ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

An Epidemiological Study on Coverage of Maternal and Child Health Services at Sub Centre Level in Northern India: A Rapid Assessment study

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Manuscript Info

Manuscript History:

Received: 14 July 2013
Final Accepted: 24 July 2013
Published Online: August 2013

Key words:
Coverage, Antenatal, Intranatal, Postnatal, contraception, immunization.

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Abstract

Research question: What is the level of coverage and quality of maternal and child health services at the level of sub centre?
Objectives:-To assess coverage of maternal and child health services at sub-centre level by MPW-F and to identify factors responsible for any low coverage.
Setting: Rural area.
Study design: Cross-sectional.
Sample size: A Multistage sampling was done to select the subjects. 40 sub centres were selected from eight blocks of Kashmir valley out of which 600 plus mother child beneficiaries were randomly selected.
Study variables: Antenatal care, intranatal, delivery practices, postnatal care, contraception, immunization and management of diseases in young children.
Results: Antenatal coverage for early registration was 95.2% but on interviewing the mother beneficiary it was found to be just 57.27%. Similarly reported coverage for 2 doses of tetanus toxoid was 100% while only 78.9% of the mothers agreed that 2 doses were given to them. For iron-folic acid prophylaxis the reported coverage was 95.2% while actually it was only 38.12%.The reported deliveries by trained personnel was 95.3% while actually it was found to be 79.4%. The reported coverage for full immunization was 95.3% while it was only 67.66% when actually investigated.76.5% was the reported coverage for eligible couples offered contraceptive choice while actually it was only 34%.
Conclusion: There is a need for reorientation of trainings of all female MPW in Antenatal, Intra-natal, Postnatal, Neonatal care and skill-based training in immunization.

Introduction

In any community mothers and children constitute an important and priority group especially in developing countries like India where, their numbers (constituting up to 2/3rd of total population), vulnerability to morbidity and mortality (constituting as special risk group) and amenability to prevention of ill health and mortality, to a large extent, makes them candidate for special attention. By improving health of mothers and children in any society we contribute to a large segment of general population and it is because of this special and usually combined health services for mother and child, the Maternal and Child Health (MCH) Services are considered globally more so in developing countries. **[1]**

Realizing that a lopsided growth of health delivery system had led to mal-distribution of manpower and infrastructure with growing social injustice and inequity; the government of India (GOI) had established peripheral health institutions like PHC's and sub centers (with sub centre as peripheral most contact point between health care system and community) in each of small administrative units. The goal of the National Rural Health Mission (NRHM) is to improve the availability of and access to quality health care by people especially for those residing in rural areas, the poor, women and children. **[2]**

The functioning of the sub centers showed tremendous change with emphasis on improvement in skills, knowledge, and coverage of activities, work-discipline, supportive supervision, record keeping, coordination and participation with the community through information, education and communication to bring qualitative and quantitative improvement of health services delivery and satisfaction to people.

Despite sociopolitical turmoil in Jammu & Kashmir; in most areas of health care explored by various national level surveys like family planning, marriage and fertility, maternity care etc, the women in J&K seem to be better placed than the average Indian women. Also the rate of progress is better for this state in respect of all measured indicators. **[3]** Also with recent inputs from RCH, NRHM and RCH-II, we do expect that there has to be an evident change in the coverage of services provided at sub-center level. The present strategy of providing comprehensive and integrated package of essential health services through primary health care approach remains the essence of response from any government for better coverage and utilization. To make this strategy effective the services need to be made universally available, affordable, and acceptable to this segment of population. It was with this background that this study was conducted to assess coverage of maternal and child health services at sub-center level and to identify factors responsible for any low coverage.

Material and Methods

Kashmir division at the time of study had 883 sub centers. A sample of 40 sub centers was to be obtained by multistage sampling procedure as per following methodology.

The sample size was obtained by calculating number of mother child pair beneficiaries to be interviewed for assessing coverage of maternal and child health services as per following calculations**. [4]**

$$N=Z2\ P\ (1-P)/d2$$

For a level of confidence of 95% Z value is 1.96, P =.25, d=0.05

The sample size thus equals 576 after multiplying by a design effect of 2 as is required for multi-stage sampling & cluster sampling. We thus selected approximately 600 plus mother beneficiaries. To interview 600 plus mother child beneficiaries, it was decided that 15-20 mother child pairs residing around each sub centre will be covered, thus giving a minimum of 40 sub centers (5% of 883 sub centers in Kashmir Division). The sub centers were then selected by using multi stage sampling.

The multi stage sampling for selection of sub centers was done as under:-

Stage I: Kashmir valley was divided into 8 districts administratively and 50% of the districts were randomly selected for the study.

