



# Coverage Evaluation and Compliance of Mass Drug Administration Campaign in Nanded District of Maharashtra

Nazia Aram M Khan<sup>1</sup>, Prakash L Gattani<sup>2</sup>, Ismail A Inamdar<sup>3</sup>, Vijay K Dimple<sup>4</sup>, Madhukar B Nina<sup>5</sup>

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#### Author's Affiliation:

<sup>1</sup>Assist Professor; <sup>2</sup>Prof and Head; <sup>3</sup>Asso Prof, Dept of Community Medicine, Dr. Shankarrao Chavan Government Medical College, Nanded; <sup>4</sup>Asso Prof, Dept of Community Medicine, Govt Medical College, Yeotmal; <sup>5</sup>Post graduate student, Dept of Community Medicine, Dr. Shankarrao Chavan Govt Medical College, Nanded

#### Correspondence

Dr. Ismail A Inamdar  
Ifinamdar123@gmail.com

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## ABSTRACT

**Background:** Lymphatic filariasis (LF) is endemic in 83 countries and territories. In view with the global elimination, mass drug administration (MDA) with single dose of diethyl carbamazine and albendazole tablets was carried out for the eligible population in Nanded district. The study was conducted to assess coverage, compliance and reasons for noncompliance to MDA in Nanded district.

**Method:** A community-based cross-sectional study was done by house-to-house visit in Nanded district. Three rural and one urban clusters of Nanded district, Maharashtra, were selected. A pre-designed questionnaire was used to collect information. Drug coverage, compliance, effective coverage, coverage-compliance gap (CCG), reasons for noncompliance were studied. Statistical analysis was done by SPSS version 16.

**Results:** The total numbers of houses surveyed were 120. Coverage rate was 94.40%, and compliance rate, CCG, effective coverage rate was 51.81%, 8.48%, and 48.91%, respectively. The compliance of drugs by eligible population was slightly higher in urban area (95.41%) than the rural area (90.56%). Major reasons for non consumption of drug were empty stomach during Drug distributor (DD) visit.

**Conclusion:** The drug compliance need to be improved. Issues like fear of side effects should be addressed through effective behavior change communication strategies.

**Key words:** Mass drug administration, Lymphatic filariasis, coverage, compliance

## INTRODUCTION

One of the major public health and socioeconomic problem came across by many developing countries in the world is Lymphatic filariasis (LF).<sup>1</sup> It is endemic in 83 countries. More than a billion people are at risk of infection. Nearly 120 million people are affected worldwide of whom about 40 million with overt disease are in need of treatment. It is one of the world's leading causes of permanent and long-term disability with an estimated 5.1 million disability adjusted life years (DALYs) are lost due to this disease.<sup>2,3</sup>

About 40% of the global filariasis burden is in India. 50% of the world's population is at risk of in-

fection.<sup>4</sup> In India, *Culex quinquefasciatus* is the main vector transmitting about 99.4% of filariasis infections due to *Wuchereria Bancrofti*.<sup>5</sup> The annual mass drug administration (MDA) program to eliminate lymphatic filariasis (PLEF) was implemented in India, in 11 endemic districts in 1997. By 2007 the program has been started in all 250 known endemic districts providing protection to 600 million people making it the largest national public health intervention.<sup>6,7</sup> There have been 9-11 rounds of MDA in all LF endemic districts. There has been decrease of overall microfilaria rate from 1.24% in 2004 to 0.44% in 2014 showing the great achievement of the programme Elimination of lymphatic Filariasis.<sup>8</sup>

Nowadays there is a strategy to administer a once-yearly, single-dose, two-drug regimen (Albendazole with Diethylcarbamazine (DEC)) to interrupt transmission of LF in communities.<sup>9</sup> 65% epidemiological drug coverage is the goal to be achieved for 4–6 years.<sup>10</sup> The objective of MDA is to reduce the level of microfilaraemia in infected individuals so that transmission cannot be sustained, even after MDA has been stopped.<sup>11,12</sup>

## MATERIAL AND METHODS

This is cross-sectional observational study. A semi-structured questionnaire designed by the Department of Health, Government of Maharashtra was used as the study tool. Interview was undertaken in April 2017 by a team of faculty members of the Department of Community Medicine of Dr. Shankarrao Chavan Government Medical College Nanded. As provided in the government protocol the study was conducted in 4 clusters of 30 families each in the district of Nanded.

