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Comparative Evaluation of Coverage - Compliance of Mass Drug Administration and associated factors for noncompliance: A Coverage Evaluation Survey of Lymphatic filariasis endemic Districts of Madhya Pradesh

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ABSTRACT

Background: Mass Drug Administration (MDA) using diethylcarbamazine, ivermectin, and albendazole was a key strategy for interrupting transmission of lymphatic filariasis. Adequate drug distribution and consumption were essential for achieving effective coverage and elimination targets. This study compared mass drug administration coverage and compliance and identified major reasons for non-compliance in endemic districts of Madhya Pradesh.

Methods: A community-based cross-sectional Coverage Evaluation Survey was conducted in selected implementation units of Tikamgarh and Niwari districts of Madhya Pradesh during February-March 2025. Two implementation units from Tikamgarh and one from Niwari were included. One urban ward and three rural villages were selected from each implementation unit. House-to-house visits were conducted, and eligible individuals were interviewed regarding receipt and consumption of mass drug administration medicines. Distribution coverage, compliance, effective coverage, coverage-compliance gap, and reasons for non-compliance were assessed. Data were analysed using descriptive and comparative statistics.

Results: A total of 1,819 individuals were surveyed, of whom 1,743 [95.82%] were eligible for mass drug administration. In Tikamgarh, 1,098 of 1,169 eligible individuals [93.93%] received the medicines, compared with 498 of 574 [86.76%] in Niwari. Drug distribution coverage was significantly higher in Tikamgarh than Niwari [χ^2=25.61, df =1, p-value< 0.001]. Among recipients, 963 [87.70%] in Tikamgarh and 435 [87.35%] in Niwari consumed the medicines, with no significant difference in compliance [χ^2=0.04, df=1, p=0.842]. Effective coverage was significantly higher in Tikamgarh [82.38%]

than Niwari [75.78%] [χ^2=10.54, df=1, p=0.0012]. Among the eligible population, 206 (17.62%) individuals in Tikamgarh and 139 (24.22%) in Niwari did not consume the distributed drugs. Lack of awareness or scientific information was the most frequently reported reason for non-compliance in both districts.

Conclusion: Tikamgarh achieved significantly higher drug distribution and effective coverage than Niwari, while compliance among recipients was comparable between districts. The findings indicated that differences in effective coverage were primarily attributable to drug distribution rather than consumption among recipients. Strengthening interpersonal communication, scientific information, counselling, and community mobilisation could improve drug uptake and support future lymphatic filariasis elimination efforts.

***Keywords*:** Mass drug administration; lymphatic filariasis; effective coverage; Coverage Evaluation Survey; non-compliance.

INTRODUCTION

Lymphatic filariasis (LF) is a mosquito-borne neglected tropical disease caused by filarial nematodes and remains an important public health problem in several tropical and subtropical countries, including India. The disease is associated with substantial long-term morbidity, particularly lymphoedema and hydrocele, which can lead to disability, reduced productivity, social stigma, impaired quality of life, and socioeconomic consequences for affected individuals and their families [1,2]. In India, *Wuchereria bancrofti* is responsible for the majority of infections, while *Brugia malayi* accounts for a smaller proportion of cases. Transmission is maintained by mosquito vectors, resulting in persistent endemicity in affected areas [1,2].

Recognizing the public health burden of LF, the World Health Assembly adopted a resolution in 1997 to eliminate the disease as a public health problem, leading to the establishment of the Global Programme to Eliminate Lymphatic Filariasis. The elimination strategy consists of two major components: interruption of transmission through mass drug administration (MDA) and prevention and management of morbidity among affected individuals [3].

India initiated large-scale MDA in 2004 under the National Programme for Elimination of Lymphatic Filariasis and subsequently adopted combination drug regimens to improve the effectiveness of transmission interruption [4]. The success of MDA depends not only on making medicines available to the eligible population but also on their actual consumption. Distribution coverage represents the proportion of the eligible population that received the recommended medicines, whereas compliance reflects the proportion of individuals who received the medicines and subsequently consumed them. Effective coverage, which incorporates both drug distribution and consumption, provides a more meaningful measure of programme performance [4,12].

