

Economic Burden for Productive Age Malaria Patient: Case Study in Mandailing Natal Regency

Destanul Aulia¹, Intan Permata Sari¹ and Sri Fajar Ayu²

¹Departement of Administration and Health Policy, Faculty of Public Health, University of Sumatera Utara, Jl. Universitas No. 21 Kampus USU, Medan 20155, Indonesia

²Departement of Agribusiness, Faculty of Agriculture, University of Sumatera Utara, Jl. A. Sofian No. 3 Kampus USU, Medan 20155, Indonesia

Keywords: Economic burden, malaria, inpatient, productive age, non productives age.

Abstract: Mandailing Natal is one of the endemic areas of malaria in Sumatera Utara Province. Besides having a high transmission risk, malaria disease also impacts on patient's economy, both in productive and non-productive age. This was a survey study for malaria inpatients from July to December 2017, using quantitative methods calculated based on direct and indirect costs during treatment, then comparing the economics of productive and unproductive age inpatient. Direct costs include inpatient fees, specialist doctor's visit, doctor's and room services, personal hygiene officer, laboratory, medicine, and administration. Indirect costs include transport, extra meals of patient and patient roommate, productivity loss of patient and patient roommate. The purpose of this study was to compare the economic burden in productive and unproductive age patients during treatment. The results showed that the total economic loss of productive age patients was Rp1,907,116 and the total economic loss of unproductive age patients was Rp1,845,499. Total losses in malaria patients of productive and non-productive age are almost the same, with a difference Rp61,667 more in productive age. The high malaria sufferer becomes a high economic burden for the patient, because the productive age patient will lose productive time to work, and non productive age patient will be an additional burden for the family. Mandailing Natal Government needs to develop a comprehensive strategy and policy for the development and improvement of environmental sanitation and community behaviour, because Mandailing Natal Regency is a malaria endemic area with high transmission risk affecting family health and economy.

1 INTRODUCTION

Health development in Indonesia is currently faced with triple burden disease and a condition with the infectious diseases is still a public health problem. Non-communicable diseases is increasing, by the emergence of new diseases. One type of infectious infection disease that is of particular concern is malaria. Malaria is one of the major public health challenges in Indonesia, especially for rural communities. According to (Ministry of Health, Republic of Indonesia, 2018) malaria is an infectious disease caused by parasites (protozoa) of the plasmodium genus, which can be transmitted through anopheles mosquito bites. Accorded to Sorontou (Sorontou, 2013), malaria actually can be prevented by individuals and communities by treating susceptible persons and residents in endemic

areas, providing prophylactic treatment to individuals entering malaria endemic areas, eradicating the nest and anopheles mosquitoes using suitable insecticides, using bed nets when sleep or using repellent that is applied to the skin if it is outside the house at night.

Besides disturbing health, malaria can also cause economic burden. This can happen because a family prioritized malaria treatment. Malaria patients in Mandailing Natal District are dominated by productive age with a 58% percentage compared with unproductive age; this will be an economic burden for society because patients and families of productive age will lose time to work during malaria treatment. While unproductive age patients will be extra burden for the family.

The impact of economic losses caused by malaria is very influential on the economy of society

and government then it is important to conduct cost analysis against malaria disease. Cost analysis of malaria is a method to calculate the amount of casualty (cost, cost) in monetary unit (rupiah), direct cost or indirect cost, to reach the objective (Ministry of Health RI, 2013).

According to WHO (WHO,2017), the cost of care for malaria patients has increased by 4% from 232 million US dollars in 2015 to 241 million US dollars by 2016. About 400 million US dollars each year is needed to finance as a whole the prevention and treatment of malaria in Indonesia, and 100 million US dollars to support health systems and operations (UNICEF, 2009).

Based on data from the Central Bureau of Statistics (BPS) on the results of the economic census in 2016, the economy of Mandailing Natal Regency decreased from 6.49% in 2014 to 6.21% in 2015. In addition, 93.47% of its workforce is in the sector informal, This condition shows the level of wage of the working population in the informal sector is quite low, meaning that if the population is faced with the high risk of transmission of malaria then it is probable that the economic burden of suffering from the disease is very vulnerable faced by the community.

Analysis of malaria treatment cost is considered very necessary to be done in Mandailing Natal District because this area becomes one of malaria endemic areas, so the risk of transmission of malaria disease is very large and then affect the level of morbidity and mortality.

2 METHODS

This study was a survey of malarial inpatients from July to December 2017, using quantitative methods calculated based on direct cost and indirect costs during treatment, then comparing the economic burden on the patient's age productivity and non-productivity. Direct costs include inpatient fees, specialist doctor's visit, doctor's services and room attendant, personal hygiene officer, laboratory, medicine, and administration. Indirect costs include transport, patient extra meals and patient care, as well as patient and patient productivity costs of missing patients.

