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PROFILE OF LEPROSY IN CHILDREN FROM 2014-2018 IN DR. SOETOMO GENERAL HOSPITAL SURABAYA

Billy Jiwandono
Medical Study Program. Faculty Of Medicine. Airlangga University. Surabaya
***Email*:** jiwandono.billy@gmail.com

ABSTRACT

Leprosy is an infectious disease caused by Mycobacterium Leprae. The exact how leprosy transmitted is still not proven yet, however many researchers believe that leprosy transmitted through nasal droplets and direct contact with skin. There are many other factors that may influence transmission include genetic problem, extent of exposure and the environmental conditions. Children are believed to the most vulnerable to leprosy. This study aims to described and analysed new leprosy profile in children at Dermatology and Venereology clinic of Dr. Soetomo General Hospital Surabaya from 2014-2018. This study is descriptive method using patient medical data record. The sample of this study was all children with new leprosy in Dr. Soetomo General Hospital from 1st January of 2014 until 31th December of 2018. The data is taken from Dermatology and Venereology Clinic of Dr. Soetomo General Hospital. Afterwards, computed and compiled using univariate and bivariate on Microsoft Excel 2016. There are 49 medical records of new leprosy patients in children found at Dermatology and Venereology clinic of Dr. Soetomo General Hospital Surabaya from 2014-2018. Most age groups occur at the age of 12-14 years old (42.6%). Male has higher risk than female (53.2%). Most of the patients did not know if had close contact with leprosy. However, 7 out of 14 patients (50%) had contact with leprosy from family and neighbor. Most of the lesion type form WHO classification is dominated by Multibacillary (40.4%) and Most of lesion type form Ridley-Jopling is Borderline-borderline (BB). The majority of the patients from Surabaya (55.3%). Most of the patients was supplemented with Vit B1 Tab 50mg (46.8%). In conclusion, most of the new leprosy patients in children are male, age 12-14 years old, contact with family member who had leprosy before, with Multibacillary lesion and BB type, from Surabaya, and was given Vit B1 Tab 50mg as extra supplement.

Keywords: Leprosy, Children, Profile, Descriptive

1. INTRODUCTION

Leprosy is a chronic infectious disease caused by Mycobacterium leprae which can be transmitted through breathing, air, direct contact with patients. This disease usually affects the skin, mucous membranes and peripheral nervous system. If the disease not treated well, it may damage the skin, nerves, limbs and eyes, which leads to significant morbidity and neurological damage.

Leprosy is one of the most common diseases in the world, especially in developing countries. According to World Health Organization (WHO) the highest new leprosy cases is taken by South-East asia region with number of cases reaching 156,111 cases (WHO,2019). Indonesia is 3rd in new leprosy cases, after India and Brazil (Ministry of Health, 2019). In 2019, Indonesian ministry of health declared the new leprosy cases in Indonesia reached 15,910 or found 6.07 new cases of leprosy per 100,000 population. Even though based on Indonesian ministry of health is categorized as low burden because less than 10 per 100,000 population, there are still several provinces remaining that have not reached elimination rate.

Children are defined as the most vulnerable group to infection with Mycobacterium leprae because of their immature or undeveloped immunity and exposure to intrafamilial contacts (Narang,2019). Moreover, the continuation transmission in children represents a failure of the health system to diseases program. Indonesian ministry of health declared leprosy has become a national health problem. The number of new leprosy cases detected in children worldwide continues to be enormous. In 2017, children reached 8.1% of new cases worldwide are 16,979 children diagnosed and 238 children with grade 2 disabilities (WHO,2019). Based on data from the Indonesian ministry of health in 2018, the new cases detection rate (NCDR) in children 0 to 14 years old per 100,000 population in period 2013 to 2017 reached more than 11%. This is quite high compared to Indonesian NCDR target about less than 5%.

Leprosy in children does not only affect children's health but also neurological damage because they may be stigmatized, bullied, and shunned (Narang, 2019). Thus, it is really important to increase awareness about leprosy and reduce leprosy NCDR. In areas where leprosy is still widespread, such as Indonesia, understanding the behavior of leprosy is quite necessary. It is needed to decide differential diagnoses not only among dermatologists but also all professionals who are in providing medical care to children. Based on Oliveira's journal in 2016, early diagnosis and treatment of children with leprosy are very essential, moreover,

there is still a lack of effective vaccines to preventing of disabilities and deformities and reduce the physical and psychosocial burden.

