

Predictive Index The Incidence Of Tuberculosis Children In South Kalimantan Province

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Abstract: The research objective to formulate predictive index of Tuberculosis Children in South Kalimantan province. Research methods combined (mixed methods) with a combination of research model (Sequential Exploratory Design) qualitative approach to support quantitative and centered on quantitative (Sugiono, 2012), case control design. The number of qualitative sample was 16 respondents to interviews and 48 respondents for FGD. The number of quantitative research sample was 216 consisted of 62 cases and 154 controls. Qualitative sampling by purposive sampling and quantitative Multi-stage Cluster random sampling on 3 stages. The analysis technique used is descriptive qualitative and Confirmatory Factor Analysis (Confirmatory Factor Analysis), measure the latent of variables by using path analysis (path analysis) with the program Linear Structural Relationships (LISREL). The results showed a positive effect on the socio-cultural environment and significantly associated with the incidence of Tuberculosis Children. While the physical environment of the house positively and significantly with biological environments, and the incidence of Tuberculosis Children and immunization and nutrition status of children positively and significantly to the incidence of Tuberculosis of the Child, as well as to the biological environment positive and significant effect on the incidence of TB Children. Formulation Predictive Index of Tuberculosis Children in South Kalimantan province. is index = $0:19 * \text{Physical Environment} * \text{Home} + 0:44 + 0:53 * \text{Biological Environment Social Environment Culture} + 0:19 * \text{Status Immunization and Child Nutrition}$. The results of all the R-square value indicates that all of the R-square values > 0.5. This means that a predictive model of TB Kids index has met the required Goodness of Fit. New findings from research of this dissertation are: 1. Research Variable of social networks, social support and collective efficacy were associated with the incidence of Tuberculosis Children. 2. Produce Predictive Index Tuberculosis Children in South Kalimantan Province.

Keywords: Predictive Index, Tuberculosis Children, South Kalimantan Province.

1. INTRODUCTION

Indonesia tuberculosis in children aged <15 years at 8.8% of the total cases of tuberculosis, and 2-16% at the provincial level (WHO, 2012). Tuberculosis children in south Kalimantan province from 2009 s / d 2011 as many as 28 cases with BTA + age 0-14 years (DHO. Prov. Kalsel 2010, 2011 and 2012). Many patients do not do treatment about 10% each year (WHO, 2010), the figure is 8.8% of Tuberculosis Children of 3153, the Tuberculosis Children incidence rates in South Kalimantan is 241 cases / year. The cause of Tuberculosis incidence of children in South Kalimantan, which was adopted and modification of the theory of H. L. Blum (1984) in Suyono and Budiman (2011) is caused by various factors; includes behavioral, environmental (physical, biological and social), health care and herediter or descent. Tuberculosis child problem is not only determined by the contact with germs M.tb. which directly causes the disease or organ system failure, but also by social factors, behavioral, physical state house, nutritional status, immunization, herediter and health services. It is as it says Marmot MS. (2009), the Commission on Social Determinants of Health, declared "Human health is not only determined by the contact with microbes and toxins that directly cause illness or failure of an organ system, but also by other social and biological factors. Social culture also influenced the incidence of Tuberculosis children, there are certain cultures in addressing a sickness in society, both in times of illness and how the role of individuals, families and the local community in helping the sick when the incident occurred.

