Mass drug administration for lymphatic filariasis elimination amidst COVID-19 pandemic in Odisha, India: A step towards achieving SDG-3

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Abstract
Sustainable Development Goal-3 (SDG) aims to eliminate lymphatic filariasis by 2030 through >65% coverage and compliance of mass drug administration (MDA), the preventive chemotherapy strategy of delivering anthelminthic drugs. However, the ongoing COVID-19 pandemic has disrupted such programmes, yet MDA was administered during February 2021 in Odisha, India. We aimed to assess the coverage and compliance of the present round of MDA amidst the pandemic and explore factors for non-compliance in Cuttack district of Odisha, a filariasis endemic area. Community-based participants enrolled through multistage stratified sampling were administered a semi-structured questionnaire following COVID-19 protocols. The coverage of MDA was 93.2% whereas consumption was 73.7%. Participants reported that healthcare workers were motivated and satisfactorily explained the benefits of MDA but still fear of side-effects was the major cause of non-compliance. Nonetheless, this recent round of MDA was effective, despite challenges posed by the ongoing pandemic.

Keywords
compliance, coverage, COVID-19, lymphatic filariasis, mass drug administration, Odisha

Introduction
Lymphatic filariasis (LF) is a major public health concern in India, often seen among the extreme poor presenting a complex social, economic and healthcare challenge.¹ LF commonly affects marginalized communities with a lack of basic sanitation facilities.² It significantly contributes to disability adjusted life years (DALYs) further leading to economic loss.³ Considering LF as a serious impediment for overall development, India focused on its control since 1955 through its National Filaria Control Programme and subsequently several revised versions. Yet, indigenous cases are prevalent in >257 districts affecting >23 million people.⁴ MDA along with morbidity management and disability prevention have been key strategies for elimination of LF. MDA aims to interrupt transmission through an annual single dose of albendazole with diethylcarbamazine citrate (DEC) to all persons living in endemic areas.⁵ This reduces the density of parasites circulating in the blood of infected persons and thus, decreasing community prevalence to such low levels that further transmission cannot be sustained.⁵

Global elimination of LF was initially targeted for 2020, then by 2021 and has recently been extended to 2030, which still seems a daunting target.⁶ To achieve elimination of Neglected Tropical Diseases by 2030 through Sustainable Development Goal-3, >65% of the population needs to be covered by and compliant to MDA.⁷,⁸ The COVID-19 pandemic has led to a halt of wide-reaching programmes.⁹ The World Health Organization (WHO) has also advised to postpone NTD surveys.¹⁰-¹² Nonetheless, MDA was administered in Cuttack district, India a highly endemic region for
LF in February 2021, and our study seeks to generate evidence on its coverage and compliance.

**Materials and methods**

Our cross-sectional study was conducted in the Cuttack district of Odisha covering a representative population aged two years and above. Pregnant ladies and severely ill patients were excluded from the survey. Based on the geographical location, five out of 14 blocks of Cuttack district namely Bentkar in the centre, Bindhanima in the west, Salepur in the east, Tangi in the north and Niali in the south were selected randomly. Further, two villages were randomly selected from each block with an equal proportion of participants following multistage random sampling. Using direction based systematic random sampling, every fifth household was surveyed from the centre of the village. All eligible members of the household were included in the study. If any respondent was absent on the day of survey, they were not subsequently interviewed. For children who could not answer, available family members aware of their drug consumption status responded.

The required sample size was calculated considering the previous MDA compliance to be 76% with an absolute precision of 5% at 95% confidence interval. A design effect of 1.5 and a non-response rate of 10% was added, making a needed sample size of 464, hence a total of 470 participants were enrolled for this study. Data were collected in March-April, 2021 just a month after the recent MDA administration thus reducing recall bias. A pre-validated questionnaire containing open and closed-ended questions on socio-demographic variables, number of tablets received, drugs consumed, side reactions experienced; prior information about filariasis and MDA, and the reasons for compliance or non-compliance was administered to the participants. Data were analyzed using STATA.

![Figure 1. Coverage and compliance of MDA drugs across (a) age groups; (b) gender.](#)
January-February 2021, whereas compliance was de-
lation who received MDA drugs distributed in
such side-effects. reported, the main reason for non-compliance was fear of
ance varied widely. Although, few side effects were
small portion of respondents did not receive drugs, compli-
compliance of MDA drugs in the community. While a
Our study observed a high coverage but relatively lower
coverage and compliance were calculated as percentage and graphical dis-
Mean and SD were the measures of central
tendency for continuous variables.