Due to relatively few publications on children's leprosy, my research tries to describe and summarize all factors that may influences leprosy in children. The data collected medical records of new leprosy cases in children period 2014 to 2018 from Dr. Soetomo General Hospital.

2. RESEARCH METHOD

The Conceptual Design In This Research Can Be Seen In Figure 1.

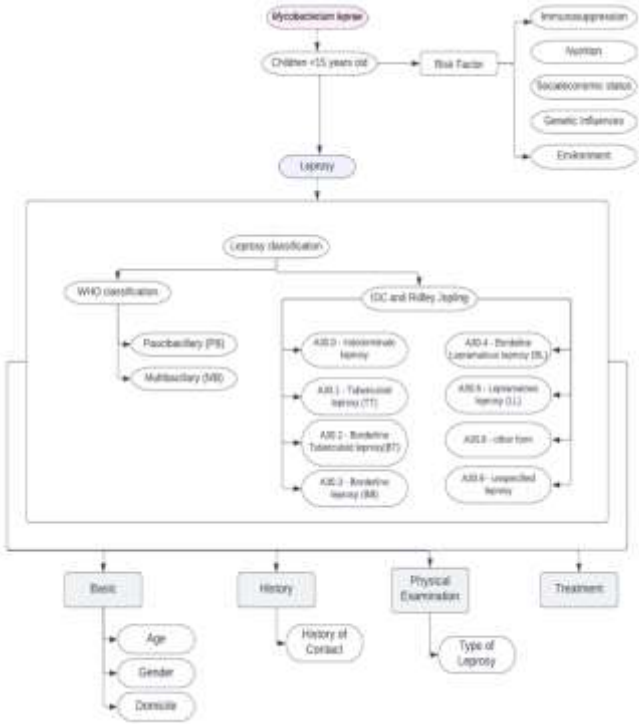

Figure 1. Conceptual Design

2.1 Study Design

This research uses a descriptive study and retrospective design with quantitative approach. This study will provide summarize of new case leprosy profile in children from 2014 to 2018 in Dr. Soetomo General Hospital Surabaya. This study will be conducted at Dermatology and Venereology outpatient clinic of Dr. Soetomo General Hospital Surabaya. The period of the research is carried out from July 2019 to November 2019.

2.2 Population and Sample

The target population of this study consisted of leprosy patients who are under 15 years old and being first admitted at Dermatology and Venereology outpatient clinic of Dr. Soetomo General Hospital Surabaya. The subjects on this study were included to sample based on meeting following:

a. Inclusion criteria

The patient should be :

1. New patient or cases of leprosy in Dermatology and Venereology outpatient clinic of Dr. Soetomo General Hospital Surabaya
2. The age of children is under 15 years old (0-14 years old) who first admitted in Dermatology and Venereology outpatient clinic of Dr. Soetomo General Hospital Surabaya.
3. The case of new patient of leprosy in children should be on period 2014 to 2018.

b. Exclusion criteria

Insufficient data of the medical record with more than 3 variables missing from the record. The data were collected by skimming through all patients under 15 years old at Dermatology and Venereology clinic of Dr. Soetomo General Hospital Surabaya.

The sample size was obtained by total sampling or all the total number of patients under 15 years old at Dermatology and Venereology outpatient clinic of Dr. Soetomo General Hospital Surabaya. The method of this research is consecutive sampling or also known as total enumerative sampling. This sampling technique is defined as a non-probability sampling technique where every subject meeting the criteria of inclusion is selected.

c. Variables

The variables that used in this study are the risk factor of leprosy that record on patients' medical record.

Table 1. Variable and definition of research operational

VARIABLES	DESCRIPTION	HOW TO MEASUREMENT	MEASUREMENT
Prevalence	Total of new leprosy cases in children from 2014-2018	Medical record	Total patients
Ages	The age of patient when first admitted to Dermatology and Venereology outpatient clinic of Dr. Soetomo General Hospital Surabaya.	Medical record	a) 0-2 years b) 3-5 years c) 6-8 years d) 9-11 years 12-14 years
Gender	The patient biological gender	Medical record	a) Female Male
Domicile	The patient's home area and environment surrounding	Medical record	a) Surabaya b) Surabaya satellite cities (Gresik, Bangkalan, Mojokerto, Sidoarjo, and Lamongan) Others (Madiun, Probolinggo, Jombang, Pasuruan, Sumenep, and Palangkaraya)
Leprosy history	The patient's background history of leprosy.	Medical record	a) Ever diagnosed leprosy before b) Close contact c) Social Contact d) Unknown No-data provided
Leprosy type	Leprosy classified based on WHO and Ridley-Jopling classification.	Medical record	Type leprosy based on WHO: a) Paucibacillary (PB) b) Multibacillary (MB) c) Others Type leprosy based on Ridley Jopling: a) Borderline (TT) b) Borderline Tuberculoid (BT)