Social Network factors is a social network of friends of individuals with other individuals in the community who can certainly benefit from the relationship in both the social problems and issues to provide assistance to the sick. Then Social support factors the existing social support in the community as a result of existing social networks that will affect the help provided by individuals, families or communities. With good social networks and social support that exist in the community will lead to joint capabilities which help each other, mutual assistance in overcoming certain problems known as Collective Efficacy, which of course can be applied in dealing with tuberculosis disease. Risk factors for tuberculosis infection among other children are children exposed to adults active TB (sputum positive) in endemic areas, poverty, unhealthy environment (Rahajoe, NN., Basir, D., Makmuri MS., And Kartasasmita CB. 2008). Unhealthy environment particularly poor air circulation, temperature and high humidity favor the breeding of germs M.tb. Inside the house plus the tuberculosis bacteria in adult patients with sputum positive lots and diluted, and a cough that continue to cause germ removed by sprinkling coughing or when talking directly into the respiratory tract of children or circulating around where adult patients to do activities that course be a source of infection for those around him, especially the children. Children Tuberculosis transmission by contact adult patients with positive sputum. The results of the research that all children in contact with the parents of sputum positive Tuberculosis are infected, and stay for at least 8 weeks with active tuberculosis cases is enough to make a child age 1-15 years old are infected M.tb. (Lestari, P. 2011) and infected get sick or infected survive the conditions. Ratings success of tuberculosis using indicators: incidence, prevalence, mortality rates due to tuberculosis, the proportion of cases of tuberculosis, and the level of patient diagnosis. Based on this treatment of pulmonary tuberculosis only based indicator sick, it means that the indicator can be achieved after tuberculosis case itself, or the first new tuberculosis hospital treatment done. This will affect the transmission of tuberculosis disease if there are still people who do not go to health care or

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detected that they had tuberculosis. Based on the above theory and reality, the problem in this research is still high incidence of tuberculosis Children in South Kalimantan province. It is important to do research in predicting the incidence of tuberculosis preventive older child or before the pain so that the number of transmission and the incidence could be reduced.

2. RESEARCH METHODS

Research methods combined (mixed methods) with a combination of research model (Sequential Exploratory Design) qualitative approach to support quantitative and centered on quantitative, with a case control study. The sample size was 16 respondents qualitative research for interviews and 48 respondents for FGD. Number of sample quantitative research is 216 consisted of 62 cases and 154 controls sampling by purposive sampling qualitative and quantitative Multi-stage random sampling Cluster on 3 stages. The analysis technique used is descriptive qualitative and Confirmatory Analysis Factor, measure the latent variables by using path analysis with the program Linear Structural Relationships (LISREL) .and to determine the cut-off value of the index factor scores formula using SPSS-ROC.

3. RESULTS AND DISCUSSIONS

3.1 Results

Analyses were performed using path analysis by removing the strip is not significant, which is the path of Conduct (Y3) and lane Age Children (UA) and track Social Environmental Economics (X1) to track tuberculosis incidence of children (Y5), and lane Age Children (UA) to track R.Imun and Child Nutrition (Y4) and to track tuberculosis incidence Son (Y5) Based on the analysis of the final track, the final model predictive index tuberculosis Children are:

Knowing the significance of the relationship variables can be seen in Figure 2 below:

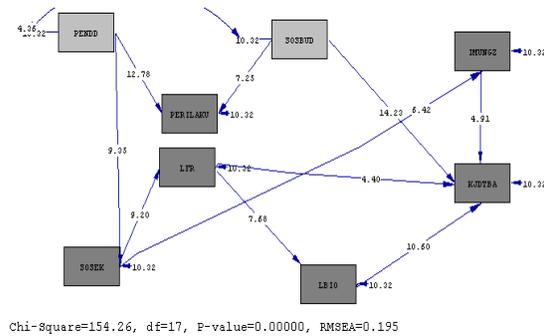


Figure 2: Model End (T values) Predictive Index Genesis tuberculosis Children

For more details can be seen in table 1 below:

Table 1 Results of Analysis Group Relations between Variables Exogenous and endogenous to the Late Model.

Influence	Γ	-value	Description
Education → LSE	0.34	9.35	Significant Influence
Edu → Behaviour	0.59	12.78	Significant Influence
LSB → Behaviour	0.34	7.25	Significant Influence
LSB → KTBA	0.52	14.20	Significant Influence

Next is the relationship with the endogenous variable are as follows:

1. Relationship between Socio-Economic Environment variables (X1) to history Immunization and Nutrition (Y4) and the Physical Environment variables House (Y1) worth significant with $t > 1.96$.
2. Relationship between Physical Environment variables House (Y1) with variable Biological Environment (Y2) and the incidence of tuberculosis Centre (Y5) worth significant with $t > 1.96$.
3. The relationship between the variables Immunization History and Status of Child Nutrition (Y4) with a tuberculosis incidence of the Child (Y5) worth significant with $t > 1.96$.
4. The relationship between the variables Biological Environment (Y2) with a tuberculosis incidence of the Child (Y5) worth significant with $t > 1.96$.

