030	13, .040, .048	11, .051, .033	10, .026, .049	8, .028, .031	6, .026, .017	4, .016, .008

Explanation: The cell at the intersection of the row corresponding to sample size 28 and column with value of L, U=50,80 has DR=9, CR=.039 and PR=.044, implies that one can have 9 or fewer unimmunized chidren in a sample of 28 children to consider the health area as adequate taking 80% or more coverage rate as adequate and 50% or less as inadequate. Using this rule, managers will identify correctly areas with 80% or more coverage more than 95% (1-.049) of the time. Conversely, they will also identify areas with 50% or less coverage more than 95% of the time when they judge as inadequate health areas in which more than 9 of the 28 children lack the service.

Source: Valadez J. J. 1998. A training manual for using LQAS to manage decentralized health programs: A users handbook. Plan International.

Appendix – B

Consent Form in English

Assalamualaikum (or other forms of appropriate greetings). I am from the cholera hospital in Dhaka and I would like to talk to you for a while. I am here to know about immunization taken by you and your children, health check up that you resorted to before and after delivery, and use of family planning methods by you or your husband. The whole job will take around 15 minutes of time. The information generated out of this exercise will be used to assess the level of the health services you and your village receive. These informations will be useful to improve the health services in your village.

Please note that your participation in this activity is absolutely voluntary. You may stop answering to my questions anytime and also withdraw from the discussion session any time. Please also note that while I appreciate your time and participation in this activity but you will not be paid anything in cash or kind to compensate your participation.

If you decide to participate in this activity, the information you provide will be completely confidential and will only be used for research purposes mentioned before.

If you have any questions regarding the activity I will be happy to answer them.

Are you willing to participate in this work? Yes / No

_____

Signature of Investigator/ or agents

Date:

Appendix- c
সম্মতি পত্র

আসসালামু আলাইকুম/আদাব,

আমি কলেরা হাসপাতালের একজন কর্মচারী। আমি আপনার সাথে স্বাস্থ্যসেবার ব্যপারে কথা বলতে চাই। আমি বিশেষ করে আপনার ও আপনার বাচ্চাদের টিকা গ্রহন, গর্ভকালীন ও গর্ভ পরবর্তী কালীন সময়ে গর্ভসংক্রান্ত ব্যাপারে স্বাস্থ্য পরীক্ষা ও পরিবার পরিকল্পনার পদ্ধতি ব্যবহার সম্পর্কে তথ্যাদি জানতে চাই। এ কাজে মোট ২৫ মিঃ সময় লাগতে পারে। আপনার দেয়া তথ্যাদি থেকে আপনার এলাকার স্বাস্থ্যসেবার পরিস্থিতি সম্পর্কে জানা যাবে। এতথ্য আপনার এলাকার স্বাস্থ্য সেবা ব্যবস্থার উন্নয়নে কাজে আসবে।

একাজে আপনি অংশগ্রহন করবেন কি না এটা সম্পূর্ন ভাবে আপনার উপর নির্ভর করে। আপনি যে কোন সময় আমার প্রশ্নের উত্তর দেয়া বন্ধ করে দিতে পারবেন এবং একাজে অংশ গ্রহন করতে অসম্মতি জানাতে পারেন। আমরা আপনার অংশগ্রহনকে খুব মূল্যবান মনে করি। তবে উল্লেখ্য যে এ কাজে অংশ গ্রহনের জন্য আপনাকে কোন ক্ষতিপূরন/পারিশ্রমিক দেয়ার ব্যবস্থা নাই।

একাজে আপনি অংশগ্রহন করতে রাজী হলে আপনার দেয়া তথ্যাদি সম্পূর্ন গোপন রাখা হবে। উপরোল্লিখিত কাজছাড়া অন্য কোন কাজে আপনার তথ্যাদি ব্যবহার করা হবে না।

এব্যাপারে আপনার কোন প্রশ্ন থাকলে আমাকে জিজ্ঞেস করতে পারেন।

অপনি কি একাজে অংশগ্রহন করতে রাজী আছেন? হ্যাঁ / না

সাক্ষাৎকার গ্রহনকারীর সইঃ

তারিখঃ

Appendix - D

CURRICULUM VITAE
OF PRINCIPAL, CO-PRINCIPAL AND CO-INVESTIGATORS

Rapid Assessment Tools for ESP Managers

1 Name : Abbas Bhuiya

2 Present position : Head, Social and Behavioural Sciences Unit

3 Educational background : BA (Honours) MA in Statistics
(last degree and diploma & training relevant to the present research proposal) MA, Ph.D. in Demography