Since 90% of the population of the district reside in the rural area having high MDA coverage the rural blocks were stratified into high (>95%), medium (85-95%) and low (<85%) reported coverage categories. Then multistage sampling design was adopted. Taluqas with highest, Medium and lowest coverage selected were Kandhar, Loha and Mudkhed respectively. From these taluqas each PHC was selected in second stage. From Kandhar taluqa PHC with highest coverage Panshevadi was selected, Sonkhed PHC from Loha taluqa with intermediate coverage was selected and Mugat PHC with lowest coverage from Mudkhed taluqa was selected. In the third stage from each PHC one subcentre and from that subcentre one village was selected. Then Bahadarpur sub-centre and finally Bahadarpur village was picked up from Panshevadi. Similarly Sonkhed village was picked up from Sonkhed subcentre and Sonkhed PHC. Patharmala village was selected from Mugat subcentre and Mugat PHC. From the urban area out of two areas of Cidco and Taroda, cidco area was selected by lottery method. Out of the total four ward from Cidco, one ward was selected by lottery method. From that ward, 30 houses were selected randomly. The eligible population did not include pregnant and lactating women, children below two years of age and seriously ill persons. Informed consent in form of oral consent was obtained from the participants Each of these four clusters was surveyed. Standing at the centre of the cluster the paths were numbered. Two paths were selected randomly for house to house visit by two surveyors. Then the first house was chosen randomly (Government of India, 1990). All the 30 houses were covered. Head of the family or any other fam-

ily member who had knowledge about family were interviewed. For instance, if the house was locked then the adjacent house was selected. So, a total of 120 houses were surveyed from the four clusters.

**Statistical analysis:** The data obtained was entered in excel sheet and analyzed using Statistical Package for the Social Sciences (SPSS), version 16.

The working definitions adopted for drug coverage and drug compliance as per NVBDCP guidelines are as follows:<sup>11</sup>

**Drug coverage:** 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 and is expressed as percentage.

**Drug compliance:** It is the number of persons who ingested DEC in presence of a 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 and is expressed as percentage.

**Coverage-Compliance Gap (CCG):** It refers to the people who got the drug but did not consume due to various reasons. It is calculated as the total number of persons who did not consumed the drug divided by the eligible population of the area and is expressed in percentage.

**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 in presence of DD/Total people eligible for receiving the DEC tablets × 100).

## RESULTS

Nanded district was selected as the study area. This district is one of the 14 endemic districts of Maharashtra. As per the 2011 census, the total population of the district was 33,61,292 out of which 24,47,394 was rural population and 9,13,898 is urban. Four clusters, including one from urban and three from rural areas, were studied.

A total 120 households (90 rural and 30 urban) were surveyed, yielding a population of 578. Of 578 individuals, 554 were found to be eligible for drug administration (95.84%).

Compliance rate, CCG, and effective coverage rate are shown in Table 2. Of 554 eligible persons, 523 received DEC by a DD. Overall coverage rate of study population was found to be 94.40%.

**Table 1: Distribution of surveyed population**

Name of area	Total Population	Population surveyed	Eligible population
Patharmala	1304	146	140
Bahadarpur	4264	151	149
Sonkhed	5995	167	156
Cidco	5624	114	109
Total	17187	578	554

Effective coverage rate was marginally higher in urban area than rural areas, but no significant difference was found ( $p>0.05$ ). Drug compliance also

not found to be significantly different in urban areas and the rural areas.

Of 554, 523 (94.40%) persons received the drug. Of them 507 (91.51%) consumed the drug. The remaining ( $n = 47$ ), although eligible, did not consume the drug for various reasons as shown in Table 4. The most common reason found was empty stomach at the time of visit of DD. The drug was perceived hot (fear of drug), so not consumed by many. Other reasons for nonconsumption were DD visited households when almost all family members went to the farms.