The results of the analysis group relationship between endogenous variables to endogenous variables is shown in Table 2 below:

Table 2: Results of Analysis Group Relations between Variables Endogenous and endogenous to the Final Model.

Influence	B	t- value	Description
LSE → RIGz	0.40	6.42	Significant Influence
LSE → LFR	0.53	9.20	Significant Influence
LFR → LBIO	0.47	7.58	Significant Influence
LFR → KTBA	0.19	4.40	Significant Influence
RIGz → KTBA	0.19	4.91	Significant Influence
LBIO → KTBA	0.44	10.60	Significant Influence

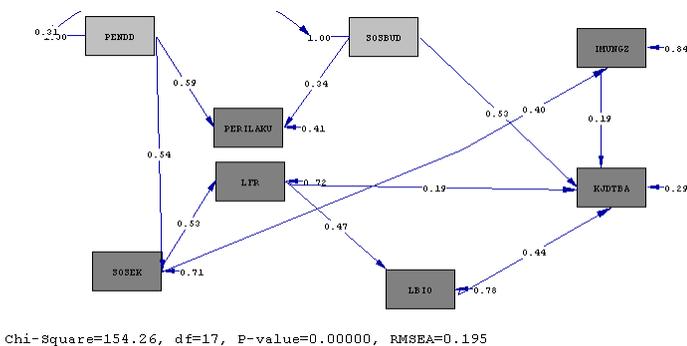


Figure 1 Model End (Standardized solution) Predictive Index The incidence of tuberculosis Children

The final model of the relationship between exogenous pathway with endogenous variables, as follows:

1. The relationship between the variables of Education (P) of the Economic Social (X1) and the Behavioral variables (Y3) worth significant with $t > 1.96$.
2. The relationship between the variables Socio-Cultural Environment (X2) on Behavior (Y3), and the incidence of tuberculosis Children (Y5) worth significant with $t > 1.96$.

Based on the analysis done by using path analysis on the model of the final index, the index factor score formula for predicting the incidence of child tuberculosis in South Kalimantan province are:

$$\text{Index} = 0.19 * \text{Home Physical Environment} + 0.44 * \text{Biological Environment} + 0.53 * \text{Socio-Cultural Environment} + 0.19 * \text{Immunization Status Child Nutrition}$$

Based on the test results with the cut-off value of ROC acquired SPSS Cut-off point at 4:36. with a sensitivity of 95.2% and 95.5% spesivitas and measurement accuracy is 95.4%. Implementation of the application of Predictive Index Kids tuberculosis in the field by using a form of tuberculosis Children's Predictive Index ratings. So to interpret the state of the risk of tuberculosis incidence Children under the following conditions:

1. Have a tuberculosis risk if the total score $\geq 4:36$
2. Children are at risk of tuberculosis if score $< 4:36$.

3.2 Discussion

Based on the results of the analysis of the final model using path analysis are shown in Fig 5.9 and drawing 9.10. then the index Model Predictive Kids tuberculosis in South Kalimantan, which is renewal this study is that the incidence of tuberculosis Children in South Kalimantan province affected by the Social and Cultural Factors, Environmental Factors Biological, Environmental Factors Physical Factors House and Immunization Status and Child Nutrition. For more clear as follows:

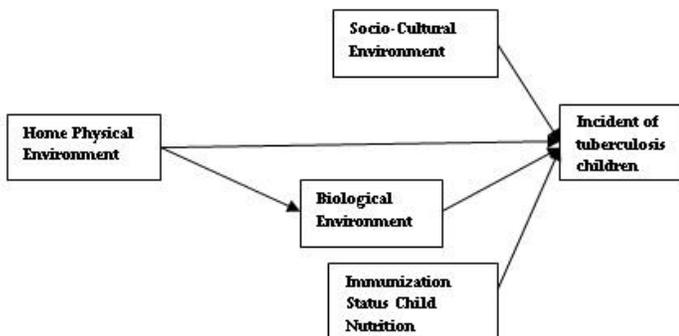


Figure 3 Model Predictive Index tuberculosis Children South Kalimantan Province

Based on the analysis performed the track indices Predictive Model tuberculosis incidence in children, factors that contribute to most environmental factors Socio-Cultural, then follow the biological environment, and the next is the physical environmental factors homes and Immunization History and Status of Child Nutrition. Why socio-cultural environmental factors are most affecting the incidence of tuberculosis in children. Socio-cultural factors that include social networks, social support and collective efficacy have positive influence on the incidence of child tuberculosis, meaning the better the socio-cultural, the number of tuberculosis children is increasing, and significant effect on the incidence of tuberculosis Children. It is clear that the socio-cultural context with tuberculosis incidence of children where the social network indicators of people who are always in touch, interact either individual, family or group then certainly at risk for contracting tuberculosis disease, as we know that tuberculosis

is a disease spread through the air on contact or talk with patients or people infected with tuberculosis micobacteryum germs. so that the great social network is a risk of transmission of TB in addition to having a positive benefit is that a lot of friends and be social support arising from the social network. Social networks in addition to having a positive impact on the friendship because it will get social support, but also has a negative impact in terms of development of the disease, where tuberculosis is a contagious disease so that when patients with less frequent contacts on tuberculosis will become sick. It is like saying Telfair TS., McDavid HK., Dean DH., (2010) social determinants determinants; housing, social networks and social support are key triggers (driver) the occurrence of HIV / AIDS, Hepatitis virus, STD and tuberculosis. So it is clear that social networking as a determinant and trigger of tuberculosis in children. The same thing is also said that social networks influence the disease by limiting or increasing exposure to disease agents transmitted through person to person contact, and with social networks the same simultaneously social network can improve your health and can disrupt (spoil) health if they are as a vector for the spread of disease infectious (Berkman L., F., 2002). Based on this social network will affect the incidence of tuberculosis children when existing social networks there are many adult patients or adult tuberculosis incidence rates in the region is high, which of course can infect others. But despite the high social networks but tuberculosis incidence rates are lower course the positive impact of social networking more on social support and not on the negative impact that is infected with tuberculosis disease. Then the social indicators of public support of tuberculosis disease in which they provide social support form Emotional support: drove to the hospital, to visit, participate wait for patients in the hospital. Support Information: brainstorm problems of disease, recommends to the clinic, give advice to the health center / hospital. Instrumental support; community support in the form of aid workers, drove to the hospital with a motorcycle / car, give money, get drugs, helps clean the house which the sufferer to be left to the hospital. Choice Support: with the words "Thank God my mother took her son to the clinic quickly" ., against family members who get tuberculosis (qualitative research results, 2013). Social support to individuals, families, neighbors and communities. those who did not want medical treatment be willing to seek treatment, because the community provides support information about the disease to be treated, even if patients with tuberculosis do not have the means to go to the health center or hospital it will be delivered, and given enough money or made a note of poor or obtained my letter jamkesmas, Jamkesda because usually people with tuberculosis are those who can not afford. This calls according to research Hargreaves JR., Baccia D., CA. Evans, Adato and Petticrew M. (2011) that led to a significant socioeconomic barriers to delay their treatment to health services is a lack of social support when they are sick and seeking treatment , So with good social support and appropriate to people with tuberculosis to seek treatment, the incidence of tuberculosis disease can be reduced or declined. According Kawachi and Berkman (2000) the structure of network relationships affect health through the provision of social support, although not all supportive relationships. High social support from individuals, families, neighbors and communities against tuberculosis children then rapidly diagnose tuberculosis cases will be obtained and discovery for the treatment of tuberculosis cases

