

## ORIGINAL ARTICLE

## Evaluation of Mass Drug Administration to Eliminate Lymphatic Filariasis in Surguja and Surajpur District, Chhattisgarh

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### Abstract

**Background:** Mass Drug Administration of a single dose of DEC was launched on June 5, 2004 by the Government of India. MDA coverage increased gradually from 72.42% in 2004 to 88.96% in 2014. However, compliance has remained relatively low in most of the endemic areas as in 9 endemic Districts in State of Chhattisgarh. In Chhattisgarh State, Lymphatic Filariasis affected 14,818 people in the year 2011 and 13921 in the year 2013 with demonstrated manifestation. **Objectives:** To assess the coverage and compliance along with factors affecting compliance regarding MDA implementation in Surguja and Surajpur District of Chhattisgarh. **Methods:** A cross-sectional descriptive study was conducted from July–September 2021 in two district of Chhattisgarh. The division of segments and selection of the households was done based on the WHO criteria of coverage evaluation survey field guide in which from 30 villages, 450 households were covered. **Result:** The overall coverage rate was 95.55% in Surguja and 89.16% in Surajpur District. The overall compliance was 89.3% with Coverage-Compliance gap of 4.12. The Effective Coverage Rate was 89.3% in 2243 eligible population of Surguja and Surajpur District. Coverage and Compliance was found more in females as compared to males but was found to be statistically not significant. Coverage and Compliance was found more in Surguja district as compared to Surajpur district. **Conclusion:** Training programme for drug distributors should emphasize more on how to address the fear of side effects among beneficiaries and other reasons of low compliance for the benefit of the MDA programme.

### Keywords

Lymphatic Filariasis; Mass Drug Administration Compliance; Coverage

### Introduction

Neglected Tropical Diseases include diseases such as Soil Transmitted Helminths (STH), Lymphatic Filariasis, Onchocerciasis and Schistosomiasis, as well as Dengue and Rabies to list a few. Within the SDGs, the NTDs have been included as a target to end the epidemic of NTDs by 2030. (1) Mass Drug Administration of a single dose of DEC was launched on June 5, 2004, (National Filaria Day) by the Government of India. Co-administration of DEC with Albendazole, which was initiated in 2008, was expanded

to all districts in 2009. (2) In India, 250 districts of 15 States and 5 Union Territories have been identified as endemic for Lymphatic Filariasis. Numbers of Filaria Endemic Districts in State of Chhattisgarh were 9. In Chhattisgarh State, Lymphatic Filariasis affected 14818 people in the year 2011 and 13921 in the year 2013 with demonstrated manifestation.(3) MDA programme after 4–6 rounds with high coverage of  $\geq 80\%$  is expected to reach the elimination stage where the prevalence of infection falls below 1%. (4) MDA coverage increased gradually from 72.42% in 2004 to 88.96% in 2014. (5) However,

compliance has remained relatively low in most of the endemic areas. (6) In India, the population coverage during MDA has improved from 73% in 2004 to 83% in 2013. (7) Out of 255 districts in India, 203 districts have reported overall microfilaria rate to less than 1%. Out of the remaining 52 districts, 31 need high priority for focused intervention as in these districts, microfilaria rate is to be brought down to less than 1% by improving the drug compliance with regular round of MDA. (7) India's significant progress was recognized internationally as approximately 200 of 650 million populations at risk of Lymphatic Filariasis were made free of risk by 2017. (8) Overall MDA coverage rates varied between 48.8% and 98.8%, while compliance rates ranged from 20.8% to 93.7%. (9) The effective level of compliance 65%, was reported in only 10 of a total of 31 MDAs (five of 20 MDAs in rural areas and two of 12 MDAs in urban areas). (9) It requires constant efforts on a nationwide scale particularly in the endemic areas for interruption of transmission of this neglected tropical disease.