Stage II: All the medical blocks in the selected district were enlisted. 50% medical blocks from each district were selected using simple random sampling technique thus giving a total of 8 blocks. Among these blocks included:

District Anantnag	Block Saller
	Block Bijbehara
District Budgam	Block Chattergam
	Block Budgam
District Baramull	Block Pattan
	Block Tangmarg
District Bandipore	Block Hajan
	Block Bandipore

Stage III: In the next stage sub-centers in each block were listed and randomly 5% of the functional sub centers were drawn to get the final list of sub centers as per population proportion sampling technique. So 8 sub centers were selected from district Anantnag, 12 sub centers were selected from district Baramulla, of 9 sub centers were selected from district Bandipora,11 sub centers were selected from district Budgam. Thus the

study was conducted in 40 sub-centers of the Kashmir valley.

Stage IV: List of household from the villages of the selected sub-centre was procured and home to home interview of mother's was conducted. Data was also conducted by interview from MPHW's placed at sub centers.

STUDY UNITS

The study units for observational study were the selected Sub centers, their female multipurpose workers & mother beneficiaries residing around the sub-centre.

Data collection techniques and tools

Checklist for the observation of the facilities available at the selected Sub centers was used. Recorded data available at Sub centers to assess the performance and achievements of the health workers was noted on a pre-designed questionnaire.

Evaluation of performance

Different indices were computed for the evaluation of physical facilities at SHCs and performance of health workers.

i) Physical facilities

In order to evaluate the availability of various physical facilities at the SHCs, these facilities were grouped under 3 categories:

1) Basic amenities 2) Drugs and supplies
3) Furniture and equipments

ii) Performance of health workers

In order to elicit the performance of the health workers so as to assess the overall functioning of the Sub centers during the year 2007-08, the following components were taken:-

- Antenatal Care
- Natal Care
- Post natal Care
- Immunization
- Family Planning

Results: - The data obtained was analyzed using SPSS software version 14 and p value <0.05 was considered significant.

RESULTS

Table 1 shows that sub centers visited for the study in District Budgam (block Budgam), district Bandipora (block Bandipora), district Baramulla (block Pattan) and district Anantnag (block Sellar) were on an average catering a population of 2673.3, 3005.6, 2858 & 3846; were at a distance of 3.9km, 4.5km, 4.2kms & 2.6kms from nearest PHC; were on an average catering a population of 2617.4, 5423.5, 2425.6 & 3610.2 and were at a distance of 4.1km, 4.9km, 3.3kms & 5.1kms from nearest PHC respectively.

Regarding the age distribution of the beneficiaries (mothers) it was seen that a majority of the women i e 37.1% were in the age group of 25-29 years followed by 31 % in 20-24 yrs and 14 % in the 330-34 yrs . Just 7.7 % were below 20 yrs. Mean age of the studied mothers was 26.6$\pm$5yrs, the mean age at marriage was 23.0$\pm$55 and mean marriage duration was 3.5 $\pm$ 1.7 years **(Table 2)**

Table 3 depicts the literacy status of the beneficiaries (eligible couple) with 45.2% of mothers being illiterate and another 8.6 % having just primary school education. 14.6% of the mothers had schooling up to middle school while another 13.3% had high school education and rest was above high school or had graduated. Among the males, 24.7% of the husbands of the studied mothers were illiterate, 13.1 % primary educated, 15.6 % middle class and 16.8 % up to high school while 17.6% of the husbands had studied graduation and above.

An average family size of the studied beneficiary was 6 with more than half (57.3%) of the families studied having a family size between 6-8 and another 20.2% with family size of > 8. The average number of children in the family was 3 with more than half (53.4%) of the families having 2 or less than 2 children and about 20 % having more than 3 children **(Table 4)**.

The child beneficiary's characteristics showed (**Table 5**) that 86.7% of the children studied were above 2 years of age, 7.7 % were in 1-2 yrs and only 5.51 % children were infants. 52.6% of children were males while 47.4% of the children were females.49.92% of children belonged to 1st order birth followed by 27.57 % in 2nd birth order, 14.6% in 3rd and rest 4$^{th\ or}$ above.

Table 6 observed that 55% of the sub-centres had survey registers, 82.5% had immunization registers;42.5% had eligible couple registers; 22.5% had birth & death registers; 87.5% had ante-natal registers, 35% delivery registers; 40% had family-planning registers;90% had a clinic register, none of the sub-centres had a referral register,70% of the sub-centres had a stock register,12.5% of the sub-centres had a sub-centre action plan, only 5% of the sub-centres had submitted reports as per CNAA,10% had a monthly work schedule register.