**Table 2: Compliance of M.D.A in study area**

Area	Coverage (%)	Consumption (%)	Compliance (%)	Coverage compliance gap (%)	Effective coverage (%)
Patharmala	130 (92.85)	121 (86.42)	67 (51.53)	19 (14.61)	<b>47.85</b>
Bahadarpur	142 (95.3)	141 (94.63)	84 (59.15)	8 (5.63)	<b>56.37</b>
Sonkhed	145 (92.94)	141 (90.38)	60 (41.37)	15 (10.34)	<b>38.46</b>
Cidco	106 (97.24)	104 (95.41)	60 (56.6)	5 (4.71)	<b>55.04</b>
Total	523 (94.4)	507 (91.51)	271 (51.81)	47 (8.98)	<b>48.91</b>

**Table no 3. Drug coverage and compliance rate in urban and rural areas:**

Area	Urban (n=109)	Rural (n=445)	Odds ratio	95% CI
Drug consumption in %	95.41	90.56	1.054	0.78-1.42
Drug compliance %	56.60	50.59	1.119	0.43-0.85
Coverage compliance gap %	4.71	10.07	0.468	0.18-1.21
Effective coverage %	55.04	47.41	1.161	0.60-1.2

Note: CI -confidence interval

**Table 4: Reasons for non-consumption of drugs in various study areas\***

Reasons	Rural (n=34) (%)	Urban (n=13) (%)	Total (n=47) (%)
No information about LF/MDA	3 (8.8)	1(7.7)	4 (8.5)
Fear of drugs	15 (44.1)	2(15.4)	17(36.1)
Empty stomach	27 (79.4)	7 (53.8)	34(72.3)
Side effects	9 (26.4)	3(23.1)	12(25.5)
No need	9 (26.4)	1(7.7)	10(21.2)
Absent at the time of drug distribution	10 (29.4)	2 (15.3)	12(25.5)

(\*47 persons who did not consume the drug were included in this analysis. Some of the persons had given multiple responses.)

**DISCUSSION**

The present study revealed coverage rate of 94.40%, which is higher than that reported by another study conducted in Maharashtra by Godale et al.<sup>13</sup> However, the success of elimination mainly depends on the actual consumption or compliance with MDA rather than the MDA coverage. This study revealed that actual MDA compliance was 51.81%. Higher compliance rate was seen in study conducted in Madhya Pradesh by Marathe et al.<sup>14</sup> In our present study significantly higher compli-

ance rate was seen in urban areas than in rural areas. In contrast to our finding Patel et al<sup>15</sup> found a significantly higher compliance in rural areas. The drug distribution was during daytime when the members of the households had been to work. Most of the people were not available at home during the morning hours, so the Drug distributor handed over the tablets to any member of the family for the whole family, thereby reducing the compliance. Thus, there is a definite need to ensure that the Drug distributor meets the person, for which he may visit the home in the evening. Coverage compliance gap (CCG) is a better indicator for assessing the effectiveness of MDA program among program managers. It actually reflects the proportion of covered people not consuming the drugs and explores the possible determinants for non consumption. The present study revealed a Coverage compliance gap of 8.48%. Slightly higher coverage compliance gap was seen in study by Havale et al.<sup>16</sup> The difference might be due to different study setting. The Coverage Compliance Gap may be bridged up by giving enormous stress on Behavior Change Communication (BCC) strategies that aim to motivate the people for drug consumption and stress on supervised dosage. Ideally coverage compliance gap should be zero and every effort should be made by Health Department to

achieve it. Effective coverage is one of the most valuable indicators because it reflects both coverage and compliance. It actually denotes the compliance by the community with respect to the eligible population. The effective coverage (48.81%) was far behind the recommended level ( $\geq 85\%$ ) in the present study. Slightly higher effective coverage rate (52.81%) was seen in study by Jothula et al conducted in Telangana.<sup>17</sup>

In our study the most common reason for nonconsumption of drug in presence of drug distributor was empty stomach at the time of visit of Drug Distributor. Other reasons for nonconsumption were Drug Distributor visited households when almost all family members went to the farms. The drug was perceived hot (fear of drug), so not consumed by many. Nirgude et al. in their study reported fear of side effects of drugs (45.38%) as the most common reason for noncompliance followed by lack of awareness about LF.<sup>18</sup>

## CONCLUSION

The present study reveals the coverage and compliance in the district as 94.40%, & 51.81% respectively which is above the minimum target level and better in Urban areas. The present study and similar studies in the past have shown that elimination of LF is through successful MDA rounds with effective coverage of eligible population should be more than 85%. The drug compliance need to be improved through effective IEC activities. Hence every effort should be made to achieve it so that LF ceases to be a public health problem.

## RECOMMENDATIONS

This evaluation study noted that Mass Drug Administration is restricted to tablet distribution only. Evening visits and follow up should be done to improve compliance. The major issues of implementation in compliance, health education, fear of side-effects, motivation/promotion measures, and community participation should be given attention.

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