### Aims & Objectives

1. To find out the coverage and compliance of MDA in Surguja and Surajpur district, Chhattisgarh.
2. To assess the factors affecting coverage and compliance in districts of Chhattisgarh

### Material & Methods

**Study Design and Study Area:** A cross-sectional descriptive study was conducted from July-September 2021 to evaluate MDA activities implemented in Surguja and Surajpur districts of Chhattisgarh. These districts are endemic for lymphatic filariasis. The population of Surguja district is 23,59,886 as per Census 2011 and Surajpur district is 7,89,043 as per district administration, District-Surajpur, Chhattisgarh. Surajpur was declared a district on 15 August 2011 being split off from Surguja district. The MDA activities under the Filariasis elimination program were carried out in the districts of Surguja and Surajpur in the month of November 2020. ASHA worker, Anganwadi worker, Health worker male/ female considered as drug distributor, distributed tab DEC and tab Albendazole as MDA to the population in their respective areas. Children below 2 years, pregnant woman and persons seriously ill were excluded by them. Institutional Ethics Committee approval was sought out before the start of the study, letter EC/03/2021 GMC, Ambikapur dated 06/04/2021.

**Sampling technique:** The total Blocks under Surguja district are 7 and in the district of Surajpur are 6. In the district of Surajpur 3 blocks were selected randomly and all 7 blocks were selected in Surguja district. The 7 blocks of Surguja were Sitapur, Mainpat, Batauli, Dhourpur, Lakhanpur, Udaipur and Bhafouli. In the district of Surajpur, three blocks namely Ramanujnagar, Premnagar and Surajpur were selected out of six to follow population proportionate to size. Total Gram Panchayats are 615 in above mentioned blocks in the district of Surguja and

Surajpur. From these Gram Panchayats, 30 villages were selected using systematic random sampling. The sampling interval was 21. So from 615 Gram Panchayat every 21<sup>st</sup> village was selected. From each village 15 household were covered, so total 450 households were included in the study. The division of the segments and selection of the households was done based on the WHO criteria of coverage evaluation survey field guide (10) in which first 30 Subunits were selected that is 30 villages according to probability proportionate to estimated size sampling. Since most segments were expected to have about 50 household. (10) To complete the survey of that particular segment, sampling interval of 3 will completely represent of that segment and that particular village. One segment of 50 Household was selected from each chosen Subunit. In every Subunit there may be 4-6 segment depending upon the population of village which is demarcated by certain geographical boundaries. So one segment was selected randomly then every third household was selected from that segment to cover 15 household. All the individuals in the selected household were included as survey population. This sampling methodology was endorsed by the WHO Strategic Technical Advisory group for conducting coverage surveys for NTDs (World Health Organization, 2016).

**Data collection and analysis:** From the selected segment in a village, starting from the first house, every 3 house was included in the study till 15 household covered. If the household was found locked, the right hand thumb rule was followed. The trained intern, tutors, demonstrators of the department were the data collectors in the field. The head of the family or other adult person present at the time of survey was interviewed. They were informed about the purpose of the study and the written consent form was obtained from them. A standard pretested interview schedule developed by NVBDCP along with qualitative component to assess perception and attitude of the participants was used as study tool. The recall bias component was reduced by showing the tablet pack to the respondents. Microsoft Excel was used for compilation of accurately collected data. This data was checked for completeness and correctness and analyzed using SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc. Statistical tools applied were percentages, odds ratio, and confidence level. A Chi-square test was applied as statistical test of significance to find the relationship between coverage and compliance with age, sex and district.

**Working definitions:** As per NVBDCP guidelines, following are the working definitions used for the calculations of various indicators. (11)

1. Drug coverage rate: "It is the number of eligible persons who received DEC during MDA campaign. It is calculated as the total number of persons who received drug divided by eligible population expressed as percentage." (11)

2. Drug compliance: "It is the number of persons who ingested DEC in presence of a Drug Distributor (DD) during MDA campaign. It is calculated as the total number of persons who ingested drug divided by total number of persons who received the drug expressed as percentage." (11)
3. Coverage–Compliance Gap: "It refers to the people who got the drug but did not consume due to various reasons." (11)
4. Effective coverage rate: "It is the end product of coverage by the health system and compliance by community. The percentage for effective coverage was calculated after taking total number of people who were eligible for receiving DEC tablets as denominator. (Effective coverage = No. of people who had ingested sufficient dose of DEC tablets/Total people eligible for receiving the DEC tablets × 100)." (11)