			c) Borderline Borderline (BB) d) Borderline Lepromatous (BL) e) Lepromatous (LL) f) Others
Treatment	The treatment that used on most leprosy patient.	Medical record	The treatment of the patient: a) Supplement and extra medication b) No extra medication List of medication commonly used: a) Paracetamol Tab 500 mg b) Urea Cream c) Methyl Prednisolone d) Natrium Diclofenac Tab 50mg e) Vit & Ferro Sulphate Mineral Combination f) Vit B1 Tab 50 mg Vit B Complex

d. Operational Definition
   1. Leprosy patients are patient who are diagnosed in Dr. Soetomo General Hospital Surabaya.
   2. Patient must be children between 0 to 14 years old.
   3. Patient must be admitted in Dr. Soetomo General Hospital for the first time. In short, patient is new patient.
   4. Medical record is a file containing the identity, diagnosis, information on patient's condition and treatment while admitted in Dr. Soetomo General Hospital. The medical records also must contain at least 3 variables such as
      a. Age. The patient must be a child from newborn babies (0 months old) to adolescent around 14 years old.
      b. Gender. The patient gender will be differentiated with male and female.
      c. Leprosy history. The patient probably ever diagnosed before in other hospital, the patient may have close contact with family or social contact with neighbors who had leprosy.
      d. Domicile. The patient's domicile will be differentiated into three places, Surabaya city, Surabaya satellite cities, and others.
      e. Leprosy type. A lesion might appear on the skin and will classified with WHO and Ridley-Jopling classification.
      f. Treatment. Most leprosy patient are treated by MDT drugs. However, other medication is needed to reduce leprosy symptom. This treatment will describe all additional medication that uses to treat leprosy.

e. Processing and Analysing Data

The procedure of data collection will be using secondary data that is medical record. The data will consist of age, gender, domicile, contact history, type of leprosy, and treatment. Data will be process by collecting data from patients' medical records at Dermatology and Venereology clinic of Dr. Soetomo General Hospital Surabaya. Data Entry is done by moving data from the data collection sheet into the master table. Data will be compiled and sorted based on satisfy the requirements of inclusion and exclusion.

Complying data will use Microsoft Excel or similar software. Data analysis will also be collecting any relevant journals and any references that can support this research. After data collected that the data will be compile and compare with the medical record data.

f. Ethical Clearances

This research will only take place after obtaining an ethics feasibility letter that was validate by the Research Ethic Committee of the Faculty of Medicine University of Airlangga and the Research Ethic Committee of Dr. Soetomo General Hospital Surabaya because the source of data from this study came from medical record owned by Dr. Soetomo General Hospital. Researcher obtained ethic certificate form ethic committee with number 1655/KRPK/XI/2019 (See attachment 1).

Due to confidential regulation, researcher will not include the patients name or identity based on the medical record. Moreover, researcher guarantee the validity of the data and included the patients' medical record number. Researcher ensure patient confidentiality. Data obtained from medical records will only be used for research and will not be used without permission from the Research Ethic Committee of the Faculty of Medicine University of Airlangga and the Research Ethic Committee of Dr. Soetomo General Hospital Surabaya.

3. RESULT AND DISCUSSION

Research data was taken from medical records at the Dermatology and Venereology clinic of Dr. Soetomo General Hospital Surabaya period 1 January 2014 – 31 December 2018. The data has been sorted based on inclusion and exclusion of the sample criteria.

The number of new leprosy patient.

Table 2. The percentage of new leprosy patient in children

	2014	**2015**	**2016**	**2017**	**2018**
Total new leprosy patient	149	131	148	135	125
Total new children leprosy	14	14	6	8	7
percentage	9.39%	10.68%	4.05%	5.92%	5.6%

Based on data above, the total number of children who firstly admitted with leprosy at Dr. Soetomo hospital had been decrease after 2014 and 2015. Although there is still a slightly increase patient on 2017 but it continues decrease on 2018. Based on data above, the ratio of new leprosy patient in children and adult is hovering around 4% to 10%.

