

## Original Articles

# Developing Community Based Maternal and Neonatal Health (MNH) Surveillance: Implications for Monitoring MNH Program in Bangladesh

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### Abstract

*The operation research, "Community Based PNC Study in Bangladesh" was designed with the objective to develop a feasible and sustainable postnatal care package to improving care of newborns and mothers. As a part of monitoring and evaluation of the operation research an independent surveillance system was set up. The objectives of the surveillance were to track the trends of antenatal, delivery and postnatal care over time, provide quarterly feed-back of progress of activities, and evaluate the effectiveness of the PNC package. Through literature review and series of workshops with relevant stakeholders the surveillance method and instruments were developed. Active surveillance was recommended for the two intervention areas. The surveillance had the scope of collecting information on antenatal, delivery, postnatal care of mothers and newborns, birth and death. A set of instruments was developed and pre-tested to be utilized in the surveillance system. Once a pregnant woman identified was designed to be followed up twice, 10 days before and after the EDD to collect information on antenatal, delivery and postnatal care. The surveillance finding would help to understand the trends of antenatal, delivery and postnatal care. The findings would also be helpful to evaluate the effectiveness of the intervention package. Community based MNH surveillance should be an integral part of maternal and newborn health programs in a country like Bangladesh.*

**Keywords:** Surveillance, postnatal care, Bangladesh

### Introduction

During the last two decades, there has been a substantial decline in infant mortality rates in Bangladesh. Changes in neonatal mortality, however, have not mirrored this trend; but rather stagnated. The neonatal mortality rate in Bangladesh is relatively high (37 per 1,000 live births in 2007)<sup>1</sup>, with an estimated 120,000 annual deaths. Bangladesh is committed to the Millennium Development Goals (MDG) but goal 4, reduction of child mortality by two thirds from the 1990 rate, is not likely to be achieved unless neonatal mortality is dramatically reduced.

One of the biggest threats to Bangladesh for achieving MDG 4 & 5 is that the majority of maternal and neonatal deaths and complications occur during the

postnatal period and over 85% of deliveries take place in the home with most attended by untrained providers<sup>1</sup>. By the end of the first week of postnatal period more than half of all maternal deaths<sup>2</sup> and three-quarters of all neonatal deaths<sup>3</sup> occur. Unlike antenatal and intrapartum care, where clear standards are usually available, explicit objectives and standards are often lacking for PNC. The majority of women and newborns needing care are in the community, whether urban or rural, throughout the post-natal period, and many will not access the formal health system for care even if it is available. Women who delivered at facilities are considered as received PNC by default. However, routine PNC visits are virtually absent in Bangladesh.

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Given the context, the operation research, “Community Based Postnatal Care Study in Bangladesh” was designed with the objective to develop a feasible and sustainable community-based approach to improving newborn care practices and practices related to care of postpartum mother using existing health care system. A community based postnatal care package has been designed to deliver in two locations through two different service delivery mechanisms, the government’s (GO) health system (Faridpur district) and GO-NGO (BRAC) MNCH system (Nilphamari district). Each of the intervention area is having a comparison area. The core content of the package is to deliver services by the community health care providers through six main contacts with the mother and the newborn at household level. The first two contacts are to provide antenatal care counseling to the pregnant women at home during second and third trimester. The third contact is for caring of mothers during delivery. The fourth through sixth contacts are to provide postnatal care of mothers and newborns at home within 24 hours, 2-3 days and 4-7 days respectively. Additional visits will be made to LBW babies on the 14th and 28th days. Also, an opportunistic visit will take place on the 42nd day at the EPI centre. During these contacts the community health care providers offer some simple but lifesaving care. The changes in the proportion of various care before and after intervention in GO and GO-NGO intervention areas will be compared with the respective comparison areas. The detailed study protocol has been published in the Journal of Bangladesh Perinatal Society<sup>4</sup>.

### Purpose of the surveillance system

As a part of monitoring and evaluation of the operation research an independent surveillance system was set up. The existing monitoring system of any health programs is very poor in Bangladesh<sup>5</sup>. In order to monitor community level activities there is shortage of human resources too. Moreover, those who are deployed are burdened with various activities. As a result, when ever any new program is implemented there is a possibility of inadequate monitoring. To overcome this constraint, in addition to the regular monitoring system, the independent surveillance system was designed. The findings of the surveillance would provide an opportunity to find out any gaps in the regular monitoring. The objectives of the

surveillance were to track the trends of antenatal, delivery and postnatal care over time, provide quarterly feed-back of progress of activities, and evaluate the effectiveness of the PNC package.

