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Determinants of Disability in a Vulnerable Population - the Elderly of Indonesia.

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Determinants of Disability Status in a Vulnerable Population - the Elderly of Indonesia

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Abstract. The elderly constitute a vulnerable population, particularly in a disaster situation where they face much greater risks. The vulnerability of the elderly to disaster increases with disability as it undermines their ability to prepare, respond to and recover from disaster impacts. Hence, their protection needs to be prioritised during an emergency response to disasters as stipulated in Law 24 of 2007 of the Republic of Indonesia. In order to implement Disaster Risk Reduction programs more efficiently, it is vital to have a well-functioning database on the elderly with disabilities. Such databases are still lacking in Indonesia, and those that exist are not well organised or not widely usable due to differences in concepts between different agencies. This gap can be filled by using functional impairment data collected at National Socio-economic Surveys (SUSENAS). Utilizing the 2021 SUSENAS data, this study aims to: (i) estimate the prevalence and distribution of the elderly with disabilities, and (ii) identify the determinants of disability among the elderly by using binary logistic regression. The results show that the national prevalence of disability among the elderly is 39.47%. South Sulawesi, Gorontalo, and North Maluku are the three provinces with the highest prevalence of disability among the elderly. There are 13 provinces that have both high prevalence of disability among the elderly and high levels of disaster risk. Residence, region, age, gender, marital status, living arrangement and health complaints have a statistically significant influence on the likelihood of the elderly being disabled.

Keywords: Vulnerability, Elderly, Disability, Binary Logistic Regression

1 Introduction

Due to its geographical location, Indonesia is more prone to disasters and associated risks than any other country in the world. Many regions of Indonesia are highly susceptible to natural hazards such as earthquakes, volcanic eruptions, floods, droughts, landslides and tsunamis. In the event of a disaster, certain population groups become more vulnerable than other groups for a variety of reasons. For example, during an earthquake the elderly are more vulnerable than other age groups due to limitations in movement (mobility), as disability is more prevalent among the elderly than any other age-group of the population. he elderly with disability may become dependent on

assistive devices or other people. The vulnerability of the elderly to disaster increases with disability and undermines their ability to prepare, respond to and recover from disaster impacts. Law 24 of 2007 of the Republic of Indonesia states that the implementation of disaster management during an emergency response should prioritise the protection of vulnerable groups.

Indonesia is experiencing an aging population, and the population of the elderly is growing rapidly. According to BPS-Statistics Indonesia (herein after called as BPS), there are 29.3 million elderly (aged 60 years and above) in Indonesia as of 2021, which comprises 10.82 % of the total population. This number is estimated to increase to 48.2 million (15.77% of the total population) by 2035. The number of the elderly in Indonesia will continue to increase, because currently the large working age population will enter old age with time.

Disaster Risk Reduction (DRR) is an important strategy for minimizing the impacts of disasters. The United Nations Sendai Framework for DRR 2015-2030 underscores the importance of disaster risk management and outlines seven clear targets and four priorities for action to prevent new disaster risks and reduce existing ones. To implement DRR programs efficiently, it is vital to have a well-functioning database on the elderly with disabilities. Unfortunately, there are differences in the number of elderly with disability due to differences in disability concepts among government agencies of Indonesia. Data on persons with disabilities in Indonesia currently are collected by several agencies such as the BPS-Statistics Indonesia, the Ministry of Social Affairs, the Ministry of Education, and the Ministry of Health. Consequently, there is a lack of a uniform database in Indonesia, or databases that do exist are not well organized or not widely usable as they pertain only to localised situations. This gap can be filled by Functional Impairment data collected by BPS at National Socioeconomic Surveys (SUSENAS). BPS collects data on persons with disabilities since 1980 through census activities and surveys including the Population Census, Inter-Census Population Survey (SUPAS), and the SUSENAS. There are eight types of functional disorders that are collected at the SUSENAS, namely difficulties in (i) seeing, (ii) listening, (iii) walking/climbing steps, (iv) using hands/fingers, (v) concentration/memory, (vi) behavioural/emotional disorders, (vii) communicating and (viii) taking care of oneself.