The inclusion criteria for sample selection are: (1) Patients (BPJS and general) with the primary diagnosis of uncomplicated malaria hospitalized in July - December 2017; (2) Patients with complete data (age, sex, LOS, treatment class, diagnosis) and

drug (drug name) and (3) Domiciled in Mandailing Natal District.

3 RESULT

Table 1: Characteristics of respondents.

Characteristic	Number	
	F	%
Aged (Years)		
a. 0-5	15	23
b. 16-11	10	15
c. 12-17	6	9
d. 18-23	6	9
e. 24-29	6	9
f. 30-35	3	5
g. 36-41	6	9
h. 42-47	4	6
i. 48-53	6	9
j. 54-59	2	3
k. 60-65	2	3
l. >65	0	0
Sex		
a. Male	40	61
b. Female	26	39
Job		
a. Non-Job	16	24
b. IRT	1	1
c. PNS	1	1
d. Privite Worker	3	4
e. Self-enterprise	5	8
f. Farmer	3	5
g. Merchant	7	11
h. Worker	6	9
i. Students	19	29
j. Others	5	8
Income		
a. <Rp. 1.000.000	5	16
b. Rp1.000.000-2.000.000	14	45
c. >Rp. 2.000.000	12	39
Inpatient Class		
a. VVIP	4	6
b. VIP	3	5
c. Class I	18	27
d. Class II	14	21
e. Class III	27	41
Assurance		
a. BPJS	36	55
b. Genaral	30	45
LOS		
a. <3 days	33	50
b. 3-5 days	32	48
c. >5 days	1	2

Table 2: Direct cost of general inpatient.

Direct Cost	Class (Rp)				
	VVIP	VIP	Class I	Class II	Class III
Drug	454675	273955	263770	5747000	1024755
dr Visiting	220000	120000	165000	190000	140000
Room worker	330000	240000	330000	510000	840000
Nurse	55000	40000	50000	95000	140000
Lab	440000	320000	400000	760000	1120000
Adm	60000	45000	60000	120000	165000
Inpatient	1815000	1120000	1200000	1140000	840000
Total	3374675	2158955	2468770	3389700	4269755
Average	843669	719652	617103	431213	388160

Table 3: Indirect cost of general inpatient.

Indirect Cost	Class (Rp)				
	VVIP	VIP	Class I	Class II	Class III
Transport	63000	159000	197000	305000	466000
Room-mate	538000	450000	482000	140000	762000
Loss of Productivity	1016000	1020000	624500	1273500	1340000
Total	1617000	1629000	1303500	1718500	2568000
Average	404250	543000	325875	214812	233455

Table 4: Direct costs of BPJS patients.

Class	Total cost (Rp)
I	2.964.700
II	2.541.200
III	2.117.600

Table 5: Indirect cost of BPJS inpatient.

Indirect Cost	Total Cost		
	Class I (n=14)	Class II (n=6)	Kelas III (n=16)
Transport	Rp.535.000	Rp.247.000	Rp.533.000
Room-mate	Rp.1.298.000	Rp.930.000	Rp.1.619.000
Productivity	Rp.3.994.500	Rp.2.144.000	Rp.2.428.750
Total	Rp.5.827.500	Rp.3.321.000	Rp.4.580.750
Average	Rp.416.250	Rp.553.500	Rp.286.297

Table 6: Average cost of malaria treatment.

	Outcome		Total
	Direct cost	Indirect cost	
General	Rp.525.650	Rp.315.067	Rp.840.717
BPJS	Rp.2.517.628	Rp.381.368	Rp. 2.898.996

Table 7: Average malaria costs in productive aged.

	Outcome		Total
	Direct Cost	Indirect Cost	
General	Rp.609.037	Rp.369.038	Rp.978.076
BPJS	Rp.2.416.582	Rp.407.926	Rp. 2.836.156

Table 8: Average malaria costs in non-productive aged.

Guaranteed			Total
	Direct cost	Indirect Cost	
General	Rp.461.883	Rp.273.794	Rp.735.677
BPJS	Rp.2.608.037	Rp.347.184	Rp. 2.955.221

4 DISCUSSION

4.1 Characteristics of respondents

The results showed that in the productive age category (15-65 years) there was a higher number compared with the unproductive age of reaching 58%. The high number of malaria sufferers at the productive age will have a greater impact on the economic losses for both the patient and the family and the government. Based on sex, it turns out that most respondents who suffer from malaria is male amounted to 40 people (61%). The cause of the large number of male respondents exposed to malaria is associated with a higher risk of malaria in males due to environmental risks and working time and this will be a problem because male with productive age is majority worker in Mandailing Natal. The income of respondents who are productive age is Rp.1.000.000 - Rp.2.000.000, - per month as 14 people (45%). average income of respondent is Rp.1.683.710, - / month, this income of respondents who are still below of regional income of Mandailing Natal Regency in 2017 amounting to Rp. 2,096,250, -. This indicates that the respondent has limitations in saving his income every month because the money is only enough for the daily needs, so it will become an economic burden if malaria occurs. Under the guarantor, patients are guaranteed by BPJS more than the general patients. While the type of treatment class is selected. Most patients are in the third class is 41%. This is because patients who are hospitalized via BPJS are as much as 44%, a beneficiary contribution (PBI). While in general patients, as many as 37% of respondents chose class I as an option to get inpatient services due to the cost of maintenance that is quite affordable. Based on the long days of hospitalization (long of stay), most of the 50% of

respondents treated ranged from 1-2 days. While the overall average is for 3 days of care.