Evidence from different endemic settings has demonstrated that high distribution coverage does not necessarily result in high compliance or effective coverage. Studies from Bagalkot and Bidar districts of Karnataka reported gaps between medicine distribution and actual consumption and highlighted the influence of community-related and operational factors on compliance [5,6]. A study from Kalaburgi district also reported challenges related to MDA compliance and identified factors influencing non-compliance [7]. Similarly, evidence from endemic areas of West Bengal highlighted inadequate awareness and concerns regarding adverse effects among factors associated with non-compliance [8]. These findings indicate that achieving high distribution coverage alone may not be sufficient to ensure adequate

drug consumption and effective interruption of LF transmission.

Evidence from Madhya Pradesh has also demonstrated variations in MDA performance. An evaluation conducted in Satna district reported substantial drug distribution and comparatively lower effective coverage, indicating a gap between receipt and consumption of medicines **[9]**. A comparative assessment of Sagar and Damoh districts demonstrated variation in distribution coverage and compliance between the two districts **[10]**. Further evaluation from Rewa district also documented variation in distribution coverage and compliance, emphasizing the importance of locally relevant evidence for strengthening programme implementation **[11]**. In addition, an evaluation conducted in Tikamgarh district of Madhya Pradesh reported variation in distribution coverage and compliance and highlighted the importance of assessing community-level programme performance **[12]**.

Despite these findings, comparative evidence on MDA performance between different lymphatic filariasis - endemic districts of Madhya Pradesh remains limited, particularly regarding the magnitude of the coverage-compliance gap and the reasons for non-compliance. Furthermore, differences in distribution coverage, compliance, and effective coverage between rural and urban populations require further assessment at the community level. Such evidence is important for identifying programme implementation gaps and developing targeted strategies to improve MDA performance.

Therefore, the present study was undertaken to comparatively assess the distribution coverage, compliance, effective coverage, and coverage-compliance gap of MDA in selected lymphatic filariasis endemic districts of Madhya Pradesh and to identify the major reasons for non-compliance among the eligible population.

MATERIALS & METHODS

Study Setting and Duration

The present study was conducted in endemic districts of Tikamgarh and Niwari in Madhya Pradesh as part of Coverage Evaluation Survey (CES) of the Mass Drug Administration programme for elimination of lymphatic filariasis. The MDA campaign was implemented during February-March 2025 by district health authorities with technical support from the State Health Department and the National Centre for Vector Borne Diseases Control (NCVBDC). Under the MDA programme, a fixed-dose combination of diethylcarbamazine (DEC), albendazole, and ivermectin was administered to all eligible individuals residing in endemic areas. Children below two years of age, pregnant women, and severely ill individuals were excluded. Drug distribution was carried out through house-to-house visits by trained drug distributors, including health staff and Integrated Child Development Scheme (ICDS) functionaries, with instructions to consume the drugs preferably on the spot under Directly Observed Treatment (DOT).

Study Design

A community-based cross-sectional study was conducted using standard CES methodology recommended by NCVBDC. The survey was designed to independently assess MDA distribution coverage, compliance, effective coverage, and the coverage-compliance gap.

Sampling Method

Coverage Evaluation Surveys are conducted at the level of the implementation unit (IU), which may correspond to a block, community health centre, primary health centre, or urban municipality. All available implementation units in the two study districts were included in the survey (Jatara and Palera in Tikamgarh district, and Niwari City in Niwari district) because the total number of IUs across both districts was fewer than five.

Within each included IU, three rural sub-centres and one urban ward were selected randomly. From each rural sub-centre, one village was chosen randomly, and from the urban area, one ward was selected, resulting in four clusters per IU. Within each selected village or ward, 30 households were chosen using systematic random sampling, yielding 120 households per IU. If a selected household was locked or unavailable, the immediate next household was surveyed. In total, 360 households were surveyed, comprising 1,819 individuals across the three IUs.

