

Having More Access Leads to Better Welfare: Study of Access for People with Disabilities (PwD) and Its Spatial Impact



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Abstract Disability groups are included in vulnerable groups who need special assistance to improve their quality of life. One of the most important things needed for persons with disabilities is the existence and ease of access to various sectors such as health and education. This study aims to see how the influence of the existence of disabilities on welfare and how the existence of access can improve the welfare of persons with disabilities in the region and in the surrounding area. Using the OLS regression model at the household and district/city levels, the result shows that to date people with disabilities are still a negative factor for welfare and the existence of access to health insurance, education and health facilities for disabilities can improve the welfare of their group. Meanwhile, the Spatial Autoregressive Model shows the existence of access to good health and education facilities in an area can improve the welfare of persons with disabilities in the surrounding area that is close to their home area. Whereas, the impact for other areas as a whole only applies to health facilities and access *to health insurance*.

Keywords Disability • Disability Access • Spillover • Spatial • Impact

1 Introduction

According to Indonesia Law No. 8/2016, persons with disabilities are people who have various types of limitations such as physical and non-physical limitations. Non-physical limitations are divided into several types, namely mental, sensory, and intellectual. Meanwhile, according to Indonesia Law No. 39/1999, groups of people with disabilities are one of the groups entitled to receive more treatment and protection than non-disabled groups, especially in the education, health, and employment sectors.

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Based on data from the National Socio-Economic Survey (SUSENAS) 2019, the percentage of persons with disabilities in Indonesia is in the range of 9–10% of the total population. The large percentage indicates that persons with disabilities have a significant role in the economy and have the opportunity to help improve national welfare. However, limitations for persons with disabilities to carry out economic activities even non-economy make the contribution of this group not optimal [10]. In addition, these limitations also bring disabilities and families who have members with disabilities into lower economic status compared to non-disabled people. According to research conducted by Bella and Dartanto [1] in Indonesia, a family whose head of household is a person with a disability has the opportunity to become less prosperous. Moreover, not only the head of the household, everyone who falls into the group with disabilities has a lower life indicator than non-disabled people [7]. This explains that families with household members with disabilities regardless of their role, are still unable to independently promote the welfare of their families which results in inequality in welfare between groups with disabilities and non-disabled people. One of the reasons for the emergence of this incident is the limitation of movement or space for persons with disabilities [7]. To increase the contribution of groups with disabilities and reduce existing inequalities, one thing that can be done is to provide access for groups with disabilities by the government to various sectors that have been previously mentioned [10].

Access for persons with disabilities in Indonesia for each region is still very diverse, this is due to differences in regional focuses and priorities in directing policies towards increasing access for persons with disabilities. Table 1 shows a picture of the unequal availability of access for persons with disabilities in Indonesia. Focusing on access to the education sector, based on 2019 SUSENAS data, the difference between the highest and lowest disability participation rates at the district/city level is 87%. Regarding access to health, the difference in the ratio of disabilities with the highest and lowest health insurance coverage is 76.28%, while in the calculation of the number of disabilities per one hospital, the highest area is 65,425 disabilities per hospital and the lowest is 660. Still, in the same source, it can be shown that the difference in regions based on the ratio of disabilities who have jobs is 74.63%. Of these four indicators, regional disparities in managing access for disabilities are still very diverse, and this provides different benefits according to the availability of access they have.

Table 1. Description of access inequality for disabilities in the regions based on education, health, and employment indicators

	School participation rate (%)	Health insurance ownership ratio (%)	Job ownership ratio (%)	Disabilities per one hospital
Lowest	13	23.72	25.37	660
The highest	100	100	100	65,425
Difference	87	76.28	74.63	64,765

Source SUSENAS 2019, compiled

The purpose of this study is to measure how the current contribution of disabilities to the national economy and what factors can improve the welfare of persons with disabilities at the household, regional, and other regional levels. Based on these objectives, the following analysis will be carried out: (1) the impact of the existence of disabilities on household and regional welfare; (2) the impact of having access to education, health, and employment for disabilities on household and regional welfare; (3) spillover effect of the impact of the presence of disabilities in one area on other areas.