Based on the data that has been taken, samples analyzed descriptively included: age, sex/gender, contact with leprosy history, type of lesions, environment, and treatment.

Children around 12- 14 years old are the most common age range to infected by leprosy, there are 20 patients aged between 12 to 14 years old. Children below 2 years old have not occurred during this period and children aged between 3-5 is the least common within 3 patients. Most of the sexes are male, which is 26 patients (53.2%). The ratio between females and males is 1: 1.13. The patients come from the Surabaya region within 26 patients and Surabaya satellite cities within 16 patients.

Contact with the leprosy of new leprosy patients in children at Dermatology and Venereology clinic of Dr. Soetomo General Hospital Surabaya period 1 January 2014-31 December 2018. Due to lack of information during the period 1st January 2014 to December 2016, therefore data about leprosy contact will start from January 2017 to December 2018. With total data of 13 patients and other patients without leprosy contact history data will be called as no-data in this variable.

Based on data, the most of medical history in this data does not have data about leprosy contact or leprosy history. However, around 5 out of 13 patients mostly do not know if they had contact with leprosy before. Moreover, there are 4 out of 13 patients said that had close contact with a family member who has leprosy and there are 2 patients that had social contact with non-familial member who has leprosy.

Leprosy type of new leprosy patients in children at Dermatology and Venereology clinic of Dr. Soetomo General Hospital Surabaya period 1 January 2014-31 December 2018. In these criteria, the data will be divided into two leprosy classification based on WHO and Ridley Jopling. Based on data, there are 33 out of 49 patients had multibacillary (MB) type with the highest peak on 2015 with 9 patients infected by MB type leprosy.

There are 18 out of 49 patients had A30.3 or borderline-borderline (BB) type. The peak of BB type leprosy on 2015 with 5 patient and it continues decrease until 2017 then it increases doubly on 2018 with 4

patients on 2018. The less common is A30.1 or tuberculoid leprosy (TT) and A30.2 or borderline-tuberculoid (BT) with 5 patients each.

Based on the Indonesian ministry of health, the treatment of leprosy is appointed using MDT treatment. However, another medication is needed to reduce the symptoms and prevent deformity. The extra medication that uses in new leprosy patients under 15 years old at Dermatology and Venereology of Dr. Soetomo General Hospital Surabaya period 1 January 2014-31 December 2018. Most of the patients had extra medication to help patients against leprosy. There are 35 out of 49 patients that use extra medicine or supplements. The list of medicines and supplements can be seen in the figure below.

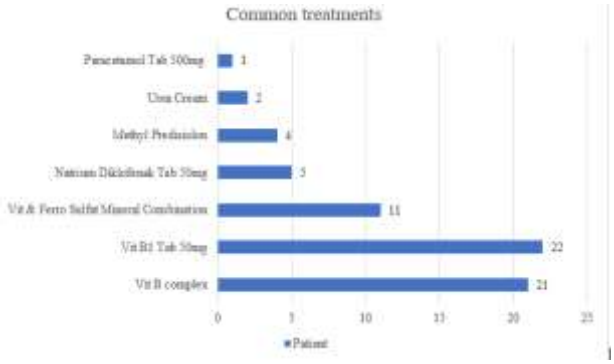

Figure 2. Medicine that commonly given to children patient at Dr.Soetomo hospital from 2014 to 2018

Based on the figure above, 22 out of 49 children are given vitamin B1 tab 50mg. Moreover, 21 out of 49 children received Vitamin B complex. In this treatment, children may receive more that 2 types of supplements or medications. The most common combination supplement is Vitamin B1 Tab 50 mg and Ferro Sulphate mineral and Vitamin B complex and Vitamin B1 Tab 50 mg.

3.2 Number of New Leprosy Patients in Children from 2014-2018

The total number of new leprosy patients in children aged 0-14 in 2014-2018 at the Dermatology and Venereology clinic of Dr. Soetomo General Hospital was 49 patients. The number of patients has increased when compared to the number of new patients in 2009-2011. Although, there is a slight increase on 2017 to 2018 but in general the result shown a significant decline of the number new children's cases from 2015 to 2018. In 2016, the new cases of leprosy in children are the lowest and the percentage of new leprosy in children deplete to 4.05%. The percentage of children leprosy is hovering around 4% to 10% , this is also mean there are at least 1 child out of 10 to 25 new leprosy patients.