Table 7 revealed that under ante-natal care the reported coverage for early registration was 95.2% but on interviewing the mother beneficiary it was found to be just 57.27%. Similarly the reported coverage for 2 doses of tetanus toxoid is 100% while only 78.9% of the mothers agreed that 2 doses were given to them. For iron-folic acid prophylaxis the reported coverage was 95.2% while actually it was only 38.12%.The reported deliveries by trained

personnel is 95.3% while actually it was found to be 79.4%. Although the reported percentage of post-natal visits by HWF was 76% but the actual figures were only 6.7%.The reported coverage for full immunization was 95.3% while it was only 67.66% when actually investigated.76.5% was the reported coverage for eligible couples offered contraceptive choice while actually it was only 34%.10.5% was the reported coverage for I.U.D. insertions while actually there were no I.U.D. insertions.

Table 1: Average Population Covered by Sub-centers

S. No	District	Average Population/sub centre	Average Sub-centre distance from PHC
1	Budgam	2647.9	4km
2	Bandipora	5194.7	5.37km
3	Baramulla	2677.8	3.8km
4	Anantnag	3698.6	4.18km

Table 2: General Characteristics of Mother Beneficiaries

Age Distribution of the Studied Mothers		
Age (yr)	**N**	**%**
< 20	52	7.7
20 to 24	208	31.0
25 to 29	249	37.1
30 to 34	94	14.0
35 to 39	51	7.6
40 to 44	17	2.5
Total	671	100.0
Age (mean ± SD) yr	26.6 ± 5.9 (15, 44)	
Age at Marriage (mean ± SD) yr	23.0 ± 5.5 (12, 38)	
Mean Marriage Duration (± SD) yr	3.5 ± 1.7 (1, 9)	

Table 3: Socio demographic characteristics of Mother Beneficiaries

Female Literacy	N	%
Illiterate	303	45.2
Primary	58	8.6
Middle	98	14.6
High School	89	13.3
Above High School	58	8.6
Graduation & Above	65	9.7
Male Literacy		
Illiterate	166	24.7
Primary	88	13.1
Middle	105	15.6
High School	113	16.8
Above High School	81	12.1
Graduation & Above	118	17.6

Table 4: Family characteristics of mother beneficiaries

Family characteristics in the Studied Sample	N=671	%
Family Size of family		
≤ 5	151	22.5
6 to 8	384	57.3
>8	136	20.2
Average family size (Median/mean)	6	
Living Children in the family		
1	128	19.1
2	230	34.3
3	172	25.6
4	130	19.4
5	11	1.6
Average no of children	3	

Table 5: General characteristics of child beneficiaries

Variable		N=671	%
AGE	<1yr	37	5.51
	1-2yrs	52	7.7
	>2yrs	582	86.7
GENDER	Males	353	52.6
	Females	318	47.4
BIRTH ORDER	1st	335	49.92
	2nd	185	27.57
	3rd	98	14.6
	4th or >	53	7.90

Table 6: Status of records and reports – Availability

Status of records & Reports	Availability	
	N=40	overall %
Survey Register	22	55
Immunization Register	33	82.5
Eligible Couple Register	17	42.5
Birth & Death Register	9	22.5
Ante-natal Register	35	87.5
Delivery Register	14	35.00
Family Planning Register	16	40
Clinic Register	36	90.00
Referral Register	0	00
Stock Register	28	70
Health Worker's Dairy	5	12.5
Sub centre action plan	5	12.5
Monthly Reports as per CNAA	7	17.5

Last month report submitted as per CNAA	2	5
Monthly work schedule	4	10

Table 7: Reported coverage of Maternal & Child health care services at sub centre

	Reported	Expected (#)	Observed
Antenatal			
Early registration	95.26	60	57.27
2Tetanus Toxoid doses	100.00	100	78.9
5 antenatal visits	59.2	100	8.18
Iron Folic acid tablets prophylaxis	95.2	50	38.12
Number of high risk women referred	00	15	20.56
Intra Natal Care			
Deliveries by trained personnel	95.03	100	79.42
Institutional delivery	05.26	33	5.0
Post Natal Care			
3 post natal visits	76.00	100	6.7
Post natal mother receiving counseling	21.05		5.21
Immunization			
Children Fully immunized from 12-23 months	95.3	100	67.66
Vitamin A prophylaxis	45.9	100	7.15
Family planning			
Eligible couple offered contraceptive choice	76.5		34
I.U.D.insertions	10.52		00
Condoms	100.00		2.98
Oral pills	76.5		
Weight recorded	76.00		4.68
B.P recorded	95.00		00
Pneumonia cases treated with co-trimoxazole	12.5	100	11.3
Diahorrea cases treated with ORS.	15	100	18

#Source decentralized participatory planning in family welfare programme under target free approach.
(Observed is the actual utilization percentage obtained and expected is as per records)

DISCUSSION

The functioning of the peripheral most public health unit i.e. 'Sub-centre' in health care delivery system for delivery of primary health care services can be assessed by main indicator, the "coverage"- defined as the percentage of people receiving a specific intervention in those who need it and is an important output of health services and an essential part of any strategy to monitor progress in program implementation. **[5]**