## Results

In Surguja District, total 19 villages were covered in all seven blocks. Total population surveyed were 1565 from 285 household. The eligible population for MDA administration from surveyed population were 1394. The coverage rate of MDA administration was 95.5% and compliance was 96.1% with Coverage-Compliance gap of 3.83. The Effective Coverage Rate of MDA Administration in the Surguja district was 91.89. The coverage rate was 100% in 8 villages with lowest coverage was 83% in village Rajauti. The compliance was fairly good i.e. above 90% in almost all the villages. The lowest Effective Coverage Rate 74.07 was found in the village Rajauti in Sitapur block. ([Table 1](#))

In Surajpur District, total 11 villages were covered in 3 blocks. Total population surveyed were 935 from 165 household. The eligible population for MDA administration from surveyed population were 849. The coverage rate of MDA administration was 89.1% and compliance was 95.3% with Coverage-Compliance gap of 4.63. The Effective Coverage Rate of MDA Administration in the Surajpur district was 85.04. The lowest coverage was 55.26% in village Kaushalpur. Maximum 100% Coverage rate was found in village Shyampur. The Lowest compliance 66.67% and lowest Effective Coverage Rate 36.34% was found in village, Kaushalpur.

The overall coverage rate was 93.1% from 30 villages covering 450 households in Surguja and Surajpur Districts of Chhattisgarh. The overall compliance percentage was 89.3% with Coverage-Compliance gap of 4.12. The Effective Coverage Rate was 89.3% in 2243 eligible population of Surguja and Surajpur Districts of Chhattisgarh. ([Table 2](#))

The Coverage and Compliance was found more in females as compared to males but was found to be statistically not significant. ([Table 3](#))

The Coverage and Compliance was found more in Surguja district as compared to Surajpur district and was found to be statistically significant with Odds ratio 2.66. ([Table 4](#)) The maximum coverage 45.5% and maximum compliance 45.5% was found in the age group of 19-40 years i.e. in adults than in middle age, children and geriatric group but was found to be statistically not significant. 23 respondents cited that they were absent or went to other place for work or study, so not consumed medicine. 19 respondents forgot to take the drugs. 17 respondents cited that the information of MDA was not given to them by family member so did not consumed medicine. 13 respondents cited that MDA was not necessary because they were not sick. 13 respondents had fear of side effects so they didn't consumed medicine and 3 respondents said that medicine had bad taste so not swallowed drugs. 47% subjects received medicine through ASHA, 37% got medicine through ANM and 17% given by Anganwadi worker. 33% participants swallowed medicine in front of Drug Distributor (DD). 60% participant agreed that DD explained importance of MDA, disease prevention, side effect of MDA. 80% participants were aware that that MDA was going to happen, out of those, 60% received information given by ASHA/ANM.

## Discussion

In the present study, the overall coverage rate was 93.1% covering 450 households in Surguja and Surajpur Districts of Chhattisgarh. The overall compliance percentage was 89.3% with Coverage-Compliance gap of 4.12. The Effective Coverage Rate was 89.3% in 2243 eligible population of Surguja and Surajpur Districts of Chhattisgarh. In a study conducted by Bhatia et al, overall coverage rate amongst 590 study population was found to be 91.47% covering 120 households (90 rural and 30 urban) with effective coverage rate 71.1%. There was more coverage and compliance in females as compared to males. (12) Similarly in present study also, Coverage and Compliance was found more in females as compared to males but was found to be statistically not significant. In a study conducted by Kulkarni et al, the overall coverage of MDA was 82.3% among 1,022 beneficiaries and compliance among those who had received the tablets was 52.1% with effective coverage rate 42.9%. (13) The coverage rate of MDA in the study conducted by Gururaj et al. was 76%. which is far below the expected coverage to achieve the interruption of transmission and elimination of disease. (14) On comparison with evaluation survey conducted by Shivalingaiah et al. in Kalaburagi and Yadgir districts (2018), coverage rate was 83.17% and 86.71%. (15) But in present study, Coverage and Compliance was found more in Surguja district as compared to Surajpur district and was found to be statistically significant

