

**Original Research Article**

**Filaria elimination in India missing its deadline – Evidence from a Cross sectional study of four districts of Uttar Pradesh**

**Abstract**

**Objective:** India in its national health policy-2002 proposed to eliminate filaria from India by 2015. For this India started Mass Drug Administration in year 2004. Since then few states have already achieved zero micro filarial rate, but filaria is still endemic in many states and districts of India. And of now it seems the target of eliminating filarial will miss its deadline. **Materials and Methods:** A cross sectional study was conducted in Lucknow, Sitapur, Rae-Bareilly and Hardoi districts of Uttar Pradesh in the month of May 2014 to assess the coverage of MDA conducted earlier in 2014. A total of 480 houses from four districts were covered and the eligible population living in these households were interviewed with respect to various aspects of the MDA programme. **Results:** A total of 2455 individuals residing in 480 houses were covered. Among the eligible respondents 52.8 % were male. The overall coverage of MDA drugs in the selected four districts for Lymphatic Filariasis was 64.8 %. Out of 1592 persons to whom drug was given only 1154 (72.5%) actually consumed drug hence the net effective coverage of the MDA for LF for all four districts was just 47.0%. **Conclusion:** The net effective coverage rate was much below the recommended rate of 85.0%. The relative compliance was also below the recommended coverage rate.

**Key Words:** Filaria, Elimination, Mass drug administration

**INTRODUCTION:** It is estimated that 120 million people are infected with

filariasis in around 83 countries throughout the tropics and sub-tropics [1]. LF is an important cause of disability, social stigmatization, psycho-social and economic reductions in life

8 opportunities and a major burden on health and hospital resources, especially on account of  
 9 cost for surgical intervention needed [2,3]. More than One and half decade ago filaria was  
 10 identified as one of the diseases to be eliminated globally. World Health Organisation (WHO)  
 11 has envisaged global elimination of this disease by the year 2020 and the Government of  
 12 India is also signatory to the World Health Assembly Resolution in 1997 for its Global  
 13 Elimination[3].

14 In mainland India, *Wuchereria Bancrofti*, transmitted by the ubiquitous vector  
 15 *Culex quinquefasciatus*, contributes to 99.4% of the all infections [4]. The infection is  
 16 prevalent in both urban and rural areas. All ages and genders are susceptible to infection<sup>[4]</sup>.

17 In India the disease is prevalent in about 250 districts of 20 states and Union  
 18 Territories and it has been estimated that about 500 million population of the country is at the  
 19 risk[4]. Although this disease is the one of most prevalent tropical disease, it is rarely fatal  
 20 and thus in the developing countries it has been overshadowed by the killer diseases like  
 21 HIV/AIDS, TB and Malaria. The National Health Policy -2002 has envisaged elimination of  
 22 lymphatic filariasis in India by 2015[5].

23 The strategy of lymphatic filariasis elimination is through: Annual Mass Drug  
 24 Administration (MDA) of single dose of DEC (Diethylcarbamazine citrate) tablets for 5 years  
 25 or more to the eligible population to interrupt transmission of the disease.

26 In pursuit to achieve the goals, Government of India launched nationwide MDA in  
 27 2004 in endemic areas. Since the inception of the MDA campaign some states such Goa have  
 28 achieved Zero microfilaria rate and MDA has been stopped there since last two years[4]. The  
 29 coverage of MDA in Uttar Pradesh has been reported to be 80.45 %, 83.15 % and 70.69 % in  
 30 the year 2011, 2012 and 2013 respectively[4]. But there is always a need for the evaluation by  
 31 independent agency about reported figures and thus have a clear picture of ground reality.

32 **Objectives:** The present study was conducted with the primary objective of  
 33 assessing/evaluating the MDA programme in terms of coverage and compliance of mass drug  
 34 administration against filariasis, reasons for Non- compliance in four endemic district of  
 35 Uttar Pradesh.

