

FILARIASIS DISTRIBUTION AND COVERAGE OF MASS DRUG ADMINISTRATION

Distribusi Kasus Filariasis dan Cakupan Pemberian Obat Pencegahan Massal

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ABSTRACT

Background: Filariasis is still a serious health problem in Indonesia. One of the endemic areas is Demak, which implemented a mass drug administration (MDA) elimination programme in 2016. However, filariasis was still found in 2017–18. **Purpose:** This research aims to describe the distribution of filariasis and coverage of filariasis MDA in Demak. **Method:** A case series based on people, time, and place was used as the design of this research. The research was conducted in May–June 2019 using secondary data obtained from the Health Office of Demak based on the results of the MDA programme in the community. The target population of this research comprised residents of Demak from 2016 to 2018. The variables researched were filariasis cases based on gender, age, region, year of MDA implementation, and MDA coverage, which were described based on univariate and spatial analysis. **Result:** There were 23 filariasis cases in Demak during 2016–18, most of which occurred in the age group 46–60 (39.10%) and in women (60.90%); they occurred in almost all subdistricts of Demak. The MDA coverage of filariasis has reached the target (>85%), but there is one particular area that has decreased MDA coverage where some cases are found each year. **Conclusion:** Provision of MDA was carried out in 2016–18 but cases of filariasis are still being reported; also, one of these areas has been decreasing its MDA coverage every year.

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ABSTRAK

Latar Belakang: Filariasis masih menjadi masalah kesehatan yang serius di Indonesia. Demak adalah salah satu daerah endemis dan telah melaksanakan program eliminasi yaitu Pemberian Obat Pencegahan Massal (POPM) yang dimulai pada tahun 2016, namun masih ditemukan kasus filariasis pada tahun 2017-2018. **Tujuan:** Penelitian ini bertujuan untuk mendeskripsikan distribusi kasus filariasis dan cakupan Pemberian Obat Pencegahan Massal

(POPm) Filariasis di Demak. **Metode:** Desain penelitian ini adalah case series berdasarkan pendekatan orang, waktu dan tempat. Penelitian dilakukan pada bulan Mei-Juni tahun 2019 menggunakan data sekunder berupa data kasus filariasis dan cakupan POPm yang diperoleh dari Dinas Kesehatan Kabupaten Demak berdasarkan hasil pelaksanaan program dimasyarakat. Populasi pada penelitian ini adalah penduduk di Kabupaten Demak pada tahun 2016 hingga 2018. Variabel yang diteliti adalah kasus filariasis berdasarkan jenis kelamin, umur, wilayah, tahun pelaksanaan POPm dan cakupan POPm yang dideskripsikan berdasarkan analisis univariat dan analisis spasial. **Hasil:** Kasus filariasis di Demak selama tahun 2016-2018 adalah 23 kasus yang sebagian besar terjadi pada kelompok usia 46-60 tahun (39,10%), terjadi pada wanita (60,90%) dan persebaran kasus filariasis terjadi di hampir seluruh wilayah kecamatan di Demak. Cakupan POPm Filariasis di Demak telah mencapai target (> 85%), tetapi terdapat satu daerah yang memiliki cakupan POPm selalu menurun bahkan ditemukan beberapa kasus setiap tahunnya. **Kesimpulan:** Pemberian Obat Pencegahan Massal telah dilaksanakan pada tahun 2016-2018 dan masih dilaporkan adanya kasus filariasis serta salah satu wilayah tersebut memiliki cakupan POPm filariasis yang selalu menurun setiap tahunnya.

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INTRODUCTION

Filariasis or elephantiasis disease is caused by microfilaria transmitted through mosquito vector. Signs and symptoms of this disease include acute and chronic clinical symptoms. Acute clinical symptoms are lymphadenitis, lymphangitis, and adenolymphangitis, accompanied by fever, headache, weakness and abscess. The chronic clinical symptoms are lymphedema, lymph scrotum, kiluria, and hydrocele. This disease is chronic and can cause disabilities if not treated correctly (Ministry of Health RI, 2015). Disabilities can be permanent, causing trauma to patients, especially psychological and sociological trauma, and economic loss because patients will experience a decrease in their productivity level (Tyagi, 2018).