Several studies have investigated the factors affecting disability among the elderly such as those in in India [1], China [2], Colombia [3], and Indonesia [4], [5], [6]. Most of these studies have used logistic regression to model a relationship between several categorical independent variables and the status of disability of the elderly. The simple interpretability of the functional relationship between independents and dependent variable using odds ratios (OR) makes this method a powerful tool [7]. Various demographic and socioeconomic variables, including age, gender, place of residence, education, occupation, marital status, etc., are investigated as determinants of the status of disability among the elderly. Whereas a study by Pengpid et.al.[8] utilised Poisson regression to investigate the socio-demographic factors of frailty in community-dwellings of older adults in Indonesia. While Channer et.al. [9] used a series of Analysis of Variance (ANOVA) tests to examine whether the vulnerability of the elderly by income, foreign language, and immigrant status is different in rural,

suburban, and urban across all of Canada. On the other hand, several other studies related to the elderly, disabilities, and disasters used different approach like systematic review [10], [11] and qualitative study [12], [13].

Up until now, no study has been done to investigate the determinants of the disability status of the elderly in Indonesia based on the latest data, as [5] used the 2013 SUSENAS data for national coverage analysis and [6] used the 2018 SUSENAS data but they covered the elderly only in rural areas. Whereas recent data and information on the characteristics of elderly people with disabilities are crucially needed to measure the needs of these vulnerable groups in the pre- and post-disaster phases. Therefore, by utilizing the March 2021 SUSENAS, the objectives of the present study are (i) to estimate the prevalence and distribution of the elderly with disabilities in Indonesia then link it with the 2021 Disaster Risk Index (IRBI) scores using a Cartesian diagram, and (ii) to identify the determinants of disability status among the elderly of Indonesia by using binary logistic regression. As adopted in SUSENAS, this study uses the concept of disability that the elderly with disabilities are those who experience physical, intellectual, mental, and/or sensory limitations for a long time, and experience obstacles and difficulties in interacting with the environment and participate fully and effectively with other persons. It is expected that the results of the study can support various programs of DRR for the elderly in Indonesia.

2 Methods

2.1 Data Source

This is a cross-sectional study and uses the March 2021 SUSENAS data to fulfil the objectives. The SUSENAS is a series of large-scale multipurpose socioeconomic surveys conducted by BPS twice a year, once in March and one in September. The March SUSENAS is used for district-level estimation that covers a nationally representative sample typically composed of about 340,000 households, whereas the September SUSENAS is designed for provincial-level estimation with a sample of 75,000 households. The unit of analysis of the present study is the elderly (population aged 60 years and over) with disabilities. This is in accordance with the definition of elderly with disabilities contained in Law No. 13 of 1998 concerning the welfare of the elderly. The sample size used in the present study is 122,694 elderly.

2.2 Variables of Study

The dependent variable in this study is the Disability Status of the elderly. This variable is constructed from Block X of the March 2021 SUSENAS questionnaire on Description of Functional Disorders. We use low-threshold disability as described by [14] which covers a person who experiences some difficulty or a lot of difficulties or is even unable to do any activity. It may be noted that the definition of functional difficulty used at the March 2021 SUSENAS has four categories: (i) “no difficulty”, (ii) “some difficulty”, (iii) “a lot of difficulties”, and (iv) “cannot do at all”. The selection of independent variables in this study is derived from previous studies with regard to

factors affecting disability status among the elderly such as [1],[2],[3],[4], and [6]. All these variables are presented in Table 1.

Table 1. Variables Used in Binary Logistic Regression Model.

Variable	Operational Definition	Categorization
Dependent Variable		
Disability status	A person aged 60 years and over who is disabled	0 – No (not disabled) 1 – Disabled elderly
Independent Variables (those marked with an asterisk are reference categories)		
Residence	Classification of residential area	0 – Rural* 1 – Urban
Region	Region	0 – Outside Java-Bali* 1 – Java-Bali
Age group (in years)	Age group	0 – 60-69* 1 – 70-79 2 – ≥80
Gender	Gender	0 – Female* 1 – Male
Marital Status	Current marital status	0 – Unmarried/divorced* 1 – Married
Head of household	Someone who is responsible for the daily needs of the household	0 – No* 1 – Yes
Living arrangement	Whether or not the person lives with another person	0 – Living alone* 1 – Co-residing with others
Health complaints	Health complaints in the last month.	0 – No* 1 – Yes
Health insurance ownership	Whether or not the person has health insurance	0 – No* 1 – Yes

Source: Drawn by the authors.