2 Data and Methodology

2.1 Data Sources & Method of Analysis

The scope of observation in this study is Indonesian country. The data used in this study are individual and village data from the National Socio-Economic Survey (SUSENAS) KOR March 2019 and Village Potential (PODES) 2018. SUSENAS and Village Potential are data sourced from the Central Statistics Agency (BPS), where the survey was conducted twice a year for SUSENAS and once every 4 years for Village Potential. In general, SUSENAS data is the main data source used in this study. Several variables are used as proxies for socio-economic, education, health, and several other indicators. This study uses the Village Potential data variable in the number of hospitals in the area. Referring to these data, the method used in this study is an empirical quantitative model divided into household and districts level explained in each section. Moreover, this study also tries to describe how the social impact of having access to disabilities in one area on the welfare of other areas.

2.1.1 Household Level

An empirical model at the household level is carried out to see how disability contributes to household welfare, as well as what factors can affect the welfare of households with disabilities themselves. The household-level empirical model uses an econometric approach, namely Ordinary Least Square (OLS) regression. OLS is a simple regression model that is generally used to measure how one variable changes to another [12]. The OLS equation used in the study is as follows:

$$\ln \text{percapita expenditure}_i = \beta_0 + \beta_1 D.\text{disability}_i + \beta_n \text{Control_variable}_i + \varepsilon_i \quad (1)$$

The dependent variable of the OLS equation is the natural logarithm of per capita household expenditure, the use of natural logarithms is intended to reduce the variance of per capita household expenditure. Meanwhile, the main independent variable used was the presence of disabilities in the family, followed by several other control variables.

After seeing how the impact of the existence of disabilities on household welfare, equations are then formed to see what factors can improve the welfare of families with disabilities. This is intended to analyze the main factors that can improve the welfare of families with disabilities. Still in the OLS and logistic regression methods, the equation used is as follows:

$$\begin{aligned} & \text{In percapita expenditure (for HH with Disabilities)}_i \\ &= \beta_0 + \beta_n \text{Disability access} + \beta_n \text{Control_variable}_i + \varepsilon_i \end{aligned} \quad (2)$$

2.1.2 District Level

Apart from conducting analysis at the household level, this study also attempts to conduct analysis at the district/city level. The purpose of this analysis is to see how the role of disabilities in the overall welfare of the region and what factors can improve the welfare of disabilities from a regional perspective, in this case, is the district/city level. This was done using SUSENAS 2019 data juxtaposed with Village Potential 2018.

There are 4 indicators used to measure access for persons with disabilities in the regions: (1) working disability ratio; (2) high availability of health insurance for persons with disabilities; (3) the existence of health facilities compared to the high number of persons with disabilities; (4) high school participation rates for persons with disabilities. Some of these indicators have represented access to disabilities from various sectors, such as the health, education, and employment sectors.

2.1.3 Spillover Effect

In addition to regression analysis at the household and regional level, this study also seeks to see how the effect of having access to persons with disabilities affects the welfare of disabilities in other areas. In conducting this analysis, the most appropriate model to use is the Spatial Autoregressive Model [4]. The purpose of the SAR model in general is to see the spatial impact of exogenous/independent variables on a dependent variable in other areas [8]. In the SAR model, the equation used is as follows:

$$\text{Outcome}_i = \beta_0 + \beta_1 X_i + \gamma 1 \sum_{j=1}^N W_{ij} * X + \varepsilon_i \quad (3)$$

There is a big difference between the linear regression equation and SAR, namely in the existence of the spatial matrix itself. The notion of a spatial matrix or what is generally called a weighting matrix is the separation of the places of each individual who are in different places. This is done so that each individual can see how much influence s/he has on other individuals [9]. The following is an illustration of the matrix that will be used.

Table 2 shows an illustration of the spatial matrix in 4 regions, where the sign “*” is the magnitude of the influence of one area on another. In this case, area B is indicated to affect region A, even for C and D. In the spatial analysis, there is no difference with the Eq. 3 analysis (Table 3).

Table 2 Spatial Matrix Illustration

	Area A	Area B	Area C	Area D
Area A	0	*	0	0
Area B	*	0	0	0
Area C	0	0	0	*
Area D	0	0	*	0

Source Author

Table 3 Variables and models used in the analysis

Variable	1st equation: disability to HH welfare	2nd equation: disability access to HH disabilities welfare	3rd equation: disability to district welfare	4th equation: disability access to disability district welfare	5th & 6th equation: local and global spatial analysis
<i>Variables represent disability</i>					
Household with disabilities person	Yes				
Ratio of disability/ population			Yes		
<i>Variables represent the access of disability</i>					
Disability work (1 = yes)		Yes			
Disability attending school (1 = yes)		Yes			
Disability healthcare (1 = yes)		Yes			