The World Health Organization (WHO) states that there are currently 856 million people in 52 countries around the world who are at risk for contracting filariasis, and 60% of these cases are in Southeast Asia. Indonesia has 514 districts, 236 of which are endemic areas for filariasis. There were 12,677 chronic filariasis cases in Indonesia in 2017 and the prevalence of microfilaria in 2014 was 4.70% (Ministry of Health RI, 2018).

In 2000, WHO launched the Global Programme to Eliminate Lymphatic Filariasis, with the aim of reducing cases to the point where filariasis would no longer be a health problem by 2020. The Indonesian Ministry of Health followed up with several regulations and ministerial decrees related to the filariasis elimination programme, one of which is the PMK No. 94 of 2014 concerning the Prevention of Filariasis (Meliyanie & Andiarsa, 2017).

Filariasis elimination in Indonesia began in 1975, starting in the endemic areas. A district is declared filariasis endemic if the number of microfilaria in the area is 1% or more. When this happens, mass drug administration (MDA) is carried out for at least five consecutive years. The drugs given to the target community (2–70 age group) in the MDA programme are Diethyl Carbamazine Citrate (DEC) and Albendazole. The dose given is adjusted for the recipients' age. For DEC, children aged 2–5 years are given one tablet; children aged 6–14 years are given two tablets; and people aged 15–70 years are given as many as three tablets. Each tablet weighs 100 mg. The dose of the Albendazole drug is 400 mg (Ministry of Health RI, 2015). The coverage of treatment has a minimum requirement of 85% of the target population and 65% of the total population for five consecutive years and two further years must be

added if the evaluation results show that there is still transmission in the area. MDA will be stopped for two years if there is no transmission, and a repeat survey is conducted. In 2017, out of 236 districts that were filariasis endemic, 84 districts were in the post-MDA surveillance phase and 152 districts were still carrying out MDA (Ministry of Health RI, 2018).

Filariasis was first discovered in Demak in 1995 and up to 2018 the number of new cases found cumulatively was 46 cases. Based on the results of the microfilaria rate (Mfrate) examination conducted by the Indonesian Ministry of Health in 2014, Demak was known to have an Mfrate of $> 1\%$; therefore it was included in filariasis endemic areas and required MDA (Nurjazuli, Dangiran, & Bari'ah, 2018). Filariasis cases have not been fully resolved since the discovery of the first case up until now. This is because filariasis cases continue to be found every year. The MDA of filariasis in Demak District began in 2016 and still has to be carried out every year for five consecutive years. The MDA of filariasis up until 2018 has run three times, but there are still new cases of filariasis occurring, amounting to 14 cases in 2016, six cases in 2017, and three cases in 2018. Based on these facts, research is needed to find out the distribution of filariasis cases and the coverage of MDA in Demak during 2016–18.

METHODS

This research is a descriptive case series study based on people, time, and place. The research was conducted in May–June 2019 in Demak District. The population of this research comprised residents of Demak Regency from 2016 to 2018: 1,190,140, 1,214,582, and 1,219,705 people, respectively. Secondary data, in the form of filariasis cases data and MDA coverage implemented in the community, were obtained from the Demak District Health Office. This research did not use individual samples directly, but only analysed secondary data obtained from programme administrators at the Health Office of Demak District.

The variables in this research consisted of filariasis cases based on sex, age, area, and MDA coverage. The cases were clinical filariasis sufferers recorded in the data of the Health Office of Demak District during 2016–18. The sex variable was grouped into male and female. The age variable was grouped into five groups, namely ≤ 14 years, 15–30 years, 31–45 years, 46–60 years,

and ≥ 60 years, while the age variable on MDA coverage was categorised into three age groups, which were 2–5 years, 6–14 years, and 15–70 years. The area was a sub district of Demak where filariasis cases have been found. MDA coverage was determined by calculating the number of people taking the drug divided by the number of people in the target population (Ministry of Health RI, 2014).

The researcher describes filariasis cases and MDA coverage by using distribution and frequency with univariate analysis. Spatial analysis was carried out to determine the distribution of cases of filariasis based on subdistricts in Demak. Both analyses were carried out using computer software.

RESULTS

Filariasis Cases: Distribution Based on People, Time, and Place

Filariasis cases in Demak during 2016–18 mostly occurred in females and distribution based on age group was most found in the age group 40–60 years. It was not found in the age group ≤ 14 years. The highest number of filariasis cases occurred in 2016 and it continued to decline until 2018 (Table 1).