2.3 Method of Analysis

The methods of analysis used in this study comprise descriptive and inferential methods. We estimated the prevalence of the elderly with disabilities for each province in Indonesia by incorporating the individual sampling weight of the March 2021 SUSENAS. Thereafter, we linked the estimates of the prevalence of the disabled elderly with the 2021 Disaster Risk Index (IRBI), officially released by the National Agency for Disaster Management (BNPB), using a Cartesian diagram. Next, on the basis of the Pearson's Chi-square statistic, we determined whether the independent variables are associated with the disability status of the elderly. Then we employed Logistic Regression to address the second objective of the study. Logistics Regression is a special type of regression that is used when the dependent variable is categorical (nominal or ordinal scale) to examine the effect of the independent variables on the dependent variable. Given that the categories of dependent variables in this study are

dichotomous (0 = not disabled and 1 = disabled elderly), this study uses the Binary Logistics Regression method. Binary logistic regression estimates the probability that the desired dependent variable characteristics exist (e.g. the probability of occurrence of "disable elderly") based on the values of the independent variables [17]. The possible values of the dependent variable, Y=1 for probability of "disabled elderly" and Y=0 for probability of "non-disabled". Meanwhile, the value of π(x) is the probability of the occurrence of P(Y=1). So, the logistic regression equation is:

$$\frac{\pi(x)}{1-\pi(x)} = e^{\beta_0+\beta_1 x_1+\beta_2 x_2+\cdots+\beta_p x_p} \quad (1)$$

or under logit transformation is:

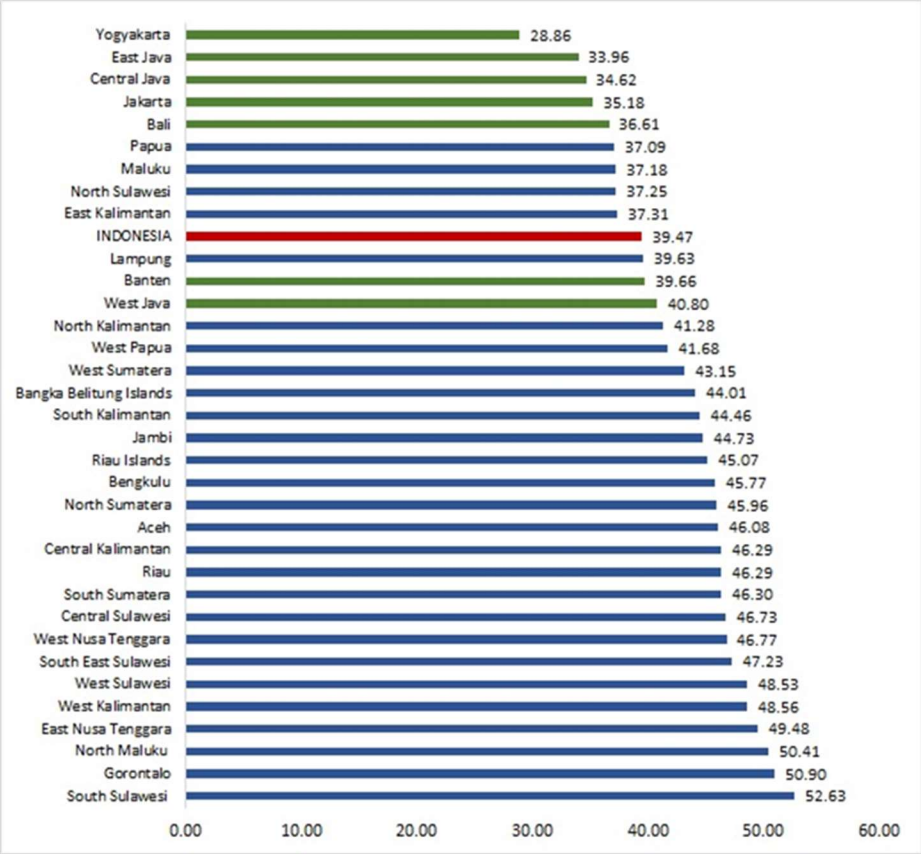
$$ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p \quad (2)$$