4. List of ongoing research protocols
(start and end dates; and percentage of time)

4.1. As Principal Investigator

Protocol Number	Starting date	End date	Percentage of time
2001-013	1-7-01	31-12-02	10
SBSP	1-7-93	30-6-02	55
94-002	1-1-94	31-12-02	10

4.2. As Co-Principal Investigator

Protocol Number	Starting date	End date	Percentage of time
92-028	1-09-00	31-8-02	15

4.3. As Co-Investigator

Protocol Number	Starting date	Ending date	Percentage of time
20001-001	1-9-00	31-8-02	10

5 Publications

Types of publications	Numbers
a) Original scientific papers in peer-review journals	32
b) Peer reviewed articles and book chapters	12
c) Papers in conference proceedings	many
c) Letters, editorials, annotations, and abstracts in peer-reviewed journals	
d) Working papers	many
b) Monographs	some

6 Five recent publications including publications relevant to the present research protocol

1. Bhuiya A., Aziz A., and Chowdhury M. (2001) Ordeal of women for induced abortion in a rural area of Bangladesh. *Journal of Health, Population and Nutrition* (in press).

2. Bhuiya A., Chowdhury M., Ahmed F. and Adams A. M. (2001) Bangladesh: An intervention study of factors underlying increasing equity in child survival. In Evans *et al.* (eds.) *Challenging Inequities in Health: From Ethics to Action*. New York: Oxford University Press, pp: 227-239.

3. Bhuiya A. and Chowdhury M. (2001) Beneficial effects of a woman-focused development programme on child survival: evidence from rural Bangladesh. *Social Science and Medicine* (in press).

4. Ahmed SM, Chowdhury M. and Bhuiya A. (2001) Micro-credit and emotional well-being: experience of poor rural women from Matlab, Bangladesh. *World Development* (in press).

5. Chowdhury AMR and Bhuiya A. (2001) Do poverty alleviation programmes reduce inequities in health? The Bangladesh experience. In Leon and Walt (eds.) *Poverty Inequality and Health: An International Perspective*. Oxford: Oxford University Press, pp: 312-332.

Appendix - E

Rapid Assessment Tool (RAT) for Better Health: Helping ESP Managers to be More Effective

Detailed Budget for 15 months

Item	Pay level	Time	% Effort	Annual salary $	Amount $
Personnel					
1 Principal Investigator (Ababs Bhuiya)	P4	15m	20	111,000	27,750
1 Co-Investigator (Kim Streatfield)	P5	15m	10	137,536	17,192
1 Field coordinator	NoA	15m	100	9,300	11,625
1 Senior Research/Statistical Officer	GS6	15m	100	6,443	8,054
1 Data Management Assistant	GS4	12m	100	3,795	3,795
1 Field supervisor	GS5	12m	100	4,995	4,995
8 Data collector	GS3	12m	100	3,185	25,480
1 Driver	GS2	15m	15	2,664	5,994
1 Administration Officer	GS5	15m	10	4,995	7,493
Sub-total					**95,185**
Other Personnel (Data entry)					**2,000**
Equipment					
2 Computer and accessories					3,000
1 Printer and accessories					1,000
Sub-total					**4,000**
Communication (Tel/fax/email)					**1,000**
Supply (Stationary, diskette, photocopy, gasolene etc)					**3,200**
Printing of questionnaire					**600**
Travel					
Transportation, per diem					10,000
Sub-total					**10,000**
Consultant (Airfare, perdiem, fees)					**8,000**
Dissemination					
Workshop					1,000
Report printing					1,000
Sub-total					**2,000**
Office maintenance					**4,000**
Miscellaneous/unforeseen					**1,200**
Total					**131,185**
ICDDR,B Overhead (26%)					34,108
Grand Total					**165,293**

S. Ma 28/10/2001

Appendix F

Rapid Assessment Tools

Questionnaire

Identification:
Name of respondent: _____; HDSS RID: _____

Village: _____, Household No.: _____; Individual No.: _____

Questionnaire

Questions	Answers
For currently married women of reproductive age (15-49 years) Are you or your husband using any methods to avoid pregnancy?	Yes –1, if yes what? No -2
For pregnant women (more than 3 months) Have you had any antenatal checkup for this pregnancy?	Yes – 1, from where? No – 2.
For mothers with infant more than 1 month Have your ------ infant had given ----- - vaccines? Information based on immunization card?	DPT1: yes-1, No-2 DPT2: yes-1, No-2 DPT3: yes-1, No-2 Measles: yes-1, No-2 BCG: yes-1, no-2 Yes – 1, No -2
For mothers with infants less than 3 months Have you had postnatal checkup after delivery of this baby?	Yes –1, if yes how many No-2 ---------