### Development of the surveillance system

**Design :** The surveillance system was designed by the Centre for Injury Prevention and Research, Bangladesh (CIPRB) personnel in collaboration with Save the Children USA and other partner organizations.

Steps in the design phase

1. Establish objectives
2. Develop indicators
3. Develop methods and data collection instruments
4. Field-test instruments

**First step:** The first step taken was to define specific information needs; specifically, what do we want to know? One principle applied in this step was to carefully include information that would have implicit action, information with a purpose. Thus, the system does not become overwhelmingly filled with “nice” but useless information that eventually causes the entire system to become unmanageable.

**Second step:** Once information needs, based on the objectives of the system, were defined, the program’s investigators worked on developing indicators that would comply with program information needs. Numerators and denominators were also defined, and their collection feasibility assured.

### Box 1: Key indicators of the MNH surveillance system

1. Percentage of pregnant women received two antenatal care counseling (ANCC) at home.
2. Percentage of women received at least 2 ANC at the facility
3. Percentage of births attended by skilled birth attendant
4. Percentage of newborns received 1<sup>st</sup> PNC within 24 hours at home
5. Percentage of newborns received 2<sup>nd</sup> PNC within 2-3 days at home
6. Percentage of newborns received 3<sup>rd</sup> PNC within 4-7 days at home

**Third step:** In order to develop the surveillance method and instruments extensive literature search was conducted to gather information on the surveillance method and instruments used in other similar surveillance activities. Findings of the literature review were presented in a workshop with the relevant stakeholders and later through series of workshops surveillance methods and instruments were developed based on the objectives of the system and the indicators.

### Surveillance method and instruments

#### a) Surveillance method

**Active surveillance:** An active surveillance was recommended by the workshop participants to collect relevant information. Data collection was suggested to be done by interviewing women and other household occupants through regular household visits at an interval of three months.

**Surveillance areas:** The surveillance was designed to be conducted in two intervention upazilas namely, Madhukhali of Faridpur district and Kishoreganj of Nilphamari district. From each selected upazila four unions were proposed to be covered in the surveillance. All households in each union were included in the surveillance system. The surveillance area of each union was divided into two blocks using some important geographical landmarks. For each block, comprising of about 2,500 households, one Surveillance Data Collector (SDC) was recruited.

#### Scope of the Surveillance

The surveillance has the opportunity to record information relevant for antenatal period, delivery and postnatal period and the service received during those periods.

**Pregnant women:** All pregnant women of the study areas were planned to be identified and their LMP and EDD to be recorded.

**Antenatal care counseling and antenatal care:** Number of antenatal care counseling and antenatal care visits received by each pregnant woman to be recorded.

**Delivery care:** The surveillance has the capacity to capture the delivery care.

**Postnatal care:** Postnatal care received by mothers and newborns within seven days of delivery would also be recorded.

**Birth:** All live births in the surveillance areas would be registered.

**Death:** Deaths occurred in the preceding one month (time interval of one visit by the data collector and the next) would be registered for mothers and newborns.

**Migration:** The surveillance has scope to record the following two types of migration

**In-migration:** When a person / a family would enter in a surveillance area to stay

**Out-migration:** When a person / a family would leave a surveillance area or if a member is out of a family for more than 6 months

### Operational definitions

The following operational definitions were finalized to use in the surveillance through workshops.

**Family** means “*Khana*” where all members of the household are sharing a common meal and living under the same roof.

**Household member:** Usual resident is considered as a member of a household. Moreover, any person residing in a household for the last 6 months is also considered as a household member. Moreover, any person joined a family with intent to live there for about 6 months will be considered as household member. A member of a household who left the family more than 6 months ago e.g. out of country for overseas job will not be included in the family list.

**Live birth:** A child born alive with at least took breath/cried once

**Still birth:** A child born with no signs of life, no breathing/crying

**Neonate:** A newborn not older than 28 days

**Low birth weight:** Birth weight less than 2.5 kg

### b) Surveillance instruments

The following instruments were designed through workshops to collect maternal and neonatal information at the community level, and to be used by individuals who are not medically sophisticated. Therefore special attention was given to make the instruments simple and easy to administer by the data collectors.