where $x_j, j = 1,2,\ldots,p$ is independent variables that determine the disabilities of elderly with the magnitude impact represented by β_0, β_1, ..., and β_p. Further, these parameters are estimated and the interpretation of functional relationship between independent and dependent variable in term of Odds Ratio (OR), e^{β_j}, is performed. The OR represents the comparison of occurrence or odds for a specific outcome given specific category and occurrence or odds for specific outcome given the absence of specific category [15], [18].

3 Results and Discussion

3.1. Estimation of Disability Prevalence among Elderly

Figure 1 presents the estimation of the prevalence of the elderly with disabilities for each province. As can be seen from Figure 1, the prevalence of disability among the elderly at the provincial-level ranges from 28.68% to 52.63% and the estimated prevalence is 39.47% at the national level. South Sulawesi, Gorontalo, and North Maluku are the three provinces with the highest prevalence of disability among the elderly. More than half of the elderly population in these three provinces are disabled. Furthermore, most of provinces in Indonesia (25 out of 37 provinces) have the prevalence of elderly with disabilities above the national rate, The overwhelming majority of such provinces are outside the Java-Bali Region. Only two provinces in the Java-Bali region, namely Banten and West Java have a prevalence of disability among the elderly that is more than the national rate. Eight provinces, namely Yogyakarta, East Java, Central Java, Jakarta, Bali, Papua, Maluku, North Sulawesi and East Kalimantan. Just as above national average prevalence of disability among the elderly is dominated by provinces outside Java-Bali, below national average disability among the elderly is dominated by provinces in the Java-Bali region. These provinces are Yogyakarta, East Java, Central Java, Jakarta, and Bali (see Figure 1).



Source: The March 2021 SUSENAS, processed by authors.

Fig. 1. Prevalence of Disability among the Elderly in Indonesia by Province, 2021.

To find out which provinces have a high prevalence of elderly people with disabilities that are also provinces with a high level of disaster risk, the prevalence data for elderly people with disabilities is linked to the 2021 IRBI scores. IRBI is the Indonesian Disaster Risk Index issued annually by the National Agency for Disaster Management (BNPB) as a form of monitoring and monitoring in the regions [20]. IRBI is calculated based on the formula:

$$Risk = Hazard \times \frac{Vulnerability}{Capacity}$$

where Hazard is assessed based on the probability of spatial, frequency and magnitude of a natural disaster phenomenon, Vulnerability is assessed based on socio-cultural, economic, physical and environmental parameters, and Capacity is assessed based on

the level of regional resilience. Hence, the IRBI scores can be used for comparing the level of disaster risk among provinces of Indonesia. A Cartesian diagram is constructed to find out the association between the prevalence of elderly people with disabilities and the 2021 IRBI scores (see Figure 2).