36

37 **MATERIALS AND METHODS:Study area:** The present study was conducted in four of  
 38 the filarial endemic district in Uttar Pradesh namely district Lucknow the capital of state, and  
 39 adjoining three districts viz. Sitapur, Hardoi, and Rae Bareli. **Study design:** This was a  
 40 community based cross-sectional survey. The study was conducted as per the standard  
 41 guidelines on Elimination of Lymphatic Filariasis issued by Directorate of National Vector  
 42 Borne Disease Control Programme[6]. **Study period:** MDA campaign was undertaken from  
 43 in all the four districts at the same time i.e., from 9<sup>th</sup> January -11 January, 2014. The House to  
 44 House Survey to assess the coverage and compliance of MDA and to identify reasons for  
 45 non-compliance was conducted by study team during the month of May 2014. **Study teams:**  
 46 The faculty members and postgraduate students of Upgraded Department of Community  
 47 Medicine, King George's Medical University UP, Lucknow were part of the study  
 48 team. **Study tool:** A pre tested, semi structured schedule was used to collect data on all aspect  
 49 of programme evaluation. The study instrument was pre-tested and was translated to the local  
 50 language by translator. All members of the study team were trained regarding purpose of  
 51 study, method of conducting interview and data collection. **Sampling for house to house**  
 52 **survey:** In each of the four district same sampling strategy was used. From each district,  
 53 four clusters (three rural and one urban) of 30 house-holds each were selected. For selection  
 54 of rural sites, three PHCs/CHCs from the district were selected, on the basis of reported  
 55 MDA coverage. All Primary Health Centers (PHCs) /Community Health Centre(CHCs) in  
 56 the district were stratified into three groups: (i) PHC/CHC with coverage <65.0 percent (ii)

57 PHC/CHC with coverage between 65.0 percent and 80.0 percent and (iii) PHC/CHC with  
 58 coverage >80.0 percent. Thereafter in each category of the CHC/PHCs, one village was  
 59 selected randomly. In case, no PHC was found in a particular category, two PHCs from the  
 60 next higher category were selected. The household survey in each selected village was  
 61 conducted covering 30 households using study instrument. MDA registers/lists are  
 62 maintained by village ASHA or health worker of PHC/CHC for each village. 30 Household  
 63 were then randomly selected then from the register for the purpose of survey.

64 In urban area, the list of wards was used for selection of the cluster. Thereafter, one  
 65 ward was selected randomly for household survey. In that selected ward 30 households were  
 66 selected. In this way from each of the district, 120 households were surveyed for the purpose  
 67 of MDA evaluation. **Study participants:** All the resident of the selected household with  
 68 exception of those who were not eligible for mass drug administration during programme  
 69 schedule (i.e., pregnant and lactating women at the time of MDA, children below two years of  
 70 age and seriously ill persons). The house-hold members present at the time of survey were  
 71 interviewed to collect information regarding MDA with the help of study instrument. The  
 72 questions included whether person received DEC and Albendazole, whether they consumed,  
 73 reasons for not receiving DEC and Albendazole, reasons for not consuming DEC and  
 74 Albendazole if received, side effect/s of drug etc. The study team also observed  
 75 Intersectoral co-ordination, availability of action plan, baseline indices, and IEC activities in  
 76 selected district. The data was computed in Microsoft Excel and analysed thereafter. **Ethical**  
 77 **clearance:** The study was approved by ethical committee of the institute after due  
 78 consideration.

## 79 **RESULTS:**

80 Table 1 details the household and eligible population covered in study. A total of 480  
 81 (120 from each district) households were surveyed in the present study. During the MDA  
 82 campaign not all house hold of every village or urban ward received drugs some houses were

left out for some reason or other. The overall coverage rate of households for MDA for Lymphatic filariasis was 91.0 %. Household coverage rate was highest in district Sitapur( 94.2%) and it was lowest (76.7%) in district Rae-Bareli.

And total of 2,571 individuals resided in these 480 households. Out of these individuals a total of 95.5 percent individuals were eligible for Mass Drug Administration in the studied four districts. Highest number of eligible person were from the Sitapur district. Average number of eligible person living per house was 5.11(not shown in table).