3.3 Age Distribution of New Leprosy Patients in Children

Most age of new leprosy patients in children in 2014-2018 at the Dermatology and Venereology clinic of Dr. Soetomo General Hospital is 12-14 years old by 20 patients (42.6%), followed by the age of 9-11 years old with the acquisition of a percentage of 16 patients (31.9%). The youngest leprosy patient in 2014-2018 in the Dermatology and Venereology clinic of Dr. Soetomo General Hospital for this study was 3 years old. The results of this study are in line with research conducted in Brazil by Oliveira and Diniz (2016) which states that leprosy in children for patients aged under 15 years old is dominated by groups of children aged between 10 to 14 years. Moreover, previous studies are taken from 2009-2011 also have the same results which 70.3% of cases were in the group of children aged 10-14 years (Wulan, Agusni, and Rosita, 2014). Based on the data result and other researchers journal and research, children around 10-14 years more like get leprosy due to the disease long incubation period around 3 to 5 years. In case there a contact with leprosy patient before then it may not directly contagious on that period of time but smear or lesion may appear on 3 or 5 years after contact due its long incubation.

In this study, leprosy does not develop in children under 2 years old. Although Brubaker said in their study that leprosy may occur at a younger age or transmit through breastfeeding but in this research, there is no patient under 2 years old that was admitted to Dr. Soetomo's hospital during that period.

3.4 Sex/gender Distribution of New Leprosy Patients in Children

Gender/sex distribution of new patients dominated by male patients rather than women, which is equal to 53.2% (26 patients). Whereas female patients were only 46.8% (23 patients). The ratio of male patients to females was 1.13: 1. The difference in the percentage of leprosy in children between male and female is not

much different from previous studies. A retrospective study in 2014 showed a ratio of male and female patients of 1.5: 1.

The difference in the number of male and female patients can be influenced by several factors including the opportunity for contact, environmental factors, social factors. Wulan, Agusni and Rosita (2014) stated that it could also be influenced by differences in hormones and genes. It was mentioned that male tend to be more active outside the home so they are more often exposed to patients who might be a source of infection. Personally, in this research the differences between males and female patient are not significantly different. Male indeed more active outside home. However, in children males and females had same amount of going outside home, such as playing outside their home and going to school. Moreover, children either male or female more likely stay inside longer than adult. Therefore, if there is a leprosy in their household or nearby, children either male or female had same amount risk to get leprosy. Thus, the best way to prevent leprosy transmission is to increase leprosy awareness and knowledge about the disease.

3.5 Domicile of New Pediatric Leprosy

East java is one of leprosy endemic region in Indonesia and the highest of new leprosy cases in children and adult. Indonesian health minister assigned the standard of leprosy elimination in children is 5%. In 2019, Surabaya as a city also still did not reach leprosy elimination rate in children with 8.2%. Based on the patient's domicile, as many as 55.3% of patients are domiciled in Surabaya and the rest are from outside Surabaya. From the data obtained, the average patient is still from the East Java region, but there are also patients from outside Java such as from Kalimantan. The large number of patients originating from Surabaya can be caused by easy access to transportation in Surabaya. For patients from out of town can be caused by many things such as being on a visit, a vacation, or even according to previous research can be caused by shame and fear of being ostracized by their environment (Wulan, Agusni and Rosita, 2014).

Due to limited data, children's medical data records do not provide further information about how their domicile area. This research has difficulty to analyzed patient housing condition, either it is in rural area or city area, house sanitary and house condition.

3.6 Contact with Leprosy History of New Leprosy Patient in Children

Contact with leprosy history in this study only exist in 2017-2018. From these data the most answers found do not know if the patient had leprosy before or contact with some with leprosy within 5 patients out of 14 patients. Then, it followed by patients that ever contact with a family member who had leprosy within 4 patients out of 14 patients. Meanwhile patient that contact with a non-family member who had leprosy is only 2 patients. Based on Narang and Kumar on their paper 2019 state that one of most important sources of infection in children's cases is familial contact with leprosy. A patient may have risk to developing leprosy 4 times higher in neighborhood contact, but the risk may increase to 14 times in intrafamilial contact. This is shown on the result that contact with leprosy patient either intrafamilial or neighbor is one of factors that affects leprosy infection in children.