The following set of instruments were developed for the surveillance

1. *Pregnant women identification form*
2. *Follow-up plan form*
3. *Household information form* to collect demographic and socio-economic information of the households.
4. *Antenatal, delivery and postnatal care forms* to record relevant information on antenatal, delivery and postnatal care and women's knowledge on danger signs of antenatal, delivery and postnatal period.
5. *Birth registration form*
6. *Death registration form*: to collect relevant information on death of mothers and newborns.
7. *Marriage registration form*
8. *Out migration registration form*: When a person/family exits from the surveillance area is labeled as out migration. This form included date, type (i.e. individual, partial or whole family migration), place of migration and also the reason for migration.
9. *In migration registration form*: When a person/family enters the surveillance area from another location is labeled as out migration. The form contained the date, type (i.e. individual, partial or whole family migration), place and reason for migration.

**Fourth step:** The researchers proceeded to pre-test the effectiveness of the instruments in supplying the information needed by the program and its user-friendliness, thus four data collectors was trained to use the instruments on a small scale and report back to the team. The instruments were adapted based upon recommendations from users.

Implementation of the surveillance system

#### a) Management and training issues

**Recruitment of surveillance staff:** It was recommended that a total of 16 data collectors, 8 for each area would be required to collect data. It was also proposed that one supervisor in each surveillance area is needed to supervise the activities of the data collectors. One Data Manager has also been recruited to oversee the activities in both areas and communicate with the researchers.

**Training of surveillance staff:** After recruitment the surveillance staff has been trained at the respective upazila by the researchers. Both conceptual and practical sessions were designed in a five-day training programme. In this training programme the staff were familiarized with the research instruments, learnt the skills of interviewing and communication and the channel of data flow.

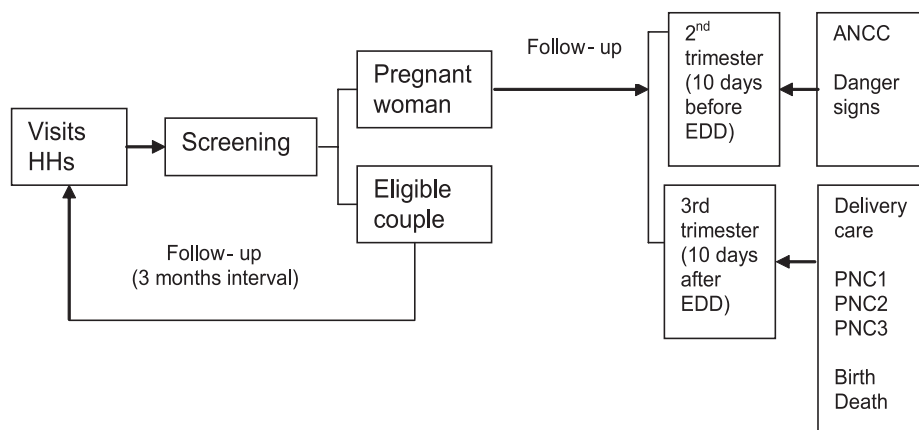
**Setting up project offices:** In each area a project office has set up with all the necessary logistics. The Supervisors are in charge of those offices.

**Contacting local authorities:** During launching of the study at district and upazila levels all the relevant stakeholders and officials were informed about the surveillance. Cooperation for surveillance activities were sought from the relevant personnel.

#### b) Data collection procedure

Prior to commencement of the surveillance activities, data collectors provided a unique number to each of the household in a systematic manner. The number was given using permanent paint in such a place that it could be easily seen. The household numbering was provided on the basis of each block of the surveillance area.

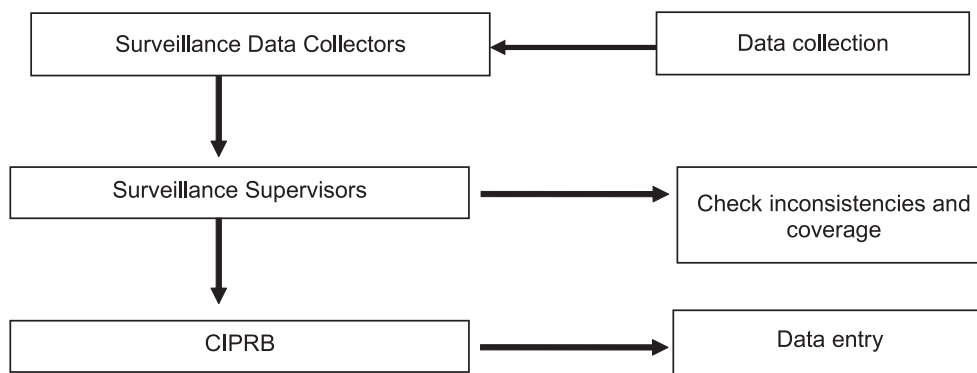
The surveillance data collectors (SDCs) visit each household regularly at three months interval. In the first visit a SDC interviews the head of the household or any responsible adult (18 years and above) members of the family to fill in the *Screening Form*. This form helps to screen the married women of reproductive age (15-49 years) and pregnant women in the family. Once a pregnant woman is identified, the form which contain socio-economic and demographic variables including LMP and EDD is used. The data collector then planned for the next two visits – the second visit during third trimester, 10 days before the EDD, to interview about their knowledge on danger signs and the services the mothers received during antenatal period; and the third visit after 10 days of EDD to collect information on delivery and post-natal care. During households visit if there is any birth, death, marriage and migration the data collectors fill in the respective forms.