Table 1
Filariasis Cases: Distribution by Person and Time in Demak in 2016 – 2018

Variables	Cases (Year)			Total	
	2016	2017	2018	n	%
Sex					
Male	5	3	1	9	39,10
Female	9	3	2	14	60,90
Age (Year)					
≤ 14	0	0	0	0	0,00
15-30	2	3	1	6	26,10
31-45	4	1	1	6	26,10
46-60	7	2	0	9	39,10
≥ 61	1	0	1	2	8,70
Total	14	6	3	23	100,00

From 2016 to 2018, 23 new cases of filariasis were found. These cases were mostly found close to the North Coast of Java Island because the area has a greater potential to be affected by flooding due to tidal sea water and basin water flows that in general will result in puddles and bushes — an ideal habitat for the filariasis vector mosquitoes. The subdistrict that has the most cases, as many as seven cases, is Bonang Subdistrict, which directly

borders the North Coast of Java Island. The cumulative number of filariasis cases found during MDA implementation is 46 cases. Five subdistricts from 2016 to 2018 had no cases of filariasis — namely, Mijen, Gajah, Wonosalam, Kebonagung, and Mranggen (Figure 1).

Filariasis MDA Coverage Based on Age Group

The coverage of filariasis MDA in Demak based on age group fluctuates. In the age groups 2–5 years and 6–14 years, the highest percentage is compared to the age group 15–70 years (Figure 2).

Filariasis MDA Coverage and Filariasis Cases

Filariasis MDA coverage in Demak for the three years 2016 to 2018 fluctuated, but during the implementation of MDA it met the target of >85%. The coverage is calculated based on the number of people in the general population in Demak taking the medicine compared to the number taking it in the target population. The number of people taking the medicine in 2016 in Demak was 981,207 people from a target number of 1,082,827 people; in 2017 the number of people taking medicine was 961,339 people from a target number of 1.080.197 people; and in 2018 the number of people taking the medicine was 978,850 people from a target number of 1,071,005 people. Filariasis MDA coverage of several community health centres shows that the results always increase, but in some other centres they had decreased or both (Table 2).

The working areas of community health centres found in filariasis cases mostly experienced a decrease in MDA coverage in 2017 but increased again in 2018, but in Bonang I Community Health Centre, which has the highest number of cases, the coverage always decreased during MDA implementation; even in 2018 it was below the target of < 85%.

DISCUSSION

Filariasis Cases Distributions Based on People, Time, and Place

The distribution of filariasis cases in Demak during 2016–18 was entirely in the age group ≥ 15 years. The research conducted in East Nusa Tenggara concerning the examination of microfilariae showed that most of the respondents who were found to have microfilariae in their bodies were aged ≥ 15 years, which showed that the age variable statistically had a significant relationship with the incidence of filariasis (Yunarko & Patanduk, 2018). A study in India

showed that age was one of the strong risk factors for the incidence of lymphatic filariasis at >35 years of age (OR = 12,68) (Chesnais et al., 2019).

