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## Research Article

# Perceived of Healthcare Utilization by Adult Pulmonary Tuberculosis Patients for their Children in Yogyakarta

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## Abstract

**Background and Objective:** Adult tuberculosis (TB) awareness was rarely evaluated as their TB transmission impacted their household children. This study aimed to assess the perception of healthcare delivered to children by the adults with TB in their household.

**Methodology:** This study observed 132 respondents, with a case control study. The study sample and population consisted of adults with recorded TB and/or who had been or were being treated for TB and/or were already recovered from TB and had delivered or not delivered their children (0-14 years old) to/from a healthcare facility. The study lasted from January-December 2014 and covered eight referred TB hospitals in Yogyakarta Special province. The bivariate (chi-square test) and multivariate (multiple logistic regression) were analyzed using SPSS Version 13. **Results:** Adults with TB who delivered their children to healthcare facilities perceived (through bivariate analysis) the following: ease of access to state hospital ( $\rho = 0.202$ ), private hospital ( $\rho = 0.745$ ), health center ( $\rho = 1.107$ ) and general practitioner/private clinic ( $\rho = 0.714$ ). Perceived of ease of access the state hospital was the only variable that predicted ( $\rho = 0.028$ ) adult TB who delivered their children by multivariate analysis (OR = 4.98). **Conclusion:** Children were more delivered to state hospitals than others healthcare facilities as impacted by the perception of ease of accessibility by their adult with TB in Yogyakarta Special province. This result is also supported by buffering spatial analysis.

**Key words:** Tuberculosis, perception, healthcare utilization, child health, infectious disease

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**Competing Interest:** The authors have declared that no competing interest exists.

**Data Availability:** All relevant data are within the paper and its supporting information files.

## INTRODUCTION

Passive case finding was the gold standard in national TB mitigation programs that included TB incidence tracing of the child population. The directly observed TB treatments (DOTS) strategy, which was adopted by WHO<sup>1,2</sup>, had powerful implementation of the successful treatment of TB patients in developing countries<sup>3,4</sup>. However, it rarely evaluated of active TB cases with significant findings.

The WHO published guidelines for active TB case finding that included contact tracing for TB transmission in households and the general population<sup>5</sup>. Contact tracing aimed to prevent TB transmission by investigating the vulnerable or TB suspects among either symptomatic TB (latent TB infection) or diagnosed TB patients<sup>6,7</sup>.

In developing countries, parents or adults with TB usually indicated they most likely checked their health at secondary health facilities, rather than through primary healthcare<sup>8</sup>. Although, it had not happened in children specifically, families, especially mothers, delivered to healthcare their children if they considered it necessary. Mothers were more likely to go to a pediatrician or advanced health professional than a general practitioner if their child had a cough or gastrointestinal symptoms that generally indicated TB<sup>9</sup>.

Health seeking behaviors indicated that family or parents, especially mothers, will seek the best treatment for their children in the symptomatic phase of this disease<sup>8,10</sup>. Indeed, mothers rarely delivered their children when the disease was asymptomatic or at an early stage<sup>11-13</sup>. Therefore, most children with TB were delivered to health facilities when they became unhealthy or the condition became severe<sup>14</sup>. This study aimed to explore health seeking behaviors through the perception of health facilities utilization of adults with TB for their children, in urban and rural settings in Yogyakarta Special province, Indonesia.

## MATERIALS AND METHODS

**Study design and setting:** A case control study was designed to explore 132 of 350 adult TB sufferers. The population's diagnostic history was proven by health professionals to determine the period of TB transmission and the mechanism<sup>15</sup>. Subject in this study was defined as a TB patient who was being treated or had already recovered from TB, who lived in a home with children aged 0-14 years old. The study lasted from January-December, 2014 and covered eight referred TB hospitals in Yogyakarta Special province. This included immediate family members (father, mother, sister or brother)

or other extended family members (grandmother, grandfather, aunt, etc.) who lived in the same home during the period of TB transmission that impacted the children.