**Fig. 1: Data collection procedure**

### c) Data Flow

After collecting data from the households the SDCs check all the forms in each afternoon and hand over these to their supervisors weekly. The supervisors check the forms for any inconsistencies and also count the number of households covered in that week. If any inconsistencies found in any forms then those are sent back to the respective SDC for correction. The supervisors then send the checked forms for data entry.



### d) Quality control of surveillance data

To maintain the quality of data surveillance data collectors and supervisors received extensive training from the researchers. Re-freshers training are planned to be provided every six months interval. There are opportunities to provide training on an ad-hoc basis if there is any modifications done in the surveillance forms.

The supervisors arrange meeting with the data collectors once in a week at the project office. Under the guidance of the supervisors data collectors cross check their colleagues collected data for completeness. If there is any missing information the data collector revisit the household and collect the data. The supervisors re-interview 1% households and

check for any inconsistencies in the collected data. The data manager and the researchers also check 1% of the collected forms and re-interview some of the households if any major problems detected.

### e) Data Management

In Foxpro software data entry program was done. Two data enterers recruited for data entry. Data collected in each month should be entered in the program and cleaned by the end of the next month. To maintain security and confidentiality of data set the entry into data server would be restricted by a security password. Only the authorized persons e.g. researchers and statisticians would have the access of the data sets. A detailed analysis plan was developed by the

researchers and statisticians. The data analysis was planned to be done at the end of each quarter.

### **Dissemination of the surveillance findings**

According to the suggestions of the workshops participants the findings of the surveillance was scheduled to be disseminated at local level quarterly, every six months in district level and yearly at the national level. At local level upazila level health and family planning managers, doctors and health workers were the expected audience for the dissemination. Similarly at district level both administrators and health managers and professionals were the proposed audience. At national level policy makers at health and family welfare were target for dissemination. Besides these the surveillance findings were also planned to discuss with the PNC program personnel for necessary modification of the project activities to attend the desired objectives.

### **Utilizations of surveillance yields**

Surveillance data would have utility in a wide variety of areas.

1. The surveillance yields was useful in describing trends of antenatal, delivery and postnatal care
2. The findings were compared with the data of the community and hospital based data to identify any gaps.
3. This provided inputs to improve implementation of the package.
4. The data was also useful in evaluating the effectiveness of the intervention programs.
5. This was also useful to improve the MNH monitoring and evaluation system.

### **Discussion**

One of the outstanding features of the surveillance system is that this was in built within the "Community Based PNC Study in Bangladesh" to monitor the outcome of the interventions. The surveillance also provided opportunity to identify gaps and thereby helped to improve the existing monitoring system.

The surveillance system had several strengths as well as some limitations. The system could effectively identify eligible couples and pregnant women; extract information related to delivery and different postnatal care activities within seven days of delivery. As the surveillance activities were independent of the program activities, some sort of blinding had been made for

the surveillance data collectors; as a result they could extract unbiased information. One of the major limitations of the system was migration of pregnant women. Culturally, in rural Bangladesh, pregnant women migrate to their parents' home before delivery. As a result the surveillance system could not track those pregnant women who migrate out from and migrate in the surveillance areas. Another limitation was the recall of information. The surveillance data collectors visited households after certain period of antenatal care counseling, delivery and postnatal care. Therefore they relied on the recall responses of the respondents. To minimize this recall bias the maximum duration of recall period was considered 15 days.

In different maternal and newborn health intervention studies similar surveillance system was utilized and found effective to measure the outcome of interventions. The development process of those surveillance systems was almost the same<sup>6,7</sup>.

### **Conclusion**

Community based active surveillance is very useful and effective tool for monitoring the outcome of interventions to improve maternal and neonatal health at community level. Conducting workshop is an important means for designing an MNH surveillance. Instruments for MNH surveillance are developed based on the indicators of the program. Community based MNH surveillance should be an integral part of maternal and newborn health programs in a country like Bangladesh.

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