**Table 1: Distribution of study population in Studied Districts**

| District     | Households Surveyed | Household Received Drugs During MDA |             | Total No. of Individuals in surveyed houses | Individual Eligible for MDA |             |
|--------------|---------------------|-------------------------------------|-------------|---------------------------------------------|-----------------------------|-------------|
|              |                     | n                                   | %           |                                             | n                           | %           |
| Lucknow      | 120                 | 109                                 | 90.8        | 645                                         | 636                         | 98.6        |
| Rae-Bareli   | 120                 | 107                                 | 89.2        | 561                                         | 532                         | 94.8        |
| Hardoi       | 120                 | 108                                 | 90.0        | 658                                         | 632                         | 96.0        |
| Sitapur      | 120                 | 113                                 | 94.2        | 707                                         | 655                         | 92.6        |
| <b>Total</b> | <b>480</b>          | <b>437</b>                          | <b>91.0</b> | <b>2571</b>                                 | <b>2455</b>                 | <b>95.5</b> |

Under MDA,doses of drug is different for different age group so we have to have a thorough knowledge about the number of eligible population in every age group. Table 2 details the two demographic variable of study population viz. age and gender. Among the eligible respondents 52.8 % were males. Among total eligible population 9.8 % were in group 2-5 years, 25.3% were in 6-15 years age group and maximum 64.9% were aged 15 years and above.

**Table 2: Distribution of study population by age and sex under MDA for Lymphatic Filariasis in studied districts**

| Age Group (years) | District | Male |   | Female |   | Total |   |
|-------------------|----------|------|---|--------|---|-------|---|
|                   |          | No.  | % | No.    | % | No.   | % |

|                    |              |             |             |             |             |             |              |
|--------------------|--------------|-------------|-------------|-------------|-------------|-------------|--------------|
| 2-5                | Lucknow      | 35          | -           | 26          | -           | 61          | -            |
|                    | Rae-Bareli   | 20          | -           | 19          | -           | 39          | -            |
|                    | Hardoi       | 30          | -           | 18          | -           | 48          | -            |
|                    | Sitapur      | 50          | -           | 42          | -           | 92          | -            |
|                    | <b>Total</b> | <b>135</b>  | <b>5.5</b>  | <b>105</b>  | <b>4.3</b>  | <b>240</b>  | <b>9.8</b>   |
| 6-14               | Lucknow      | 83          | -           | 74          | -           | 157         | -            |
|                    | Rae-Bareli   | 70          | -           | 67          | -           | 137         | -            |
|                    | Hardoi       | 88          | -           | 70          | -           | 158         | -            |
|                    | Sitapur      | 97          | -           | 72          | -           | 169         | -            |
|                    | <b>Total</b> | <b>338</b>  | <b>13.8</b> | <b>283</b>  | <b>11.5</b> | <b>621</b>  | <b>25.3</b>  |
| 15 and above       | Lucknow      | 212         | -           | 206         | -           | 418         | -            |
|                    | Rae-Bareli   | 170         | -           | 186         | -           | 356         | -            |
|                    | Hardoi       | 223         | -           | 203         | -           | 426         | -            |
|                    | Sitapur      | 218         | -           | 176         | -           | 394         | -            |
|                    | <b>Total</b> | <b>823</b>  | <b>33.5</b> | <b>771</b>  | <b>31.4</b> | <b>1594</b> | <b>64.9</b>  |
| <b>Grand Total</b> |              | <b>1296</b> | <b>52.8</b> | <b>1159</b> | <b>47.2</b> | <b>2455</b> | <b>100.0</b> |

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103           Table 3 details the various aspect of the drug distribution during MDA campaign. On  
104 being asked whether they(eligible population) received drug( Tab DEC & Albendazole in  
105 correct dose) during the MDA campaign 64.8 % of eligible population responded positively.  
106 This was maximum (81.1%) in district Sitapur, followed by district Rae-bareli and it was  
107 least (30.4 %) in district Hardoi.

108           On further asking it was found that of the total 1592 person to whom drug was given  
109 only 1154 (72.5%) actually consumed drug hence the net effective coverage of the MDA for  
110 LF for all four district was just 47.0%.On this aspect as well district Rae-Bareli performed  
111 best with 66.6 % effective coverage rate beating even the capital city of Lucknow and the  
112 poorest coverage was found in district Hardoi with mere 13.3 % net effective coverage rate.