Effective Coverage Rate (ECR) is a better indicator and the same needs to be taken into consideration during

evaluation. The ECR in the present study was 89.3 %. On the contrary, studies conducted by Hoolageri et al. and Mane and Bhovi in Bidar district where ECR was 78.3% and 68%. (16, 17) In a study conducted by Banerjee et al. found that non-consumption of MDA was more in males as compared to females and also in younger age group (2 to 5 years) which were found to be statistically significant factors. (18) But in present study, maximum compliance was found in adults than in middle age, children and geriatric group but was found to be statistically not significant.

In a study conducted by Hussain et al. found the reasons for non-compliance of MDA which includes mainly the fear of side effects, lack of awareness of the benefits of MDA, and non-attendance of health staff in the villages. (19) Same study mentioned the operational difficulties which were 1. Inadequate training of drug distributors, 2. Lack of good communication activities before the MDA campaigning and 3. Absence of follow-up by health workers following MDA. (19) In the present study also, the reasons found for the non-compliance were due to absenteeism of the beneficiaries during MDA, forgetfulness, lack of awareness of benefits of MDA and fear of side effects of drugs.

### Conclusion

The overall coverage rate, compliance rate and effective coverage rate in both district of Chhattisgarh is quite satisfactory but to achieve successful implementation of MDA program, focus should be on training of Drug Distributors.

### Recommendation

In the absence of the beneficiary in the family, tablets should not be given at the HHs as absenteeism as one of the reason found for low compliance of MDA. This may require repeat visits to the house by DD. Training programme for Medical Officers and health workers (DDs) involved in MDA should emphasize more on how to address the fear of side effects among beneficiaries, other reasons of low compliance and benefits of the MDA programme. Drum beating and mike announcement 1 -2 days prior to the MDA, can be used as IEC tool as these traditional methods are still effective in rural India. In regular Indian Medical Association (IMA) meeting, the importance of MDA need to be emphasized and same should be disseminated to private practitioners with practical approach.

### Limitation of the study

Recall bias was observed in the study because of delay of survey due to second wave of Covid- 19 pandemic. This was reduced by showing them MDA medicine packs and drugs while collecting relevant data.

### Relevance of the study

This study assessed factors associated with coverage and compliance of MDA in two district of Chhattisgarh with

inter-district comparison. Further qualitative in depth studies are required to explore the reasons for non - compliance of MDA.

### Authors Contribution

HGM, MAP contributed for conception and design of the study. HGM, PP, AV are responsible for data collection, literature search, data analysis and its interpretation. HGM, MAP are responsible for manuscript preparation and drafting. All authors approved final submitted version.