Study Area

The study was conducted in endemic districts of Tikamgarh and Niwari in Madhya Pradesh. In Tikamgarh district, IU Jatara included rural sub-centres Bamhori, Dighora, and Ramnagar with villages Bamhori, Dighora, and Shivrajpur, respectively, and urban Ward No. 02 (Ganj Mohalla). IU Palera included rural sub-centres Simara, Budoar, and Gowa with villages Khargupura, Budoar, and Gowa, respectively, and urban Ward No. 14 (Ravidaspura).

In Niwari district, IU Niwari City included rural sub-centres Kummhara, Tehraka, and Taricharkala with villages Ramnagar, Thona, and Asati, respectively, and urban Ward No. 11 (Niwari Urban). Overall, a total of 360 households were surveyed across both districts.

Data Collection

Data collection was carried out through face-to-face interviews using a structured and pre-tested questionnaire formulated and provided by state Tikamgarh division of Madhya Pradesh. Information was collected on receipt and consumption of MDA drugs, compliance with DOT, and reasons for non-consumption, if any. The questionnaire also captured demographic details and awareness regarding MDA. Enumerators were trained prior to data collection to ensure uniformity and minimize bias. Locked households were documented but excluded from compliance calculations.

Statistical Analysis

The collected data were entered and initially organized in Microsoft Excel and subsequently analysed using Jamovi version 2.3.28. Descriptive statistics were used to summarize the study population and calculate MDA eligibility, distribution coverage, compliance, effective coverage, and the coverage-compliance gap. Categorical variables were presented as frequencies and percentages. Reasons for non-compliance were categorized and summarized using frequencies and percentages. Pearson's Chi-square test was used to compare categorical outcomes between districts and between rural and urban areas. A p-value <0.05 was considered statistically significant.

Distribution coverage was calculated as the proportion of eligible individuals who received MDA drugs, while compliance was calculated among individuals who received the drugs. Effective coverage represented the proportion of the total eligible population who actually consumed the MDA drugs. The coverage compliance gap was calculated as the difference between distribution coverage and effective coverage, representing the proportion of the eligible population that received MDA drugs but did not consume them. Locked households were excluded from the relevant denominator where applicable, as they could not be assessed for receipt or consumption of MDA drugs.

Note: Coverage–compliance gap (%) = Distribution coverage (%) − Effective coverage (%)

RESULT

A total of 1,227 individuals were surveyed in Tikamgarh district, of whom 1,169 [95.27%] were eligible for Mass Drug Administration [MDA]. Eligibility was high in both blocks, with 96.18% in Jatara and

94.40% in Palera. Among the eligible population, 1,098 individuals [93.93%] received the drugs. Block-wise distribution coverage was comparable, at 93.61% in Jatara and 94.24% in Palera.

In Niwari district, 574 out of 592 surveyed individuals [96.96%] were eligible for MDA. However, only 498 eligible individuals [86.76%] received the drugs, indicating lower distribution coverage compared to Tikamgarh district [Table 1]**.**

In Tikamgarh district, out of 1,098 individuals who received the drugs**,** 963 consumed them**,** resulting in an overall compliance rate of 87.70% and an effective coverage of 82.38%**.** Compliance was slightly higher in Jatara [88.93%] compared to Palera [86.51%]**,** while effective coverage was 83.25% in Jatara and 81.53% in Palera**.** The coverage-compliance gap ranged from 10.36% to 12.71% across blocks.

In Niwari district, 435 out of 498 recipients consumed the drugs**,** yielding a compliance rate of 87.35%**.** Despite comparable compliance, the effective coverage was lower [75.78%]**,** with a coverage–compliance gap of 10.98% [Table 2]**.**

In Tikamgarh district, urban areas demonstrated better program performance than rural areas. Urban populations showed higher eligibility [97.10%]**,** higher distribution coverage [99.34%]**,** and greater effective coverage [88.41%] compared to rural areas, which achieved an effective coverage of 80.28%**.** The coverage-compliance gap was marginally higher in rural areas [11.76%] than in urban areas [10.93%] [Table 3]**.**

In Niwari district, drug distribution coverage was significantly higher in rural areas than in urban areas [90.20% vs. 74.40%]. Compliance among recipients was identical between rural [87.41%] and urban areas [87.10%]. Consequently, effective coverage was significantly higher in rural areas than in urban areas [78.84% vs. 64.80%] [Table 4].