113

114   **Table3: Coverage and compliance of Mass Drug Administration for**

**Lymphatic Filariasis in selected district (n= 2455)**

| Coverage and Compliance                                                                                                               | Lucknow<br>n=636 |      | Hardoi<br>n=632 |      | Sitapur<br>n=655 |      | Rae-Bareilly=532 |      | Total<br>(n =2455) |              |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------|------|-----------------|------|------------------|------|------------------|------|--------------------|--------------|
|                                                                                                                                       | n                | %    | n               | %    | n                | %    | n                | %    | n                  | %            |
| <b>Number of Eligible Persons to Whom Drugs Were Distributed</b>                                                                      |                  |      |                 |      |                  |      |                  |      |                    |              |
| DEC + Albendazole in correct dose                                                                                                     | 463              | 72.7 | 192             | 30.4 | 531              | 81.1 | 406              | 76.3 | 1592               | <b>64.8</b>  |
| <b>Relative Compliance</b> (Eligible persons who actually consumed drugs / Eligible persons to whom drugs was distributed ) (n= 1592) |                  |      |                 |      |                  |      |                  |      |                    |              |
| DEC + Albendazole                                                                                                                     | 311              | 67.2 | 84              | 43.8 | 436              | 82.1 | 323              | 79.6 | 1154               | <b>72.47</b> |
| <b>Effective Coverage Rate</b> (Eligible person who consumed drugs / Total eligible persons)(n=2455)                                  |                  |      |                 |      |                  |      |                  |      |                    |              |
| DEC+Albendazole in correct dose                                                                                                       | 311              | 48.9 | 84              | 13.3 | 436              | 66.6 | 323              | 60.7 | 1154               | <b>47.0</b>  |

Table 4 details the consumption pattern of drug by eligible population. As mentioned previously out of 1592 eligible persons to whom the drug was given only 1154 (72.48%) actually consumed it. Of that 56.21 % eligible respondent consumed drugs in presence of drug distributor and 16.26 % consumed drug even in the absence of drug distributor and 27.51 % of eligible population did not consume drug at all. So about 27.51 % of drug was wasted due to poor compliance on the part of study participants. Among those who did not consume drug most were children between 2- 5 years of age followed by eligible person in 6-15 years of age ( not shown in table).

**Table 4: Consumption and non- consumption of drug among eligible population( n=1592)**

| S No. | Survey Features                               |                                         | Result(n=1592) |   |
|-------|-----------------------------------------------|-----------------------------------------|----------------|---|
|       |                                               |                                         | No.            | % |
| 1.    | Consumed Drug In presence of Drug Distributor | Lucknow(Eligible population = 463 )     | <b>264</b>     | - |
|       |                                               | Rae-Bareilly(Eligible population = 406) | <b>256</b>     | - |
|       |                                               | Hardoi(Eligible population =192)        | <b>67</b>      | - |

|       |                                                                     |                                       |            |       |
|-------|---------------------------------------------------------------------|---------------------------------------|------------|-------|
|       |                                                                     | Sitapur(Eligible population = 531)    | <b>308</b> | -     |
| Total |                                                                     |                                       | 895        | 56.21 |
| 2.    | Consumed drug but Not in presence of drug Distributor               | Lucknow (Eligible population = 463 )  | <b>47</b>  | -     |
|       |                                                                     | Rae-Bareli(Eligible population = 406) | <b>67</b>  | -     |
|       |                                                                     | Hardoi(Eligible population =192)      | <b>17</b>  | -     |
|       |                                                                     | Sitapur(Eligible population = 531)    | <b>128</b> | -     |
| Total |                                                                     |                                       | 259        | 16.26 |
| 3     | Did Not Consumed Drug even when drug was given by drug distributor. | Lucknow (Eligible population = 463 )  | <b>152</b> | -     |
|       |                                                                     | Rae-Bareli(Eligible population = 406) | <b>83</b>  | -     |
|       |                                                                     | Hardoi(Eligible population =192)      | <b>108</b> | -     |
|       |                                                                     | Sitapur(Eligible population = 531)    | <b>95</b>  | -     |
| Total |                                                                     |                                       | 438        | 27.51 |

129

130 Table 5 shows that out of total eligible person who actually consumed drugs only

131 3.7% reported any kind of side effects, out of which most common side effect was abdominal

132 pain (46.5%) followed by vomiting (41.9%).