Coverage was defined as the percentage of eligible popu-
lation who received MDA drugs distributed in
January-February 2021, whereas compliance was defined as
the percentage of population who self-reported drug con-
sumption among those who received the drugs.

Ethical clearance was obtained from human ethics com-
mittee of ICMR-Regional Medical Research Centre,
Bhubaneswar. Prior written informed consent was obtained
from all study participants.

**Results**

Out of total 470 participants enrolled in our study, 249
(53.0%) were male. The mean age of respondents was 36.8
(2–92) years. The total coverage of MDA drugs was 93.2%
which varied from 81–100% across different blocks. The
coverage and compliance of MDA drugs across various age
groups and gender is depicted in Figure 1. The highest cover-
age (97.8%) was observed amongst participants aged 2–18
years who showed least compliance (63.6%) to drugs
(Figure 1(a)). Males had a better compliance (74.6%) than
their female counterparts (Figure 1(b)). A portion of respon-
dents (6.8%) reported that they did not receive drugs.
Amongst those who did, 73.7% told that they had consumed
them. The drug compliance varied from as low as 27% to as
high as 91% across different blocks. The total respondents
who did not consume medicines included: (a) eligible but
medicines not given 32/470 (6.81%) and (b) medicines
given but not consumed in 115/438 (26.3%). Only one
person reported headache as a side effect of the MDA
drugs, which was managed at the nearby facility. Almost
coverage from as low as 27% to as
high as 91% across different blocks. The total respondents
who did not consume medicines included: (a) eligible but
medicines not given 32/470 (6.81%) and (b) medicines
given but not consumed in 115/438 (26.3%). Only one
person reported headache as a side effect of the MDA
drugs, which was managed at the nearby facility. Almost
all participants who complied with the drugs (87.3%),
reported that healthcare workers were motivated and satisfac-
torily explained the benefits of MDA. The major reasons for
non-compliance of drugs were fear of side effects (67.8%),
not suffering from filariasis (15.1%), taking other medications
(8.6%), not trusting publicly available free drugs (3.3%),
being a small child unable to swallow tablets (1.3%) and
other reasons (4%).

**Discussion**

Our study observed a high coverage but relatively lower
compliance of MDA drugs in the community. While a
small portion of respondents did not receive drugs, compli-
ance varied widely. Although, few side effects were
reported, the main reason for non-compliance was fear of
such side-effects.

We observed a significantly high coverage of MDA
drugs with regard to the required coverage rate of >65%
for elimination of LF.7,8 Despite a lack of human resources
and having to follow Covid19 protocols significant cover-
age was achieved. However, lesser compliance was
reported as compared to coverage. A major drawback con-
tributing to non-compliance was the lack of supervised con-
sumption, aggravated by social-distancing norms during the
pandemic.

The WHO strategy to eliminate lymphatic filariasis
(GPELF), launched in 2000, is based on two major key com-
ponents: halting the infection spread through mass scale
annual treatment of all eligible individuals in endemic
areas and morbidity management of lymphatic filariasis
cases through a recommended package of care.14 WHO
reports of 81 countries which were endemic for LF at the
start of GPELF, >10 no longer require MDA. The at-risk
population requiring MDA has reduced by 43% from
2000 to 2019. However, even after a broad decline in the
global LF prevalence, focal areas of south-east Asia could
not attain the desired threshold to achieve elimination.15

Following the recommendations of WHO, India adopted
the proposed two key strategies to combat LF. India
achieved around 87% coverage of MDA in 2019 as com-
pared to 72% in 2004 (the initial years of MDA in
India).16 In 2018, an accelerated plan was launched which
included triple drug therapy provided in 21 districts in the
year 2020.16 The findings suggest a need for supervised
consumption of drugs, which can be achieved with the
help of frontline workers. This will support in increasing
compliance of MDA. Frontline workers need to be moti-
vated to achieve maximum compliance. Furthermore, infor-
mation education and communication (IEC) campaigns
need to be strengthened so as to gain people’s trust in pub-
licity distributed medicines.

**Authors contributions**

PKS and SP conceived the study. AS, SM1, SM2 and PKS col-
lected data and drafted manuscript. AS and PKS did the statistical
analysis. SP edited manuscript and provided overall guidance
and support.

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**Ethical approval**

Ethical clearance was obtained from ICMR-RMRC,
Bhubaneswar. Prior written informed consent was taken from all
study participants. This is an observational study and hence,
minimum participant risk is involved.
Data availability
The data underlying this article will be shared on reasonable request to the corresponding author.

Declaration of Conflicting Interests
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