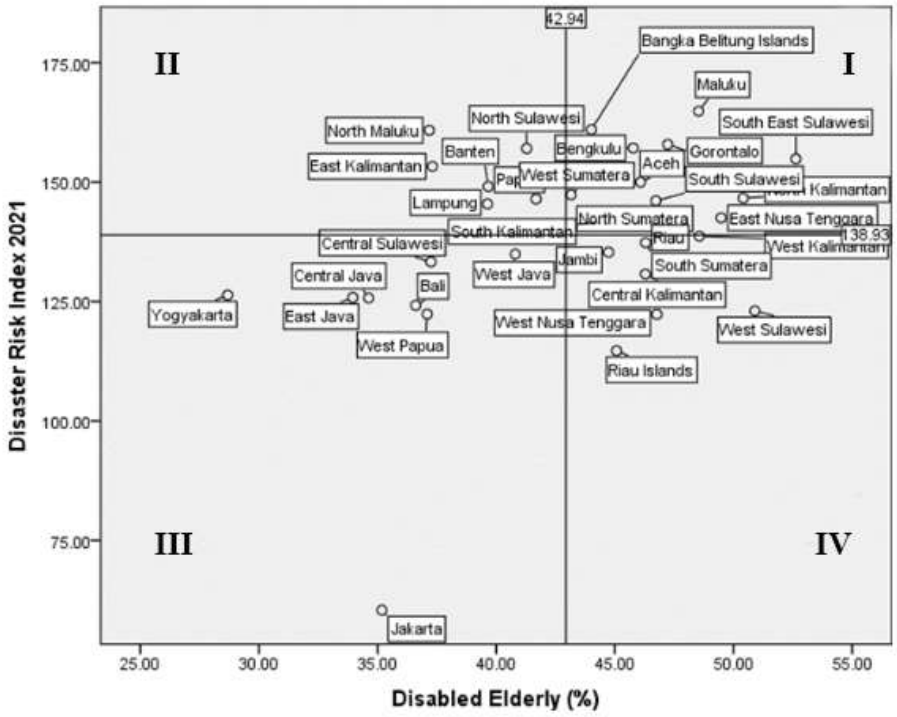


Fig. 2. Cartesian Diagram
Source: Created by the authors.

Based on Figure 2, the prevalence of elderly people with disabilities can be classified into four quadrants. Quadrant I denotes the group of provinces that have a high prevalence of elderly people with disabilities as well as high levels of disaster risk. This quadrant consists of 13 provinces namely Maluku, Southeast Sulawesi, Bangka Belitung Islands, Aceh, Riau, West Sumatera, Bengkulu, North Kalimantan, South Sulawesi, East Nusa Tenggara, South Kalimantan, North Sumatera and Gorontalo. Consequently, in order to minimise casualties and other losses when natural disasters occur, both central and regional governments can prioritise various protection programs for the elderly with disabilities in these provinces. Quadrant II shows provinces with high disaster risk but low prevalence of disability among the elderly and consists of six provinces, namely North Maluku, North Sulawesi, Banten, Papua East Kalimantan and Lampung. Quadrant III denotes low disaster risk and low prevalence of disability among the elderly, which consists of eight provinces, namely Central Sulawesi, Central Java, Yogyakarta, East Java, Bali, West Java, West Papua and Jakarta. Lastly, Quadrant

IV, denoting low disaster risk but high prevalence of disability among the elderly consists of seven provinces, namely West Kalimantan, Jambi, South Sumatra, Central Kalimantan, West Nusa Tenggara, West Sulawesi and Riau Islands.

Table 2 shows the characteristics of the elderly with disabilities in Indonesia in 2021. From this table we can see that more than half of the elderly live in rural areas (59.1%) and 44.8% of them are known to be disabled. We also know that there are 60.2% elderly living outside the Java-Bali region and almost half of them have disabilities. More than half of the elderly in Indonesia are heads of their families (59.3%) and 41% of them are elderly with disabilities. It is sad to know that elderly people with disabilities still have to bear the daily living expenses of their households.

Table 2. Frequency, Percentage and Pearson's Chi-square Distribution of Variables with Disability Status of Elderly in Indonesia

Variable	Label	Frequency	Percent	Elderly with Disabilities		Pearson Chi-Square
				No	Yes	
Residence	Rural	72,558	59.1	55.2	44.8	736.923*
	Urban	50,136	40.9	63.0	37.0	
Region	Outside Java & Bali	73,887	60.2	54.0	46.0	1476.332*
	Java & Bali	48,807	39.8	65.0	35.0	
Age Group	60-69 years old	80,364	65.5	67.0	33.0	8243.715*
	70-79 years old	31,739	25.9	46.6	53.4	
	≥80 years old	10,591	8.6	28.2	71.8	
Gender	Female	64,099	52.2	55.1	44.9	606.130*
	Male	58,595	47.8	62.0	38.0	
Marital Status	Unmarried/divorced	46,566	38.0	49.4	50.6	2490.830*
	Married	76,128	62.0	63.9	36.1	
Head of household	No	49,895	40.7	57.5	42.5	25.258*
	Yes	72,799	59.3	59.0	41.0	
Living arrangement	Living alone	12,157	9.9	43.2	56.8	1281.780*
	Co-residing with others	110,537	90.1	60.1	39.9	
Health complaints	No	73,594	60.0	65.4	34.6	3709.483*
	Yes	49,100	40.0	47.9	52.1	
Health insurance ownership	No	30,699	25.0	57.4	42.6	16.594*
	Yes	91,995	75.0	58.7	41.3	