133 **Table5: Common sideEffect/s perceived due to MDA drugs (n= 1154)**

| S No  | Survey Feature                           |            | Result |     |
|-------|------------------------------------------|------------|--------|-----|
|       |                                          |            | No.    | %   |
| 1.    | Person reporting any kind of side effect | Lucknow    | 0      | 0.0 |
|       |                                          | Rae-Bareli | 19     | 1.6 |
|       |                                          | Hardoi     | 7      | 0.6 |
|       |                                          | Sitapur    | 17     | 1.5 |
| Total |                                          |            | 43     | 3.7 |

| Common Type of Side effects reported (n= 43 ) |                |    |      |
|-----------------------------------------------|----------------|----|------|
| 1.                                            | Vomiting       | 18 | 41.9 |
| 2.                                            | Abdominal pain | 20 | 46.5 |
| 3.                                            | Others         | 5  | 11.6 |

**DISCUSSION:** A very high coverage rate (>85%) in all the endemic areas, which if sustained rigorously for a period of 5-7 years (life cycle of adult worm), is required to interrupt the transmission and ultimately leading to elimination of filaria from a region. Whether a health programme is success or failure is determined by many factors. Among many known cause of programme failure, some are unplanned approach, lack of funding, improper monitoring and poor implementation. The present study evaluated only the implementation aspect of the MDA programme for the year 2014. We conducted a household survey of 480 houses of 4 districts of Uttar Pradesh and covered 2,455 eligible persons residing in those houses. In our study the effective household coverage was 91.0 %. The average coverage rate as provided by Chief Medical Officers for all four district was 75.65 %. Whereas as per our independent evaluation the net population coverage rate for MDA for all the four district combined was 64.8 % and net effective drug coverage was 47.0%, both of which were much below from what were officially reported. The coverage rate as provided by the Chief Medical Officer for the individual district were as follow: 60.93% for Lucknow, 87.90% for Sitapur, 90.71% for Rae-bareilly and 63.06% for Hardoi. Whereas as per our independent evaluation the net effective coverage rate for Lucknow was 48.9 %, for Hardoi was 13.3%, for Sitapur was 66.6% and for Rae-bareilly was 60.7 %. Independent evaluation such as our study coupled with independent microfilaria rate estimation and line listing of all hydrocele cases is necessary to tell us the actual filarial case load in India and effect of MDA on population. An important observation made in our study was that even the relative compliance (defined as person who actually consumed among all eligible individual to whom the drug was given) was also low (72.48%). This value provides a scope for improvement during the future rounds

of MDA and it must be ensured that at least relative compliance should be 100.0%.Of the total person who consumed drug 16.26 % consumed drug even in the absence of drug distributor.There can be many reason for consuming drug even in the absence of drug distributor and these should be further investigated as it may help in further improving programmeoutcome.Although side effects are unavoidable but it must be taken care of sothat fear of side effect should not prevent persons from taking drugs. In our study 43(3.7%) of all those who consumed drug experienced one or more type of adverse effect.Every type of apprehension with respect to drug should be addressed properlyby the means of health education by health worker so that relative compliance can be 100.0%.

A point of concern is that about a quarter (27.51%) of eligible population did not consumed even when the drug was given to them. Reason for such health behavior should be further investigated in order to implement MDA programme in a better way.Thus from this study we have learned that there are three key challengesfor the health administration to overcome for the proper implementation of MDA programme.First is to make household coverage 100.0 %, second is to increase the net effective coverage rate to at least 85.0 % of whole eligible population and last is to ensure that when an eligible person receives drugs he/she should consume it, if possible then in presence of drug distributor. Only then can be battle against filarial be won.

Reason for not receiving drugs and not consuming drugs varied greatly from village to village and from district to district.Thus a locally developed multipronged strategy must be chopped out in order overcome these local hurdles.

An important aspectwhich came to light during our study was that many person didn't consumed drug just because they were not told what significance the drug hold for the individual and for his community.Of them one important reason was that people did not consumed drug because they did not felt sick. Hence the relative compliance was not 100.0%.

For this health education campaign must be done a few days to a few weeks before the actual day of MDA. Health education should be imparted to all school children via school teacher and to the women of the village by ASHA/ANM of the village.

In our study we made an important observation that many persons living in surveyed households do seasonal migration to other cities and states in search of jobs. These people were missed during MDA rounds and they might act as a carrier to the non-endemic states. So a strategy should be designed for identifying and covering such populations. In the end we would like to add that all these such efforts should be sustained for a period of 5-7 years in order to be effective and bring any positive change.

**Limitation:** This study was conducted 3-4 months after the annual MDA round so there was a chance of recall bias in responses from the study participant.

**Consent :** All study participants gave valid consent for the study. Where the study participants were less than 18 years consent was obtained from parents/guardians.

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