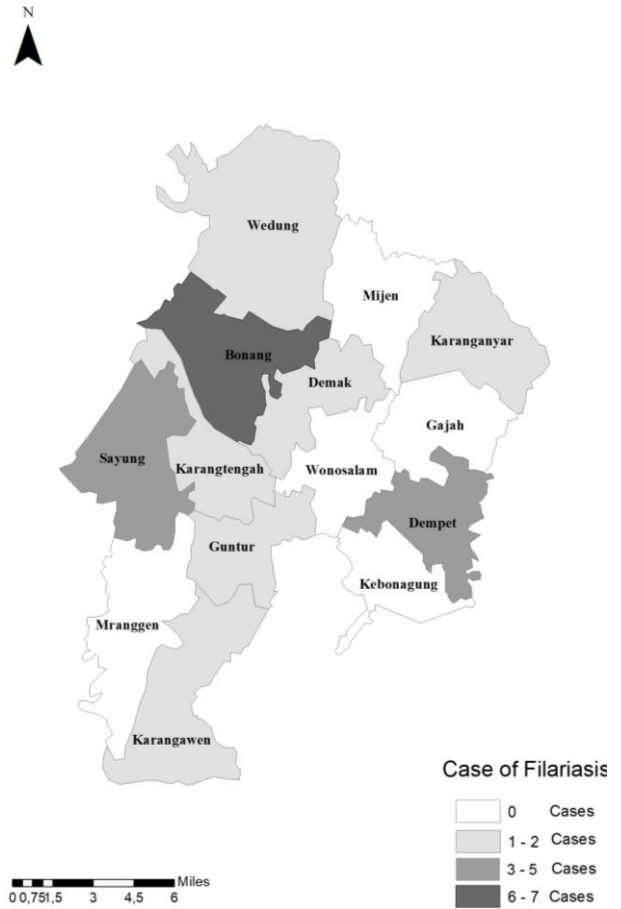


Figure 1. Map of Filariasis Cases Distribution in Demak during 2016-2018 by Sub-district Area

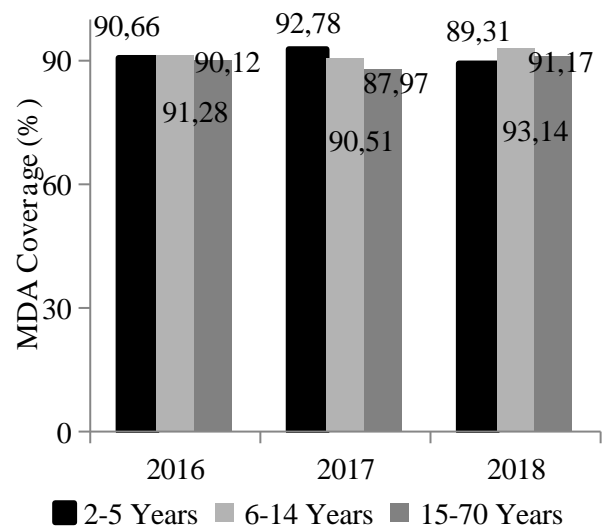


Figure 2. Filariasis MDA Coverage Based on Age Group in Demak during 2016-2018

Table 2

Filariasis MDA Coverage in Demak during 2016-2018 Based on Community Health Center

Community Health Center	MDA Coverage (%)			Total of Filariasis Cases
	2016	2017	2018	
Mranggen 1	90	90,08	96,17	0
Mranggen 2	96	81,55	88,06	0
Mranggen 3	101	87,93	92,06	0
Karangawen 1	73	75,09	91,33	1
Karangawen 2	83	93,93	93,99	0
Guntur 1	87	88,35	91,67	0
Guntur 2	91	93,62	87,74	1
Sayung 1	83	88,51	90,62	4
Sayung 2	99	98,88	99,23	1
Karangtengah	95	89,32	90,34	1
Wonosalam 1	90	89,39	93,73	0
Wonosalam 2	90	93,39	88,38	0
Dempet	91	90,19	91,02	1
Kebonagung	90	92,27	91,01	0
Gajah 1	90	89,27	90,29	0
Gajah 2	98	94,46	95,80	0
Karanganyar 1	96	91,60	94,99	1
Karanganyar 2	100	98,69	97,40	0
Mijen 1	90	90,36	91,60	0
Mijen 2	93	86,44	83,57	0
Demak 1	86	84,99	89,73	0
Demak 2	97	96,15	95,35	0
Demak 3	87	84,08	87,69	1
Bonang 1	87	85,64	84,88	6
Bonang 2	86	83,12	95,78	1
Wedung 1	95	91,82	82,26	0
Wedung 2	82	81,06	93,26	0
Total	91	89,00	91,40	23

Microfilariae infections can occur in all age groups, but adults have a higher risk of infection because they do more activities outside the house and have the possibility of contact with vectors in their workplace (Irfan, Kambuno, & Israfil, 2018). Clinical manifestations of filariasis usually do not appear until years after infection, so the disease is rarely found in children, and symptoms of swelling will usually appear for years after exposure to parasites (Sipayung, Wahjuni, & Devy, 2014).

While filariasis attacks all age groups and both sexes — the most important factor in the transmission of filariasis being contact with vectors of filariasis (Sipayung, Wahjuni, & Devy, 2014). Filariasis cases in Demak during 2016–18 were mostly found in women. This is in line with the research conducted in East Nusa Tenggara, which showed that females had a higher risk of filariasis than males (OR 0.19) (Irfan, Kambuno, & Israfil, 2018). The same thing happened in India, where the distribution and prevalence of

lymphatic filariasis is higher in females than males under various filariasis conditions (Saeed et al., 2018). Females also have a risk of contracting filariasis because they have the same risk of being bitten by filariasis vector mosquitoes. Mosquitoes do not distinguish between male and female humans in sucking blood, but they are strongly influenced by environmental factors related to density of filariasis vectors. This is what distinguishes the incidence of filariasis in males and females (Yanuarini, 2015).