(continued)

Table 3 (continued)

Variable	1st equation: disability to HH welfare	2nd equation: disability access to HH disabilities welfare	3rd equation: disability to district welfare	4th equation: disability access to disability district welfare	5th & 6th equation: local and global spatial analysis
Ratio of working disability				Yes	
High ratio of school disabilities participation (1 = yes)				Yes	Yes
High ratio of having healthcare disability (1 = yes)				Yes	Yes
High number of disabilities on 1 health facilities (1 = yes)				Yes	Yes
<i>Control variables (in ratio to population if district level)</i>					
Average year schooling	Yes	Yes	Yes	Yes	Yes
Working	Yes		Yes		
Electrification	Yes	Yes	Yes	Yes	Yes
Healthcare	Yes		Yes		
Health facilities			Yes		
School participation disability			Yes		
Urban	Yes	Yes			
Household number	Yes	Yes			

Source Author

3 Result and Discussion

The results section of the analysis and discussion will be divided into 3 parts, namely the impact of disability on households and regions, the existence of disability access to the welfare of the group, and the impact of the existence of disability access for other areas.

3.1 The Existence of Disabilities on Household and Regional Welfare

In models 1 and 3 with the aim of seeing the effect of disability on total welfare, the results show that in 2019, the existence of disabilities in Indonesia still has a negative impact on total welfare. In Researchers of [1] also stated that the existence of disability in Indonesian household reduces the level of family welfare, it can also increase the chances of the family falling into the poor category. Referring to the estimation results for 2012 and 2019 which have not changed, this confirms that the negative impact of the existence of disabilities has yet to be resolved or reduced by the policies that have been established. In the case of Indonesia, one of the reason the implementation of disabilities regulation not implemented optimally because the lack of information about what disabilities need most [3]. Some of other reasons why the changes did not occur are that even though the policy was established, the policy did not have a large focus on tackling the groups with disabilities problem [2]. In addition, the existence of access that does not support mental and physical disabilities is another cause of one of the things that makes the lives of persons with disabilities lower, in education and employment as well [10, 11] (Table. 4).

3.2 Availability of Access for Persons with Disabilities to the Welfare of Their Group

In models 2 and 4, an analysis is carried out to see how the impact of the availability of access on the welfare of groups with disabilities. The results of the analysis show that at the household level, disabilities who have a job can significantly increase the average welfare of their household. Apart from working, disabilities who have health insurance and attend school also have an equally positive and significant contribution to the welfare of households with disabilities. Not different from household results, results at the regional level also show the same thing. The average expenditure per capita of disabilities in a district/city can be increased significantly if the region experiences: (1) an increase in the ratio of persons with disabilities to work; (2) has a disability health insurance ownership ratio that is above the average; (3) has above average school participation rates for

Table 4 Regression results for the 6 models used

Variable	1st equation: HH level	2nd equation: HH level	3rd equation: District level	4th equation: District level	5th equation: Local spillover	6th equation: Global spillover
<i>Variables represent disability</i>						
Household with disabilities person	−0.034*** (0.002)					
Ratio of disability/ population			−1.708*** (0.310)			
<i>Variables represent the access of disability</i>						
Disability work (1 = yes)		0.030*** (0.002)				
Disability attending school (1 = yes)		0.050*** (0.008)				
Disability healthcare (1 = yes)		0.051*** (0.040)				
Ratio of working disability				0.210* (0.131)		
High ratio of school disabilities participation (1 = yes)				0.040** (0.020)	0.102*** (0.037)	0.0001 (0.000)
High ratio of having healthcare disability (1 = yes)				0.067*** (0.023)	0.031 (0.032)	0.0002* (0.000)

(continued)

Table 4 (continued)

Variable	1st equation: HH level	2nd equation: HH level	3rd equation: District level	4th equation: District level	5th equation: Local spillover	6th equation: Global spillover
High number of disability on 1 health facilities (1 = yes)				−0.087*** (0.024)	−0.082** (0.037)	−0.0003** (0.000)
<i>Control variables (in ratio to population if district level)</i>						
Average year schooling	0.071*** (0.000)	0.072*** (0.000)	0.140*** (0.012)	0.121*** (0.015)	0.014 (0.019)	0.0003** (0.000)
Working	0.043*** (0.001)		0.820*** (0.1715)			
Electrification	0.119*** (0.005)	0.147*** (0.010)	0.186 (0.127)	0.020 (0.230)	−0.124 (0.152)	−0.0002 (0.000)
Healthcare			0.154*** (0.051)			
Health facilities			−0.000*** (0.000)			
School participation disability			0.042 (0.058)			
Urban	0.181*** (0.002)	0.150*** (0.003)				
Household number	−0.139*** (0.000)	−0.119*** (0.000)				
Constant	13,560*** (0.006)	13,444*** (0.004)	12,284*** (0.139)	12,559*** (0.259)		
R-square	0.33	0.29	0.55	0.37	0.39	0.37
Number of observations	315,672	87,543	496	514	492	492