**Data collection method:** In this study, healthcare facilities were measured by knowledge of their availability, time needed and affordability. Adults with TB who delivered their children to healthcare facilities were compared with adults with TB who had not delivered their children to healthcare facilities. Information bias was controlled through a valid and reliable data collection tool that was modified from a previous study questionnaire<sup>5,15-17</sup>.

**Data analysis:** The bivariate (chi-square test) and multivariate (multiple logistic regression) were analyzed using SPSS version 13, which was licensed by the Faculty of Public Health, University of Indonesia. This study also conducted spatial analysis to support multivariate analysis that explained health seeking behaviors with geographic estimation<sup>18</sup>. Secondary data by Case Notification Rate (CNR) was gathered to discuss any evidence found in this study.

**Ethical approval:** Informed consent from the respondents was obtained in written form. Ethical approval of the study was obtained from the Expert Commission on Research and Research Ethics of the Public Health Faculty of Indonesian University, No. 87 /H2.F10/PPM.00.02/2014.

## RESULTS

Healthcare utilization status, whether delivered or not-delivered to healthcare, was derived from each of health facilities register data reported (TB-01 form). Table 1 shows the baseline characteristic of this study.

Table 1 shows middle economic status of respondent was the higher household characteristic (40.2%) than others. Respondent with middle economic was higher either in delivered (34.8%) or not-delivered (45.5%) their children to healthcare than other economic status. It showed the same event that happened on low education level and unemployed of occupational status. Low education respondent was higher either in delivered (56.1%) or not-delivered (59.1%) their children to healthcare than other educational level, while unemployed respondent was higher either in delivered (56.1%) or not-delivered (59.1%) their children to healthcare than other occupational status. It indicated that were no difference between either economic status, education level nor occupational status of adult TB in order to delivering their children to healthcare (Table 1).

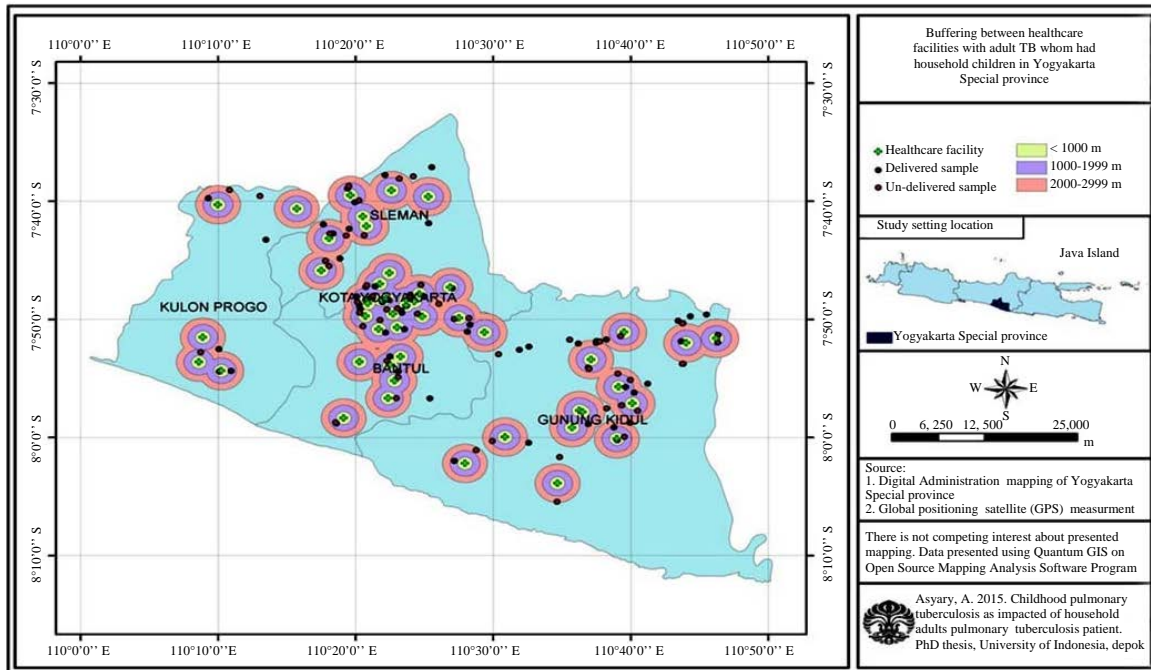


Fig. 1: Buffering between healthcare facilities for adults with TB who had children at home