In Tikamgarh district, 206 eligible individuals [17.62%] did not consume the drugs. The most frequently reported reason was lack of scientific information or awareness [8.30%]**,** followed by lack of awareness regarding the drug's effect [5.30%]**.** Fear of side effects [2.82%] and fear of consuming many tablets or inadequate counselling [1.20%] were less commonly reported.Each non-compliant participant was classified according to the primary reason reported for non-consumption. [Table 5]**.**

In Niwari district, non-compliance was higher, affecting 139 eligible individuals [24.22%]**.** The predominant reason was lack of awareness or ignorance [13.24%]**,** followed by fear of side effects [4.01%]**,** improper counselling [3.66%]**,** and forgetting or misplacing the drug [3.31%] Each non-compliant participant was classified according to the primary reason reported for non-consumption. [Table 5]**.**

Comparative analysis showed that drug distribution coverage was significantly higher in Tikamgarh district [93.93%] than in Niwari district [86.76%] [$\chi^2 = 25.61$, df = 1, $p < 0.001$]**.** Similarly, effective coverage was significantly greater in Tikamgarh [82.38%] compared to Niwari [75.78%] [$\chi^2 = 10.54$, df =1, $p = 0.0012$]**.** The proportion of eligible individuals who did not receive drugs was significantly higher in Niwari [13.24%] than in Tikamgarh [6.07%] [$\chi^2 = 25.61$, df = 1, $p < 0.001$] [Table 6]**.**

In contrast, compliance among individuals who received the drugs did not differ significantly between the two districts [87.70% in Tikamgarh vs 87.35% in Niwari; $\chi^2 = 0.04$, $p = 0.842$] [Table 6]**.**

Table 1. Population Eligibility and Drug Distribution Coverage by Block and District.

District / Block	Total Population (N)	Eligible Population n/N (%)	Drug Distributed n/N (%)
Tikamgarh – Jatara	602	579/602 (96.18)	542/579 (93.61)
Tikamgarh – Palera	625	590/625 (94.40)	556/590 (94.24)
Tikamgarh – Total	1227	1169/1227 (95.27)	1098/1169 (93.93)
Niwari – Total	592	574/592 (96.96)	498/574 (86.76)
χ^2 (Jatara vs Palera)	-	2.156	0.202
df	-	1	1
P-value	-	0.142	0.653

Table 1. Presents the MDA eligibility and drug distribution coverage across Tikamgarh (Jatara and Palera blocks) and Niwari districts. Overall eligibility reached 95.27% (1169/1227) in Tikamgarh and 96.96% (574/592) in Niwari. Among eligible individuals, drug distribution coverage was 93.93% (1098/1169) in Tikamgarh and 86.76% (498/574) in Niwari. A block-wise comparison between Jatara and Palera revealed no statistically significant differences in eligibility (χ^2 = 2.156, df = 1, p = 0.142) or drug distribution coverage (χ^2 = 0.202, df = 1, p = 0.653).

Table 2. Coverage, Compliance, Coverage-Compliance Gap and Effective Coverage by Block.

District / Block	Eligible Population (N)	Received MDA drugs, n/N (%)	Consumed MDA drugs, n/N (%)	Compliance among recipients (%)	Coverage–Compliance Gap (%)	Effective Coverage (%)
Tikamgarh - Jatara	579	542/579(93.61)	482/542 (88.93%)	482/542 (88.93%)	10.36	482/579 (83.25%)
Tikamgarh - Palera	590	556/590 (94.24%)	481/556 (86.51%)	481/556 (86.51%)	12.71	481/590 (81.53%)
Tikamgarh - Total	1169	1098/1169 (93.93%)	963/1098 (87.70%)	963/1098 (87.70%)	11.55	963/1169 (82.38%)
Niwari - Total	574	498/574 (86.76%)	435/498 (87.35%)	435/498 (87.35%)	10.98	435/574 (75.78%)
χ^2 (Jatara vs Palera)	-	0.202	-	1.49	-	0.60
df	-	1	-	1	-	1
p-value	-	0.653	-	0.222	-	0.440