can be run properly. So with high support against those suspected of having tuberculosis disease to be checked into the clinic or hospital then of course have an impact on tuberculosis case finding increased, so that socio-cultural relations in the context of social networks, social support and capabilities together in addressing the tuberculosis disease will lead to the discovery of a case increased. Biological environments into two after a big influence social and cultural environment for the occurrence of tuberculosis in children, it is because that biological factors in this study is tuberculosis contacts. Children who live with parents who suffer from tuberculosis has a very big risk for the occurrence of tuberculosis. Because children are always exposed to the germs M.tb. which occurs every time the patient coughs or sneezes, people spread germs into the air in the form of droplets (droplet nuclei) and a cough produces droplets 3000 (MOH., RI. 2006). So that children are always contacts old and live with the possibility of a greater risk of transmission and will be infected with the bacteria M.tb. this was confirmed by research Lestari P. (2011) all household contacts of children who become infected with tuberculosis patients, which in turn is diseased or infected survive the conditions. The same thing is based on the results of research that toddlers who live with adult patients have a significant relationship with the incidence of tuberculosis (Mulyadi D., 2003). Based on the results of a predictive model of tuberculosis children index that the incidence of tuberculosis in children occur because of the physical environment of the home or homes that do not meet health requirements. As well as the state of the room temperature is that it can affect a person's health or its occupants, the temperature is too high may affect health such as dehydration, fatigue and discomfort due to sweaty, but the temperature is too cold is also detrimental to health. Temperatures qualified home health is between 20-25 ° C, in (Gunawan, 2009) and 18°C-30 °C, in (MOH, 2005). According Lennihan and Fletter (1989) says that the temperature of the house that do not meet health requirements will increase body heat loss, thereby decreasing the body's vitality and predispose to infections, especially respiratory tract infection by infectious agents. According Gout & Brooker (2003) that the bacteria *Mycobacterium tuberculosis* will grow optimally at temperatures of 31-37 ° C. so that when the temperature of the bedroom did not meet the health requirements to be susceptible to bacterial infection. Humidity factor bedroom also fails to satisfy the health requirements may affect its inhabitants, living room and bedroom that do not meet health requirements actually help the growth of microbes and the greater the probability of transmission of TB. Tuberculosis bacteria can survive several hours in the dark and damp with no sunlight (ultraviolet light) to kill the germs of tuberculosis. High humidity of the room would be a good medium for bacterial growth and breeding of pathogens, including tuberculosis germs (Notoatmodjo 2003). Likewise with ventilation, ventilation is very important to regulate the passage of air into the bedroom so there's room to sleep the air will be fresh and free of germs. Ventilation that does not meet the health requirements will affect the temperature and humidity in the bedroom. As Notoatmodjo (2003). In addition, the second function is to free air ventilation of indoor bacteria, particularly pathogenic bacteria such as tuberculosis, because there are always going airflow continuously. The bacteria are carried by the air will always flow, so the air is fresh and free from germs. In addition, according to Lubis (1989), wide vents