Table 1: Baseline characteristic of study

Parameters	Delivered to healthcare (n = 66)		Not delivered to healthcare (n = 66)		Total (n = 132)	
	No.	%	No.	%	No.	%
<b>Economic status</b>						
Poor	15	22.7	11	16.7	26	19.7
Middle	23	34.8	30	45.5	53	40.2
Middle upper	16	24.2	10	15.2	26	19.7
High	12	18.2	15	22.7	27	20.5
<b>Education level of adult with TB</b>						
Low	37	56.1	39	59.1	76	57.6
High	29	43.9	27	40.9	56	42.4
<b>Occupation of adult with TB</b>						
Housewife/unemployed	9	13.6	14	21.2	23	17.4
Unemployed worker	44	66.7	44	66.7	88	66.7
Employee	13	19.7	8	12.1	21	15.9

The most frequently report of health seeking behavior of adult with TB who had delivered their household children are presented in Table 2. It shows the results of chi-square test and multiple regression logistic test. Although, chi-square ( $\chi^2$ ) results of all variables, that consisted of perception of state hospital accessibility, perception of private hospital accessibility, perception of health center (Puskesmas) accessibility and perception of General Practitioner (GP)/clinic accessibility, had no significant of adult TB who had delivered their household children, it still could be proceeded. However, only the perception of state hospital accessibility carried on in the multivariate analysis with  $p < 0.25$ . Multiple regression logistic results perception ease of access of state hospital as

the primary predictor to determine adult TB who had delivered their household children.

Figure 1 is based on spatial analysis showed healthcare facilities were buffered by all respondents. Most of (10.61%) the respondent were not approached, while the rest (118 or 89.39%) saw healthcare facilities as accessible.

## DISCUSSION

The healthcare utilization behavior of the community at large was affected by accessibility. Accessibility made people consider whether to utilize the facility or not, especially whether or not a parent took their children there. This

Table 2: Health seeking behavior of adults with TB who had delivered their household children

Parameters	Not delivered to healthcare (n = 66)		Delivered to healthcare (n = 66)		Total (n = 132)		Bivariate analysis			Multivariate analysis		
	No.	%	No.	%	No.	%	OR <sub>crude</sub>	95% CI	p-value	OR <sub>adj</sub>	95% CI	p-value
<b>Perception of state hospital accessibility</b>												
Difficult	22	59.5	24	43.6	46	50.0	1.894	0.813-4.412	0.202	4.98	1.189-20.833	0.028
Easy	15	40.5	31	56.4	46	50.0						
<b>Perception of private hospital accessibility</b>												
Difficult	8	44.4	11	55.0	19	50.0	0.655	0.182-2.356	0.745	NA	NA	NA
Easy	10	56.6	9	45.0	19	50.0						
<b>Perception of health center (Puskesmas) accessibility</b>												
Difficult	33	51.6	25	49.0	58	50.4	0.934	0.530-2.311	1.107	NA	NA	NA
Easy	31	48.4	26	51.0	57	49.6						
<b>Perception of private GP/clinic accessibility</b>												
Difficult	11	50.0	7	58.3	18	52.9	0.714	0.173-2.954	0.916	NA	NA	NA
Easy	11	50.0	5	41.7	16	47.1						

study showed that parents with TB were more likely to deliver their children to a state hospital rather than other healthcare facilities (OR<sub>adj</sub> = 4.98) if ease of accessibility was perceived.