Table 2. Details the coverage, compliance, coverage–compliance gap, and effective coverage across the evaluated blocks. Overall compliance among drug recipients was 87.70% (963/1098) in Tikamgarh and 87.35% (435/498) in Niwari, yielding effective coverages of 82.38% (963/1169) and 75.78% (435/574), respectively. The coverage-compliance gap was 11.55% in Tikamgarh and 10.98% in Niwari. A block-wise comparison between Jatara and Palera showed no statistically significant differences in compliance (χ^2 = 1.49, df = 1, p = 0.222) or effective coverage (χ^2 = 0.60, df = 1, p = 0.440).

Table 3. Urban–Rural Comparison of Coverage, Compliance and Effective Coverage.

Indicator	Urban N (%)	Rural N (%)	Total	χ^2	df	p-value
Total surveyed population, (N)	311	916	1227	-	-	-
Eligible population, N (%)	302 (97.10)	867 (94.65)	1169 (95.27)	-	-	-
Drug distribution coverage, n/N (%)	300/302 (99.34%)	798/867 (92.04%)	1098/1169 (93.93%)	20.901	1	<0.001
Compliance among recipients, n/N (%)	267/300 (89.00%)	696/798 (87.22%)	963/1098 (87.70%)	0.642	1	=0.423
Effective Coverage, n/N (%)	267/302 (88.41%)	696/867 (80.28%)	963/1169 (82.38%)	10.208	1	=0.001

Table 3 presents the urban-rural comparison of MDA coverage, compliance, and effective coverage among the surveyed and eligible population in Tikamgarh district. Of the 1,227 individuals surveyed, 1,169 (95.27%) were eligible for MDA. Drug distribution coverage was significantly higher in the urban population than in the rural population (99.34% vs. 92.04%; χ^2=20.901, df=1, p<0.001). Compliance among those who received the drugs was comparable between urban and rural areas (89.00% vs. 87.22%; χ^2=0.642, df = 1, p=0.423), with no statistically significant difference. However, effective coverage was significantly higher in urban areas than in rural areas (88.41% vs. 80.28%; χ^2=10.208, df = 1, p = 0.001). Overall, the district recorded 93.93% coverage, 87.70% compliance, and 82.38% effective coverage.

Table 4. Urban–Rural Comparison of Coverage, Compliance and Effective Coverage among the Total Surveyed and Eligible Population in Niwari District.

Indicator	Urban N (%)	Rural N (%)	Total	χ^2	df	p-value
Total surveyed population, (N)	**125**	**467**	**592**	-	-	-
Eligible population, N (%)	125/125 (100.00%)	449/467 (96.15%)	574/592 (96.96%)	-	-	-
Drug distribution coverage, n/N (%)	93/125 (74.40%)	405/449 (90.20%)	498/574 (86.76%)	21.25	1	< 0.001
Compliance among recipients, n/N (%)	81/93 (87.10%)	354/405 (87.41%)	435/498 (87.35%)	0.006	1	= 0.935
Effective Coverage, n/N (%)	81/125 (64.80%)	354/449 (78.84%)	435/574 (75.78%)	10.51	1	= 0.001

Table 4 describes the urban-rural comparison of MDA coverage, compliance, and effective coverage in Niwari district. Among the 592 individuals surveyed, 574 (96.96%) were eligible for MDA. Drug distribution coverage was significantly higher in rural areas than in urban areas (90.20% vs. 74.40%; χ^2=21.25, df = 1, p<0.001). Compliance among those who received the drugs was almost identical in urban and rural areas (87.10% vs. 87.41%; χ^2=0.006, df = 1, p=0.935), indicating no statistically significant difference. However, effective coverage was significantly higher in rural areas than in urban areas (78.84% vs. 64.80%; χ^2=10.51, df = 1, p=0.001). Overall, Niwari district recorded 86.76% drug distribution coverage, 87.35% compliance, and 75.78% effective coverage.

Table 5. Reasons for Non-Compliance among Eligible Population.