that do not meet health requirements will lead to obstruction of the process of exchange of air flow and sunlight into the house, consequently the germs of tuberculosis that is in the house can not come out and join sucked along with air breathing. Lighting factor which also affects the health of sunlight into the house or bedroom may prevent a hazard breeding grounds for tuberculosis germs, according to the Department of Health (2002) tuberculosis bacteria can only be killed by direct sunlight. So the bedrooms that do not meet health requirements in terms of sunlight, so at risk of tuberculosis. Residential density is one house physical environmental factors that influence the incidence of tuberculosis. Residential density or "crowding" cause negative effects on physical health, mental or moral. The spread of communicable diseases in overcrowded homes faster (Lopez, 2002). Based on the research results Rahmawati (2008), in HSS Kalsel that there is a significant relationship between the density of inhabitants with tuberculosis incidence and TB risk it happened with the residential density bedrooms are ineligible 2.5 times greater than the density of residential houses with bedrooms, qualify. Type of house floor and walls of the house is very important for health, floors were wet and dusty is a nest of disease (Notoatmodjo, 2003) and Wall qualified home health either of wood, brick or concrete block that has been cemented or concrete walls to prevent soil moisture to the wall ride home so the house becomes high humidity, air humidity increases is a good medium to facilitate the breeding of pathogens including bacteria (Notoatmodjo, 2003). The influence of the physical environment of the house of tuberculosis incidence widely demonstrated from several studies, such as by research Rusnanto, Rahmatullah P, Udiono A, (2006) that the humidity of the bedroom, ventilation bedrooms, has a significant relationship with the occurrence of pulmonary tuberculosis. Further research Fatimah, S., (2008) that the temperature, humidity, ventilation, lighting and wall types are associated with the incidence of pulmonary tuberculosis. And according to Hargreaves JR., Baccia D., CA. Evans, Adato and Petticrew M. (2011) that poor ventilation, overcrowding home can increase the likelihood of individuals who are not infected with tuberculosis infection. Factors Immunization History and Nutritional Status. Why immunization history and Nutritional Status of Children's effect on the incidence of tuberculosis. Children who are immunized will be immune (imunnitas) against a disease. So that children are given BCG can reduce tuberculosis infection is quite effective and can prevent TB in children up to 80%, so with the BCG immunization of children had a body of active immunity against infection M.tb. Nutritional factors in children is also very important, because a good nutritional intake in children can increase the body resistance so it is not susceptible to disease. While the lack of nutritional intake can lower the immune system making it easy attacked diseases such as Tuberculosis. Based on the results Risesdas 2007, prevalence of malnutrition and lacking in South Kalimantan still reached 26.6% (range 17 to 35.6%), most districts / cities (11 of 13) have not yet reached the national target to improve nutrition in 2015 and the target MDG for Indonesia 18.5% (Risesda 2007) and the data of 2010 South Kalimantan poor nutrition and less 16.8 6.0 (Indonesia malnutrition 4.9 and less than 13.0) (Risesda 2010). In this study, the index is used to predict the incidence of child tuberculosis in South Kalimantan, which would use is more on the preventive aspects of tuberculosis incidence of children. So that the area /

community residences with a social culture that has a high social networks have a high risk for the occurrence of cases of tuberculosis in children. So also with high social support in terms of providing advice, information about tuberculosis disease of children, and said to go for treatment to a health center / hospital if there are suspected of having TB in children so awareness for the check-up and go to the health center / hospital is the right thing so the numbers of children tuberculosis findings will be increased, which is certainly the case in the future with the present invention is high then it will decrease the incidence of tuberculosis children.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

1. There is a significant relationship between social and cultural environment variables on the incidence of child tuberculosis.
2. There is the influence of the physical environment of the house with the biological environment and the incidence of child tuberculosis.
3. There is influences of Immunization history and Nutritional Status of Children with tuberculosis incidence variable Son.
4. There is a biological environment influence children with tuberculosis incidence.
5. Based on the path analysis is done, the index factor score formula for predicting the incidence of child TB is $\text{index} = 0:19 * \text{Physical Environment} * \text{Home} + 0:44 + 0:53 * \text{Biological Environment} * \text{Social Environment} * \text{Culture} + 0:19 * \text{Status Immunization and Child Nutrition}$.

4.2 Recommendations

1. High social networks, social support and the ability to have shared in the community, then it can be managed properly to perform handlers tuberculosis children disease eradication. by empowering local communities to cope with tuberculosis disease of the Child.
2. In Children prevent further escalation of tuberculosis in South Kalimantan Province, in priority the eradication of tuberculosis Children can use the index prediktive tuberculosis incidence Son, so that more focused on areas that are at risk of child tuberculosis.
3. Need to do similar research that emphasizes the predictive index tuberculosis Children of other aspects to complement this research study.

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