Children not taken to healthcare facilities were not only more likely to have undetected TB (and thus miss early treatment) but also had a higher opportunity to suffer from severe TB symptoms, such as mortality, than the adult population. Moreover, childhood TB is more harmful when transmitted by adults with TB through household contact.

Fortunately, the study revealed that adults or parents with TB were more likely to deliver their children to a state hospital when they felt their disease harmed their children. State healthcare facilities included health centers (Puskesmas) and state hospitals in Indonesia, especially in the Yogyakarta Special province, which held passive case findings for the TB mitigation program. These facilities had been conducting TB diagnosis by the clinical sputum assessment for adults (>14 years old) and the scoring system for children (<14 years old) as the clinical pathway since 2011. This enabled all suspected TB cases (household contacts) to be identified with the TB-01 form and examined for TB assessment. Thus, TB treatment for children who lived with adults who had TB was delivered sufficiently in state healthcare facilities. However, this was insufficient in GP practices or clinics and private hospitals in this study.

It is usually hard to conduct a TB mitigation program in a GP practice or private clinic/hospital setting. Although the government has tried to endorse system regulation, it has always been unable to achieve beneficial TB reports and data management for TB mitigation, especially in developing country settings. Instead, childhood TB has been neglected and a large amount of population transmission has occurred. Children have more sensitively to TB symptoms than adults, suffering from failure to thrive, fatigue and intense fever<sup>13</sup>. The community and environment where the children and their family live also affect healthcare utilization<sup>19</sup>. The health seeking behavior of adults for their children did not only come from adults with TB but also from a conflicted parent or other adults who lived in the same house or were the child's caregivers.

Households in urban settings behaved differently from households in rural settings. In an urban setting, children, especially those under five years old, were usually not cared for by their mother or father. It usually cared by caregiver, specifically those under five children. Unfortunately, only 50% of caregivers claimed they would deliver children to healthcare facilities if the children had a cough. In contrast, 63% bought medicine from a drug shop or pharmacist and

gave it to children with a fever and 37% did the same for children with a cough<sup>20</sup>. Conversely, the health seeking behaviors of rural households were affected by various factors: cultural faith and perceived morbidity and severity<sup>21</sup>, as well as village location, sex, family expenditure and out of pocket costs<sup>22</sup>.

The study described the low CNR for TB indication in Yogyakarta Special province. Adult TB patients had an awareness according to precaution programs for their children. The CNR of Yogyakarta Special Province was described as the lowest of the other provinces in Indonesia (55 found and recorded incidences in populations of 100,000 were reported)<sup>23</sup>. In other words, Yogyakarta Special Province is not an endemic location for this disease<sup>24</sup>.

In spatially perspectives, buffering analysis held on each of healthcare facilities. Buffering assumed a 1 kilometer cut-off point from the health center (Puskesmas) working area and 5 km for the hospital working area<sup>25</sup>. This showed that TB transmission should be prevented in the population as most of the healthcare facilities were accessible. These results were significant in statistical analysis. However, this study limitation showed inaccessible healthcare might become accessible to access with. This study was unable to show line-polygon as road infrastructure variable those connected the area among subjects. Inaccessible healthcare facilities might become accessible through paved roads and might then be defined as in closer proximity. However, the study was set in West Indonesia, particularly in Java Island, which has massive development and minimum geographical barriers compared to East Indonesia.

## CONCLUSION AND FUTURE RECOMMENDATION

This study implied not only the perception of ease of adults with TB in delivering their children to healthcare facilities in Yogyakarta Special province but also proved a real-world condition using spatial analysis. Further research is recommended to evaluate TB mitigation programs as government policy in the public health perspective.

## SIGNIFICANCE STATEMENTS

This study discovered both the demand (a person's perception) and supply (healthcare facilities' location influenced place and time) needed for the access of what can be beneficial for a TB mitigation program with location-based management. This study will help the researcher to uncover the critical area of public health perspectives on TB

transmission, in particular to protect children from transmission, which researchers have not been able to explore. These findings lead to the increase of knowledge in the community through a new theory on childhood TB prevention which are essential for TB control more effectively.

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