Sub centre catchment

The present study conducted on (40) randomly selected sub-centers from Kashmir division of J&K showed that on an average population covered by a Sub center in Kashmir Division was 3208 ranging from 2560 to 4442 for different sub centers. This goes with the current recommended norms of 1 sub centre to serve 4000 population in J&K **[6]** and can be considered comparatively a better sub centre per population ratio in comparison to national level recommendations of 1 per 5000 population. This may be advantageous for

populations as clientage for each sub centre is smaller and hence quality of care can improve. A quarter (25%) of the sub-centers located in some difficult or hard to reach areas from this study were serving to the population of 1000- 3000. According to various recommendations **[7]** in areas where population is sparsely distributed a sub centre should cater to a population of not more than 3000 and such recommendations seem to have been taken care of in this part of the country, yet when we look at various recent reports of J&K proposed activities under RCH-II **[8],** only 1907 sub centers against 3381 required is available which is almost 46 % deficit for whole of J&K and this deficit is slightly lower i.e. 40 % for Kashmir division. Studies have also argued that mere existence of health services is not enough for better utilization of health services; it is the physical proximity of the health services that also play an important role in utilization of these services. **[9]**

Beneficiary characteristics

The characteristics of interviewed mother child pair as the main beneficiary served by the sub centers, showed that the maximum number (68.1%) of the interviewed females were between 20 and 30 years of age with an average age as 26.6years. More than half (54.8%) of the females were literate with their husband's literacy rate almost double than that of theirs. ½ of the beneficiaries were living in family size of 6-8 and another $1/5^{th}$ in families with >8 members. The coverage of various MCH services, confirmed from available records at sub centers showed lot of variations between reported coverage and actual services utilized.

MCH service Coverage

The records reported 95. 26 % pregnant ladies were registered for antenatal checkups and 59.2 % mothers were covered for 5 antenatal checkups at Sub centre, however no referral of any pregnant lady as per records from SC's was observed. Comparing these figures with actual utilization from beneficiaries, the reported coverage statistics is highly exaggerated since very few mothers (17.18%) had registered themselves at sub center, only 8.18% had gone for greater than 3 antenatal checkups to the sub-centre and surprisingly around 20 % mothers had informed that they were referred from sub center to higher institutions. The Inflated figures of antenatal registration and other service coverage could be either due to subsequent drop out in the visits of pregnant ladies to a sub center that was not recalled by mothers when approached for getting ANC utilization details or simply to show better work performance by the workers of the sub centers. Verma R et al in his study also reported a referral rate of only 3.4% which he calls as distressingly low. **[10]**

Besides variations in the coverage of various MCH services, the present study also highlighted that lack of seriousness on generating client centered and demand driven information as per the recently introduced Community Needs Assessment Approach (CNAA) for sub centers and its authenticity. While only 12.5% of the sub-centers had a sub-centre action plan, only 5% of the sub-centers had submitted reports as per CNAA, 10% had a monthly work schedule register with 22.5% having birth & death registers. Needs assessment is a concept poorly understood by the HWF and reorientation and revision of the 1977 curriculum for the HWF is the need of the hour.

The coverage of various MCH services, confirmed from available records at sub centers showed lot of variations between reported coverage and actual services utilized. The coverage data from the available records at the sub-centres shows that there is a consistent over-reporting of the data by the MPHW (F) posted at the sub- centres when compared to the actual utilization of the services by the pregnant females. There is consistent inflation of figures reported by the worker as was found by assessing the actual utilization of the services by the beneficiaries.

CONCLUSION

In conclusion the study shows that despite recent efforts to augment the health infrastructure, manpower and providing logistic support to the health sector under different national programs, our sub centres (the first health contact for delivering the health care in a community) are still lacking some basic facilities, fall short of logistic support, have lopsided staff with lack of supervision. Sub centres function as 10 am to 4pm institutions only and have non local staff who travels minimum of 4- 5 Kms distance to reach the sub centre. The female multipurpose workers running the sub centers are not fully tuned to their job specifications and have deficient skills to provide quality service to mothers and their young children. The supervision from PHC is lacking.

RECOMMENDATIONS

There should be provision for improvement of competence; confidence and motivation of ANM's, health workers to ensure full range of antenatal care activities specified under NRHM programme. Awareness should be generated amongst the community members by holding mothers' meeting and extensive IEC programme inviting opinions and suggestions from the clients and encouraging enhanced community participation for bringing about

a quantitative and qualitative change in the coverage of reproductive health programme; Support should also be obtained from local NGO's **[11]**. Last, but not the least the present study emphasizes the need for training and retraining of health functionaries, who by working at grass root levels can do a lot in improving the quality of antenatal services.

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