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**Tables**

**TABLE 1 COVERAGE RATE, COMPLIANCE RATE, COVERAGE COMPLIANCE GAP AND EFFECTIVE COVERAGE RATE IN DISTRICT SURGUJA**

Block	Village	Population Surveyed	Eligible Population	Drug Given(coverage)	Drug Consumed	CCG %	Effective Coverage Rate
Sitapur	Rajauti	89	81	67(82.72%)	60(89.55%)	10.45	74.07
	Soor	73	62	54(87.10%)	51(94.44%)	5.56	82.26
	Jamzariya	70	63	61(96.83%)	61(100%)	0	96.83
Lakhanpur	Kusu	90	82	70(85.37%)	70(100%)	0	85.37
	Remhla	73	63	58(92.06%)	58(100%)	0	92.06
	Korja	94	82	82(100%)	78(95.12%)	4.88	95.12
Bhafouli	Bartikra	75	67	66(98.51%)	62(93.94%)	6.06	92.54
	Labji	77	67	67(100%)	65(97.01%)	2.99	97.01
	Kanchanpur	81	72	72(100%)	67(93.06%)	6.94	93.06
	Rakeli	88	81	80(98.77%)	75(93.75%)	6.25	92.59
Udaipur	Jamdih	72	63	60(95.24%)	59(98.33%)	1.67	93.65
	Kathmunda	96	86	80(93.02%)	80(100%)	0	93.02
Dhourpur	Jarhadih	81	74	74(100%)	72(97.30%)	2.70	97.30
	Chitarapur	90	78	78(100%)	76(97.44%)	2.56	97.44
	Kepi	90	82	82(100%)	80(97.56%)	2.44	97.56
Batauli	Poksari	78	72	65(90.28%)	62(95.38%)	4.62	86.11
	Ghutarapara	75	69	69(100%)	67(97.10%)	2.90	97.10
Mainpat	Sarbhanja	97	83	80(96.39%)	73(91.25%)	8.75	87.95
	Jamkani	76	67	67(100%)	65(97.01%)	2.99	97.01
<b>Total (Household=285)</b>		1565	1394	1332(95.55%)	1281(96.17%)	3.83	91.89

**TABLE 2 COMPLIANCE RATE, COVERAGE COMPLIANCE GAP AND EFFECTIVE COVERAGE RATE IN SURAJPUR**

Block	Village	Population Surveyed	Eligible Population	Drug Coverage	Drug Consumed(compliance)	CCG %	Effective Coverage Rate
Ramanuj nagar	Rajapur	81	72	70(97.22%)	70(100%)	0	97.22
	Kaushalpur	82	76	42(55.26%)	28(66.67%)	33.33	36.84
	Ganeshpur	79	70	65(92.86%)	63(96.92%)	3.08	90
Surajpur	Dumariya	78	71	66(92.96%)	66(100%)	0	92.96
	Pasla	79	72	71(98.61%)	71(100%)	0	98.61
	Kamalpur	98	90	81(90%)	80(98.77%)	1.23	88.89
	Jainagar	97	90	84(93.33%)	79(94.05%)	5.95	87.78
	Shivnandanpur	91	80	75(93.75%)	74(98.67%)	1.33	92.50
	Gajadharpur	78	71	58(81.69%)	54(93.10%)	6.90	76.06
	Premnagar	Raghunathpur	77	70	58(82.86%)	54(93.10%)	6.90
Shyampur		95	87	87(100%)	83(95.40%)	4.60	95.40
<b>Total Household=165</b>		935	849	757(89.16%)	722(95.37%)	4.63	85.04
<b>Total Household=450</b>		2500	2243	2089(93.13%)	2003(95.88%)	4.12	89.30

**TABLE 3 COVERAGE AND COMPLIANCE AMONGST MALE AND FEMALE**

Gender	Coverage		Total	P Value	Compliance		Total	P Value
	Yes	No			Yes	No		
Male	1048(92.6%)	84(7.4%)	1132(100%)	0.294 Chi-Square v=1.100	999(88.3%)	133(11.7%)	1132(100%)	0.105 Chi-Square v=2.633
Female	1041(93.7%)	70(6.3%)	1111(100%)		1004(90.4%)	107(9.6%)	1111(100%)	
	2089(93.1%)	154(6.9%)	2243(100%)		2003(89.3%)	240(10.7%)	2243(100%)	

**TABLE 4 COVERAGE AND COMPLIANCE IN SURGUJA DISTRICT AND SURAJPUR DISTRICT**

District	Coverage		Total	P Value & OR(95%CI)	Compliance		Total	P Value & OR(95%CI)
	Yes	No			Yes	No		
Surguja	1332(95.6%)	62(4.4%)	1394(100%)	0.002.611(1.869-3.647)	1281(91.9%)	113(8.1%)	1394(100%)	0.00 1.994(1.523-2.611)
Surajpur	757(89.2%)	92(10.8%)	849(100%)		722(85%)	127(15%)	849(100%)	
	2089(93.1%)	154(6.9%)	2243(100%)		2003(89.3%)	240(10.7%)	2243(100%)	