Same as domicile problem, data form children medical records still have lack of information about contact history. This is shown that contact with leprosy history just started on 2017. For future research, the best way to get better understanding and information about leprosy is conduct a rapid survey or quick questioner upon first admitted on Dr. Soetomo General Hospital.

3.7 Lesion Type Distribution of New Leprosy Patient in Children

Lesion Type of new leprosy patients in children classified into two type classification such as WHO and Ridley-Jopling.

In WHO classification, the result shown that multibacillary (MB) is the most common cases on leprosy with 33 patients. MB is the most common type leprosy in Indonesia, usually in male patient because male expected to be more active outside. Data from ministry of health, shown that more than 80% of patient MB is left untreated. Based on Ruiz-Fuentes and Castillo paper 2019, In the last decades leprosy in children has been increase in multibacillary form. This due to the greater exposure children to bacillus with infected patient that not had treatment in their surrounding area.

In Ridley-Jopling classification, the result shown that A30.3 type or Borderline-borderline (BB) is the most common type with 18 out of 49 patients. BB leprosy is an uncommon form of MB leprosy and the most unstable form. It represents the immunologic midpoint in the clinical spectrum of granulomatous disease (Shenoy,2019). BB leprosy occurs because there is anomaly in gene that make patient's body does not produce enough protein to create an enzyme that help the immune system to function properly. This can be influence by nutritional status or uncomplete vaccination. However, the influences of this type may not be shown in this study due to the limited data on patient's medical record data.

3.8 Extra Treatment that Given to New Children Leprosy Patient

Indonesian health minister assign that all leprosy type either PB and MB type is using Multi Drug Therapy (MDT) treatment. Exception for MDT treatment is given to patient with special cases or conditions such as drugs resistance condition. Thus, in this study all patients are given MDT drugs based on their lesion type according to WHO classification.

In this research, treatment discussed about extra medicine that is given to patient to reduce their symptom or prevent more deformity or disability. The research shown that 35 out of 47 patients need extra medication and supplement along MDT treatment and 14 patients remain with only MDT treatment.
Most common medicine to supplement children leprosy is Vitamin B1 Tab 50 mg with result 22 out of 47 patients and Vitamin B complex with result 21 out of 49 patients. The patient may not only get one extra supplement but may get two or three type medicine along with MDT. The most common supplement combination is Vitamin B1 Tab 50 mg and Vit & Ferro Sulphate mineral combination using 9 out 47 patients. Giving Vitamin B1 to the patient because most patient suffers lack of nutrients. Thus, by increasing patient immune system and nutrient, research believe vitamin will help patient for self-healing.

4. CONCLUSION AND SUGGESTION

4.1 Conclusion

The objectives in this study described and analyzed the profile of new leprosy patient under 15 years old at department of dermatology and venereology at Dr. Soetomo General Hospital Surabaya from 1st January 2014 to 31st December 2018.

1. There are 49 children with leprosy that firstly admitted to Dr. Soetomo.
2. Most gender in children leprosy is male
3. Most of the patient aged between 12 to 14 years old.
4. Most of data about contact with leprosy history did not exist, however there are 14 patients who has the data. The most common is they do not know if they had contact with a leprosy patient and the second the most is had close contact with a family member who had leprosy.
5. Mostly patient is from East-Java region and the higher endemic region in Indonesia. More that 50% of the patient come from Surabaya city and around 30% of the patients come from Surabaya Satellites cities such as Gresik, Bangkalan, Mojokerto, Sidoarjo and Lamongan.
6. The type of leprosy divided into two classifications such as WHO classification and Ridley-Jopling classification.
    a. Based on WHO classification is multibacillary (MB) type
    b. Based on Ridley-Jopling is A30.3 or known as borderline-borderline (BB) type.
7. All type of leprosy treated with MDT treatment. However, more than 50 % of children patients are prescribed with other supplements. The most common supplement is Vitamin B1 Tab 50 mg and Vitamin B complex.

4.2 Suggestions

Due to very limited data from the children's' medical record, it is rather difficult to analysis the behavior of leprosy in children. There are many risk factors that not covered in this research. The suggestions for further study are

a. Conduct a quick and simple survey to leprosy patient who firstly admitted to Dr. Soetomo hospital. The survey must contain valuable data about risk factors and patient general information. (See attachment 2 for survey example)
b. Increase leprosy awareness through public health announcement in public clinic and hospital, public area such as school and social media.

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