Distribution of filariasis cases during 2016–18 continued to decline in line with the implementation of filariasis MDA carried out in those years. The drugs used were a combination of Diethyl Carbamazine Citrate (DEC) and Albendazole, which have been shown to be effective in decreasing the density of microfilariae (Kar et al., 2015). The results of mass treatment evaluation in Alor Island also showed that the use of Diethyl Carbamazine Citrate (DEC) and

Albendazole could reduce the prevalence of filariasis (Santoso, Yenni, Oktarina, & Wurisastuti, 2015). The MDA provision in some areas has a good impact on decreasing the incidence of filariasis and reducing the Mftrate to <1% (Gyapong, Owusu, da-Costa Vroom, Mensah, & Gyapong, 2018).

The main objective of the MDA programme is to eliminate filariasis because Demak is a filariasis endemic area; from 2016 to 2018 there were 23 new cases. The distribution of filariasis cases in Demak occurred in almost all subdistricts, whether or not the areas were directly adjacent to the coast. The distribution is certainly influenced by the presence of mosquito larvae that act as vectors, such as *Mansonia* sp. and *Culex* sp. These larvae prefer old puddles. Based on research conducted in Pekalongan, the habitats favoured by filariasis vector mosquitoes are places inundated with water and in contact with land, such as rice fields, swamps, and ROB puddles. Locations adjacent to the North Coast also make some areas in Demak Regency flood, which is caused by tides (Wulandhari & Pawenang, 2017). Breeding and resting places of filariasis vectors are important factors in the occurrence of filariasis. There are many breeding and resting places around the houses of filariasis sufferers in the form of bushes and open puddles. Filariasis occurrences are also influenced by the population of people in both the highlands and coastal areas. Many cases of filariasis are also found in the Semarang-Demak basin (Nurjazuli, Dangiran, & Bari'ah, 2018).

Demak District is an area located on the north coast of Java Island. This fact is relevant to it becoming an endemic area because, in general, filariasis endemic areas are lowlands including rural areas and along the coast and inland. A research study conducted in Sarimi District showed that the presence of beaches did not have a significant effect on the number of filariasis cases. This is because people infected by filariasis and those without filariasis have almost the same living conditions and because the transmission is carried out by mosquitoes and is strongly influenced by the mosquitoes' ability to fly distances (Sipayung, Wahjuni, & Devy, 2014).

Filariasis MDA Coverage Based on Age Group

The MDA coverage from 2016 to 2018 in the 15–70 year age group tended to be lower than other age groups. This was because in the productive 15–64 year age group many people are working. For the older people, the number was lower because older people are prone to chronic

illness (Arini, Saraswati, Ginandjar, & Martini, 2018). Based on PMK No. 94 of 2014 concerning Prevention of Filariasis, filariasis MDA is delayed or not given to pregnant women, people suffering from kidney function disorders, liver function disorders, epilepsy, heart and blood vessel disease, seriously ill while carrying out MDA, sufferers with chronic clinical filariasis who are experiencing an acute attack, and/or children with a condition of marasmus or kwasiorkor (Ministry of Health RI, 2014).

The filariasis elimination programme is likely to be hindered by institutional and social policies related to community participation in MDA implementation (Anorital, Dewi, & Palupi, 2016). The public's fear of the side effects of a drug is also one of the reasons that people are reluctant to take the given drugs. The side effects experienced by people who take consecutive drugs, from the most common to the least common, are diarrhoea, fever, itches, and palpitations (Ambarita, Taviv, Sitorus, Pahlepi, & Kasnodihardjo, 2015). One effort that can be made is to cooperate with schools to increase coverage of targeted school-age children. Giving Diethyl Carbamazine Citrate (DEC) combined with Albendazole at school age, is expected to reduce cases of helminthiasis (Anorital, Dewi, & Palupi, 2016).