Reason for Non-Compliance	Tikamgarh N (%)	Niwari N (%)
Lack of scientific information / awareness	97 (8.30)	76 (13.24)
Lack of awareness about drug effect	62 (5.30)	-
Forgot / misplaced drug	-	19 (3.31)
Fear of side effects	33 (2.82)	23 (4.01)
Fear of many tablets / improper counselling	14 (1.20)	21 (3.66)
Total Non-compliance	**206 (17.62)**	**139 (24.22)**

$\chi^2 = 16.16$, df = 3, $p < 0.001$

The distribution of reported reasons for non-compliance was higher in Niwari [24.22%] than in Tikamgarh [17.62%]**.** In both districts, the main reason for non-compliance was lack of awareness or scientific information, followed by fear of side effects and inadequate counselling**,** indicating the need to strengthen IEC/BCC and interpersonal communication during MDA (table 5).

Table 6. District-wise Comparison of Drug Distribution, Compliance and Effective Coverage.

Parameter	Tikamgarh District	Niwari District	χ^2	df	(p-value)
Eligible population (N)	1169	574	-	-	-
Drug distribution coverage, n/N (%)	1098 /1169 (93.93%)	498/574 (86.76%)	25.61	1	<0.001 (Significant)
Drug not received, n (%)	71 (6.07%)	76 (13.24%)	25.61	1	<0.001 (Significant)
Effective coverage, n/N (%)	963/1169 (82.38%)	435/574 (75.78%)	10.54	1	=0.0012 (Significant)
Compliance among recipients (%)	963/1098 (87.70%)	435/498 (87.35%)	0.04	1	0.842(Not significant)

Tikamgarh district had significantly higher drug distribution [1098; 93.93%] and effective coverage [963/1169; 82.38%] compared to Niwari district [498/574; 86.76%] and [435/574; 75.78%]**,** respectively **(χ^2 = 25.61 and 10.54; $p < 0.001$, $p = 0.0012$; df =1, df=1)** [table 6]. Non-receipt of drugs was significantly higher in Niwari [76; 13.24%] than in Tikamgarh [71; 6.07%] **(χ^2 = 25.61; $p < 0.001$)**. In contrast, compliance among recipients was similar in both districts [87.70% vs 87.35%; χ^2 = 0.04, df =1, p = 0.842], indicating that differences were mainly due to distribution coverage rather than compliance.

DISCUSSION

An earlier study conducted in Tikamgarh district by Panika and Sahu reported 94.6% distribution coverage, 89.9% compliance, and 85.2% effective coverage, which was close to the programme target of 85% **[12]**. In the present evaluation of Jatara and Palera blocks, distribution coverage was 94.0% (1098/1169), with 87.70% compliance and an overall effective coverage of 82.38%. Effective coverage was 83.25% in Jatara and 81.53% in Palera, both of which were below the programme target of ≥85% effective coverage in India. Therefore, although distribution coverage and compliance were satisfactory in the present evaluation, effective coverage was lower than that reported in the earlier Tikamgarh study. This difference may be associated with variations in MDA rounds, geographical areas covered, community participation, awareness, drug acceptance, supervision, and implementation practices. The findings emphasize the importance of continued monitoring of drug distribution and actual consumption at the local level to identify coverage-compliance gaps and strengthen subsequent MDA rounds **[12]**.

However, when assessed against the programme target of ≥85% effective coverage in India, the programme performance showed important gaps. In Tikamgarh district, although distribution

coverage was high, effective coverage reached only 82.38%, falling below the 85% national target threshold required to interrupt transmission. This shortfall was reflected in the observed coverage–compliance gap, highlighting that drug distribution alone does not ensure epidemiologically effective coverage. World Health Organization (WHO) guidelines clearly state that minimizing this gap is essential for achieving elimination targets during MDA campaigns **[13]**.

These low-coverage pockets are programmatically concerning because persistent gaps in drug consumption may allow continued transmission and delay progress towards elimination at the district level. Similar differences in coverage between urban and rural areas and implementation units reported by Ghosh S. who emphasized that even small areas of poor coverage can compromise overall programme impact **[8]**.