Source: March 2021 SUSENAS, processed.

Note: * denotes statistically significant at p-value<0.05.

Table 2 also shows that the majority of the elderly live with other household members (90.1%) and only about 40% are disabled. Within a month ago, generally the elderly stated that they had no health complaints. Of the 40% of the elderly who reported that they experienced health complaints in the past month, 52.1% of them were people with disabilities. Three quarters of the elderly claim to have health insurance and 41.3% of the elderly who have this health insurance are people with disabilities (41.3%). Besides we can make category of the age of elderly into Young old (60-69), Middle age old (70-79) and Old-old (80 years and over). From Table 2, we know that majority of the elderly is in the group of Young old (65.5%) and 33% of them are disabled. Also, we know that more than half of elderly in Indonesia are female (52.2%) and almost two thirds of these elderly are married (62%). Among these married elderly, 36.1% are disabled.

3.1. Binary Logistic Regression Analysis

Before applying the binary logistic regression method to the data, we performed the Chi-Square test of independence to determine whether there is an association between independent variables and dependent variable (disability status of the elderly). The results of the Chi-Square test of independence can be seen in the last column of Table 2. It can be concluded from Table 2 that Residence, Region, Age group, Gender, Marital Status, Head of Household, Living arrangement, Health complaints and Health insurance ownership were associated significantly at 5% level of significance (p-value<0.05) with disability status of elderly.

Table 3 shows the estimation results of binary logistic regression model. As shown in this table, the variables that are statistically significant in the probability of elderly experiencing disability are Residence, Region, Age group, Gender, Marital status, Living arrangement, and Health complaints at the 5% level. This is not the case with variable Head of household and Health insurance ownership that it is found not significant in the probability of elderly experiencing disability at the 5% level. Interestingly, the findings of our study are in line with the results from the previous studies as our main reference, e.g. [1],[2],[4], [5], and [6], especially for variables of residence, age group, gender, and marital status.

After the regression model was formed, the model fit test was carried out using the Hosmer-Lemeshow test and resulted in a p-value of 0.000. This means that H_0 is rejected or the model does not match the data. However, [19] stated that most of the results of the Hosmer-Lemeshow test resulted in a high rejection rate of H_0 when a large sample was used. In the present study the number of samples was large (122,694 elderly). Therefore, the model fit test with the classification table is used as an alternative and it is known that the predictive ability of the binary logistic regression model formed is 65.8% and this is considered good enough.

Furthermore, the Odd Ratio values of the significant variables on the disability status of the elderly are explained which can be seen from the values in the last column of Table 3. The results of our study found that the elderly in rural areas (1/0.0866=1.23) were 1.23 times more likely to experience disability than the elderly in urban areas. The elderly living outside Java-Bali has a 1.62 times higher likelihood than the elderly in

Java-Bali to experience disability. It is plausible for current condition in Indonesia that the elderly in rural areas and outside Java-Bali have a greater tendency to become disabled because access to health facilities is indeed much more available in urban areas and Java-Bali.

Table 3. Estimation Result of Binary Logistic Regression Model.