Robust standard errors in parentheses *** p < 0.01, ** p < 0.05, * p < 0.1

persons with disabilities; (4) has a low ratio of disability rates in one hospital. Through ownership of access proxies for persons with disabilities, based on the above estimates, each region will experience an increase in the welfare of the disabled group.

The existence of access for persons with disabilities in Indonesia is indeed the best solution to improve the welfare of these vulnerable groups. According to Researchers of [6], the absence of access for persons with disabilities can strengthen the vulnerability of these groups. Moreover, the establishment of easy access for persons with disabilities to the employment, education, and infrastructure sectors has a good impact on welfare. In addition, improvisation in access to health can also help reduce the vulnerability of groups with disabilities [10].

3.3 Availability of Access for Persons with Disabilities to the Welfare of Their Groups in Other Areas

Models 5 and 6 show that accessibility for persons with disabilities also has a good impact on the welfare of their groups in the surrounding area. Before the spatial analysis is carried out, there are stages to test whether the variables used have an influence on other areas with the Moran test [5]. Using the Moran test, it is found that there is a strong influence of the area of origin variables on the surrounding area. In the analysis of areas that fall into the category of neighbors of origin, the existence of qualified health facilities and access to education for persons with disabilities can improve the welfare of persons with disabilities in other areas, but not for having high health insurance. Whereas in the analysis of other regions as a whole, only access to health insurance and health facilities can improve the welfare of disabilities in other regions even though the magnitude of the effect is very small. Based on these results, it can be concluded that the existence of access for persons with disabilities has a spillover effect that can improve the average welfare of persons with disabilities in other areas. According to Researchers of [10], there is indeed a relationship between groups with disabilities and the level of welfare in other areas close to the area of origin. In addition, the existence of access, especially for persons with disabilities in an area that is better described through infrastructure, the presence of health workers, and the status of the capital city, in its findings, can improve the welfare of the disabled group as well as reduce the poverty level gap between groups with disabilities and non-disabilities in other areas.

4 Conclusion

Thus far, the disability group is a vulnerable group that still has several problems, such as the small contribution of disability and even tends to be negative for the welfare of society as a whole or for the group. In 2012, disability has a negative impact on household welfare, besides that this group can also increase the chances of a family entering poverty [1]. In the analysis in 2019, it was found that groups with disabilities still have a negative impact on the welfare of the whole and the group. This shows that there has been no change in the role of the disabled in the economy (Models 1 and 3).

One of the reasons for not changing conditions with disabilities is the absence of adequate access for groups with disabilities in every area where they live. Access for disabilities is reflected in their access to health facilities, educational participation, and ownership of health insurance. Although there are some areas that have this access, the inequality of access for persons with disabilities has not been able to help reduce the negative impact of the existence of groups with disabilities nationally.

In the analysis that has been conducted, it can be proven that the existence of access for persons with disabilities is indeed very important because in the case of Indonesia, access from the health sector and education can improve the welfare of families with disabilities at the regional level. In addition, the existence of access that is above the average in other regions can also improve the welfare of groups with disabilities in neighboring areas and in other areas. To improve the welfare of groups with disabilities so as to reduce the overall negative impact, it is necessary to accelerate policies by the government aimed at providing access for persons with disabilities related to health facilities, health insurance, and educational participation. In detail, several things that the government needs to provide are: (1) improving disability-friendly health facilities especially in areas with lower health facilities and provide health workers with special skills for people with disabilities; (2) acceleration in providing health insurance for all of the people with disabilities; (3) enhancing special education facilities for people with disabilities, make additional quota for disabilities in public school, and improve the quality of teacher for Special Education subjects; (4) in the presence of spillover effect, the government may focus provides access for disabilities in the area with high rates of spillover effect such as metropolitan area, even though the access must be evenly distributed among districts/cities in Indonesia.

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