Filariasis MDA Coverage with Filariasis Cases

The coverage of MDA in Demak for three years has met the target of > 85% of the target population of treatment. This is in line with the objective of filariasis MDA activities in endemic areas, which is to achieve coverage of more than 85% of the target population of treatment and 65% of the total population. This is expected to reduce the rate of microfilariae to <1%, in order to decrease the average density of microfilariae and filariasis transmission (Ministry of Health RI, 2015).

The indicator of success of the filariasis MDA programme is to know the scope of the programme implementation. The calculation of filariasis MDA coverage is the total population taking drugs at the age of 2 to 70 years divided by the total population of MDA targets aged 2 to 70 years. Based on the results of the implementation of filariasis MDA coverage, it is found that coverage in 2016 amounted to 91%; in 2017 coverage decreased to 89%; and in 2018 it increased to 91.40%. Treatment coverage is an important factor as low treatment coverage will be one of the factors that can lead to failure of the elimination programme in the area (Oktarina & Ritawati, 2018).

Factors that can cause low coverage of filariasis MDA is information about the treatment activities not reaching the population — thus, instead of being at the place of treatment residents are still at work or farming, or attending school — and the residents' low level of awareness that they need to take preventive drugs for filariasis every year (Habibah & Sungkar, 2015). One strategy to increase the coverage of elimination programmes is to intervene in the drug distribution process. This strategy can be done by selecting officers who have good education and knowledge about filariasis, such as health workers in the drug distribution programme to the community, so that if there is negative information related to filariasis elimination programmes that can cause low coverage, this can be immediately dealt with so that involvement can increase (Adams et al., 2018).

Low MDA coverage is one of the factors causing the failure of the filariasis elimination programme. Various other reasons include officers who do not directly witness the community taking the drug, people's fear of side effects from the drug, and people feeling healthy or not sick, hence not seeing the need to take the drug (Meliyanie & Andiarsa, 2017). One of the factors that can increase MDA coverage is socialisation from officers. Socialisation regarding the provision of mass drugs to prevent filariasis has a significant correlation — it has been found that coverage is lower where there are officers who lack the motivation to socialise with the community (Alamsyah & Marlina, 2016).

Good planning really needs to be done prior to running a programme in order to increase MDA coverage. This includes conducting advocacy and socialisation activities in regencies, subdistricts, and villages. Coordination is then carried out with community health centres, community leaders, and cadre training, in order to collect appropriate data for the filariasis MDA programme. Increasing the community's knowledge and conducting sweeping checks on residents who do not take drugs concurrently at the current location are also important to achieve the success of the programme, namely increasing filariasis MDA coverage and increasing the level of compliance with taking medication (Marathe & Chalisgaonkar, 2015). Compliance is one of the main factors that is very important in the filariasis elimination programme. The incidence of filariasis is higher in areas that are not compliant compared to areas that compliance to the implementation of mass drug administration (Ojha et al., 2017).

The success of a programme is highly dependent on public awareness, so compliance with taking medication is very important in a treatment. Compliance should be established from the first time the drug is taken, and it is necessary to evaluate compliance for as long as the drug is given so that problems can be identified during treatment. Identifying the signs of non-compliance means they can be addressed quickly and treatment success can be achieved (Fauzi & Nishaa, 2018).

The emergence of new filariasis cases during MDA implementation should be of particular concern, so officers are expected to perform active case detection. This is necessary in order to find filariasis sufferers and to provide immediate and appropriate treatment so that these patients will not be a source of filariasis transmission to other residents (Habibah & Sungkar, 2015).

Research Limitation

This research is a descriptive research with a case series design that only describes secondary data; thus, it cannot be used to test the existence of a causal relationship. In this research there was no comparison between cases and control groups.

CONCLUSION

There were 23 new filariasis cases in Demak from 2016 to 2018 with the majority found in women and in the age group 46–60 years. The distribution of cases occurred in almost all subdistricts in Demak District with most cases in Bonang Subdistrict and in the work area of Bonang I Community Health Centre. Filariasis MDA coverage from 2016 to 2018 in Demak fluctuated but still met the target of > 85%. However, in the work area of Bonang I Community Health Centre and other areas where the cases were found, there was a decrease in the coverage of treatment, which occurred due to several factors. MDA coverage should be increased by performing advocacy and socialisation, especially in areas where coverage continues to decline and filariasis cases are still occurring. Further research is needed regarding factors affecting MDA coverage and the community's compliance with taking the drug.

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