Urban-rural differences further influenced progress toward the national benchmark. In Tikamgarh, urban areas achieved effective coverage above or close to the programme target of ≥85% effective coverage in India (88.41%), whereas rural areas remained below the threshold (80.28%). The observed urban-rural difference may reflect differences in access to health information, programme implementation, supervision, and community engagement; however, these factors were not directly assessed in the present evaluation. Alwala RR similarly reported that rural operational challenges can limit effective coverage despite adequate drug availability **[14]**.

In Niwari district, although compliance among drug recipients was satisfactory (87.35%), overall effective coverage remained well below the programme target of ≥85% effective coverage in India at 75.78%, primarily due to lower distribution coverage. This finding underscores that high compliance cannot compensate for missed households or incomplete population reach. Babu and Kar have highlighted that weaknesses in drug delivery and mop-up activities are major barriers to achieving national target effective coverage in endemic areas **[15]**.

Observations by Krentel et al. emphasized that universal coverage of all eligible individuals is essential, as high compliance alone is insufficient to meet elimination thresholds **[16]**.

Across both districts, non-compliance was mainly driven by lack of awareness, fear of side effects, and inadequate counselling, indicating gaps in Information, Education and Communication (IEC) and Behaviour Change Communication (BCC) activities. The Ministry of Health and Family Welfare (MoHFW) and WHO both stress that strengthening IEC/BCC and interpersonal communication is critical for achieving and sustaining the programme target of ≥85% effective coverage in India, which is required for elimination **[17]**.

Overall, while Tikamgarh and Niwari districts have demonstrated strong performance in eligibility and distribution coverage, failure to consistently achieve the programme target of ≥85% effective coverage in India highlights the need for targeted operational improvements. Strengthening IEC/BCC activities, improving training and supervision of drug distributors, and implementing focused micro-planning for low-performing villages are essential to close coverage-compliance gaps. WHO guidelines emphasize the importance of achieving adequate epidemiological coverage through repeated MDA rounds to interrupt LF transmission **[18]**.

Limitations

This study was conducted in selected villages of Tikamgarh (Blocks Jatara and Palera) and Niwari districts, which may limit the generalizability of its findings to other endemic areas in India with different socio-demographic and operational contexts. The evaluation primarily relied on household surveys and reported drug

ingestion to assess compliance, which may introduce recall or social desirability bias. While effective coverage was calculated, the study did not measure the long-term impact on lymphatic filariasis transmission or disease prevalence. Operational factors such as seasonal migration, absenteeism during MDA, and variations in drug distributor performance were not systematically quantified. Additionally, reasons for non-compliance were self-reported by participants and may not fully capture all behavioural or cultural determinants affecting drug uptake. The study also did not assess the impact of concurrent health interventions or awareness campaigns, which could influence compliance and coverage outcomes. Because the survey used a cluster-based sampling design, clustering of observations was not incorporated into the inferential analysis. Failure to account for intra-cluster correlation may have affected the precision of the statistical estimates; therefore, the inferential findings should be interpreted with caution.

CONCLUSION

The Mass Drug Administration programme in Tikamgarh and Niwari districts demonstrated high eligibility and satisfactory distribution coverage, with overall effective coverage sufficient to indicate substantial community participation. However, coverage-compliance gaps and differences in coverage between urban and rural areas and implementation units highlight the need for strengthened IEC/BCC activities, enhanced training and supervision of drug distributors, and focused micro-planning for low-performing areas. Urban-rural differences emphasize that tailored strategies are required to reach dispersed or hard-to-reach populations effectively. The findings suggest that while MDA programmes are operationally successful in many areas, sustained attention to behavioral, logistical, and communication challenges is critical to achieving elimination targets. Future studies with broader geographic scope and longitudinal follow-up are recommended to evaluate the long-term impact on lymphatic filariasis transmission and the effectiveness of targeted interventions to improve compliance.

Declaration by Authors.

Ethical Approval: The survey was conducted as part of the programme-based MDA Coverage Evaluation Survey under the National Programme for Elimination of Lymphatic Filariasis. Institutional Ethics Committee approval was not required as per the applicable programme evaluation provisions. Verbal informed consent was obtained from participants before interview.

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