4.2 Total economic losses in general patients (direct cost + indirect cost)

The total cost of the respondents directly related to the treatment (direct cost) is Rp.15.769.495, - with an average of Rp.525.650, In addition, respondents also incur costs associated with loss of productivity (indirect cost) with a total of Rp.8.947.000, - and an average of Rp.315.067, -. The total economic loss of the patient (general) as a whole is Rp. 23,673,470, - and on average Rp. 840.717.

4.3 Total economic losses in patients of bpjs (direct cost + indirect cost)

The total cost incurred by BPJS in the treatment (direct cost) of malaria patients is Rp. 30.634.600, - with an average of Rp. 2,517,628. In addition, patients also incur costs associated with loss of productivity (indirect cost) with a total of Rp. 13,729,250, - and on average Rp.381.368.

4.4 Cost comparison of productive and unproductive age

The results showed that the total economic loss of patients of productive age is Rp1,907,116 and total economic losses of unproductive age patients is Rp1,845,499. Total losses in malaria patients of productive and non-productive age are almost the same, with a difference of Rp61,667 more in productive age, respondents of productive age and have worked mostly as traders and labourers. If malaria occurs they cannot work during hospitalization and will lose their income. The cost of productivity loss in this study is limited only when the patient is admitted in hospital, as well as

the companion calculated based on the length of time he accompanies the patient in the room. The total cost of loss of productivity will surely be greater considering that after the patient leaves treatment room, it still takes a few more days for rehabilitation and rest until it is fully recovered and ready to return to work as usual. The results showed the average income of patients of productive age lost with the length of 3 day care is Rp.176.927, - and company Rp. 88146, -. While the unproductive age patient does not lose income because there is no work, but the patient's family recovering their treatment fee is lost with an average of Rp.136.836.

5 CONCLUSION

1. Based on the results of the study of malaria patients hospitalized at RSUD Panyabungan period July - December 2017 productive age reaches 58% and male patients 61%.
2. Based on the type of work in productive-aged patients, most of them are traders and labourers and most unproductive age is student.
3. Total economic loss of patients (general) as a whole is Rp. 23.673.470, - with an average of Rp. 840.717, -. Total economic loss of patients (BPJS) and government is Rp. 104,363,850, - with an average of Rp. 2.898.996.

REFERENCES

- As'ad, H., Asiah, H., dan Haerani. 2012. Kerugian Ekonomi (*Economic Loss*) Pasien Rawat Inap Usia Produktif Pada Lima Penyakit di RSUD Mamuju. Jurnal AKK, Vol 1 No 1. Makassar: Universitas Hasanuddin. Dipublikasi September 2012.
- Badan Pusat Statistik Kabupaten Mandailing Natal. 2017. Sensus Ekonomi 2016 Analisis Hasil Listing Potensi Ekonomi Kabupaten Mandailing Natal. Mandailing Natal : BPS Kabupaten Mandailing Natal.
- Badan Pusat Statistik Kabupaten Mandailing Natal. 2017. Kondisi Kesehatan Penduduk Kabupaten Mandailing Natal. Mandailing Natal : BPS Kabupaten Mandailing Natal.
- Dinas Kesehatan Kabupaten Mandailing Natal. 2016. Laporan Pengendalian Penyakit Malaria Tahun 2015. Mandailing Natal : Dinas Kesehatan Kabupaten Mandailing Natal.
- Dinas Kesehatan Sumatera Utara. 2016. Laporan Pengendalian Penyakit Malaria Tahun 2015. Medan : Dinas Kesehatan Sumatera Utara.

- Kemendes RI. 2008. Pelayanan Kefarmasian Untuk Penyakit Malaria. Jakarta: Kementerian Kesehatan Republik Indonesia.
- _____. 2013. Pedoman Penerapan Kajian Farmakoekonomi. Jakarta: Kementerian Kesehatan Republik Indonesia.
- _____. 2017. Profil Kesehatan Indonesia Tahun 2016. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Sorontou, Y., 2013. Ilmu Malaria Klinik. Jakarta: EGC.
- UNICEF. 2009. Fakta Malaria. Jakarta: UNICEF.
- WHO. 2017. *World Malaria Report 2017*. Geneva: *World Health Organization*
- Yanuar, Ferri., 2003. Biaya Akibat Sakit (*cost of illness*) malaria: Studi kasus di RSUD Sungailiat Kabupaten Bangka Tahun 2003. (Tesis). Jakarta: Universitas Indonesia.