Appendix – G

Questionnaire in Bangla

Identification:

Name of respondent: _____; HDSS Regd No: _____

Village: _____; Household No: _____; Individual No.: _____

প্রশ্ন	উত্তর
১৫-৪৯ বছরের বিবাহিত মহিলাদের জন্য গর্ভধারন না করতে আপনি অথবা আপনার স্বামী কি বর্তমানে কোন পরিবার পরিকল্পনা পদ্ধতি গ্রহন করেছেন?	হ্যাঁ - 1, যদি হ্যাঁ হয়? তবে কি পদ্ধতি না - 2
তিনমাসের বেশী গর্ভবতী মহিলাদের জন্য আপনি কি বর্তমান গর্ভসংক্রান্ত ব্যাপারে কোন স্বাস্থ্যকর্মী/ডাক্তারের কাছে চেকআপে (স্বাস্থ্য পরীক্ষা) করতে গিয়েছিলেন?	হ্যাঁ - 1, হলে কোথায়? না - 2
একমাসের বেশী ও ১২ মাসের কমবয়সী বাচ্চার মাদের জন্য আপনার --------- বাচ্চাকে কি ---------- টিকা দিয়েছেন? কার্ড থাকলে কার্ড থেকে লিখে নিতে হবে।	DPT1: yes-1, no-2 মার কথা থেকে - 1 DPT2: yes-1, no-2 কার্ড থেকে - 2 DPT3: yes-1, no-2 Measles: yes-1, no-2 BCG: yes-1, no-2
তিন মাসের কম বয়সের বাচ্চার মাদের জন্য এ বাচ্চার -- জন্মের পরে কি ডেলীভারি সংক্রান্ত ব্যাপারে আপনি কোন স্বাস্থ্য কর্মী/ডাক্তারের কাছে চেকআপ করেছেন?	হ্যাঁ- 1, হ্যাঁ হলে কত বার? না- 2

Appendix - H

EVALUATION FORM

Title: Rapid assessment tool for better health : Helping essential service package

Summary of Referee's Opinions: Rank Score

	High	Medium	Low
Quality of project	X		
Adequacy of project design	X		
Suitability of methodology	X		
Feasibility within time period	X		
Appropriateness of budget	Can't judge		
Potential value of field of knowledge	X		

CONCLUSIONS

I support the project proposal

a) without qualification	X
b) with qualification	
c) on technical grounds	
d) on level of financial support	

I do not support the project proposal

Name of Referee:

ICDDR,B PROPOSAL

Rapid Assessment Tool (RAT) for Better Health: Helping Essential Service Package (ESP) Managers to be More Effective

GENERAL COMMENTS

This is an interesting proposal addressing a practical issue with direct implications. The description of LQAS is excellent.

Although LQAS has been around for some time, it never really received a wide following and it would be interesting to see how it performs in a setting like Bangladesh.

I have three main concerns:

1. A full description is needed regarding what data LQAS will be compared against. This is crucial to assessing the internal validity of the proposed study.
2. In objective 2, I would add a qualitative component including interviews with local health workers and district managers on how they perceive LQAS and – most important – if it actually helped them make decisions (and, if not, why). This is directly relevant to the issue of why LQAS is not as popular at it should be.
3. There is no reference to how many areas will be studied, and how this number will be estimated.

SPECIFIC COMMENTS

1. Please ensure that all abbreviations are spelled out in full at the beginning (e.g., SACMO, FWV, BHDS, etc).
2. In Table 1, defining the optimal decision rule (the lowest sum of provider and client risks) as the best alternative is not as straightforward as the authors suggest. This is akin to stating that the best diagnostic test is the one with the highest sum of sensitivity and specificity, which is not always true. Sometimes, one wishes to maximize sensitivity (one minus provider's risk) and sometimes specificity (one minus consumer's risk). I think this deserves a further discussion in the protocol.
3. LQAS, as the authors point out, can only produce coverage estimates across several areas by pooling results. It would be useful to discuss how many areas will be pooled to provide reliable coverage results.
4. How many areas will be studied? How many individuals in each area? It is not sufficient to state that "The decision on sample size and number of allowable individuals in the sample will be determined on the basis of the OC curves with the minimum provider and consumer risks". These calculations should be included in the protocol.