Variable		Estimate	Wald	Odds Ratio
Intercept		-0.144*	25.866	0.866
Residence	Rural			
	Urban	-0.205*	248.631	0.815
Region	Outside Java-Bali			
	Java-Bali	-0.486*	1374.690	0.615
Age Group	60-69			
	70-79	0.786*	3067.462	2.194
	≥80	1.574*	4224.602	4.825
Gender	Female			
	Male	-0.118*	44.945	0.889
Marital Status	Unmarried/divorced			
	Married	-0.192*	153.319	0.825
Head of household	No			
	Yes	-0.019	1.209	0.981
Living arrangement	Living alone			
	Co-residing with others	-0.387*	256.336	0.679
Health complaints	No			
	Yes	0.678*	2941.560	1.970
Health insurance ownership	No			
	Yes	-0.026	3.282	0.974

Source: March 2021 SUSENAS, processed.
Note: * denotes statistically significant at p-value<0.05.

The Middle age old and Old-old were likely to be disabled elderly compared to the Young old. Then female elderly were 1.12 times more likely to experience disability than the male elderly. Also unmarried/divorced elderly was likely to experienced disability than married elderly. Most likely this is because having a partner who takes care of each other in old age is important to prevent the elderly from being disabled. It can also be seen from the likelihood of the elderly who living alone tend to become disabled elderly by 1.47 times higher than the elderly who co-residing with others. Furthermore, the elderly who reported experiencing health complaints in the past month

likely to experience disability 1.97 times higher than the elderly who did not have health complaints. This finding is in line with the result of [4].

4 Conclusion

This study tries to provide data on the estimated prevalence of elderly people with disabilities in Indonesia and their determinants based on the latest data. The results of the study show the provinces of South Sulawesi, Gorontalo and North Maluku have the highest prevalence of disabled elderly in the country. in. The risk for the elderly to become disabled is higher for the elderly who live in rural areas, outside Java-Bali, in the Middle age old and Old-old age group, female, not married/divorced, living alone and have health complaints.

Therefore, it is recommended that more attention is needed to focus the elderly. Prevention programs for the elderly to become disabled also need to be started early in the provinces where the prevalence of elderly people with disabilities is quite high and high risk of disaster sis high well. Assistance programs for the elderly, both from relevant government agencies and community groups that care for the elderly, need to be carried out immediately, especially for the elderly who live alone and have a history of health complaints. By preventing the elderly from becoming disabled, the risk of loss and the number of victims during a disaster can be minimised. Moreover, further research can be done by estimating the prevalence of disabled elderly at the district level so that more efficient programs can be designed and can be prioritised in more targeted districts.

References

1. Pou, L.and Goli, S.: Burden of Multiple Disabilities among the Older Population in India: An Assessment of Socioeconomic Differentials. International Journal of Sociology and Social Policy. 33(1), 63-76 (2013).
2. Chen, S., Qin, J., Li, Y., Wei, Y., Long, B., Cai, J., Tang, J., Xu, X., Yu, G., Zhang, Z.: Disability and Its Influencing Factors among the elderly in a County, Guangxi Province, China.: International Journal of Environmental Research and Public Health. 15(0), (2018).
3. Gómez, F., Osorio-García, D., Panesso, L. and Curcio, C.L. Healthy aging determinants and disability among older adults: SABE Colombia.: PAN American Journal of Public Health. 45:e98. https://doi.org/10.26633/RPSP.2021.98, (2021).
4. Ng, N., Hakimi, M., Byass, P., Wilopo, S. and Wall, S.: Health and Quality of Life among Older Rural People in Purwerejo District, Indonesia. Global Health Action Supplement 2, (2010). DOI: 10.3402/gha.v3i0.2125
5. Prasetyoputra, P. and Prasojo, A.P. Disability among the Elderly in Indonesia: An Analysis of Spatial and Socio-demographic Correlates. MDPI AG in 1st International Electronic Conference on Geriatric Care Models Session Long Term Care. (2019). DOI: 10.3390/IECGCM-1-06167.
6. Puspitasari, M.D., Rahardja, M.B., Gayatri, M. and Kurniawan, A.: The Vulnerability of Rural Elderly Indonesian People to Disability: An Analysis of the National Socioeconomic Survey. Rural and Remote Health 2021; 21: 6695. https://doi.org/10.22605/RRH6695.

7. Hosmer, D. and Lemeshow, S.: Applied Logistic Regression. 2nd edn. John Wiley & Sons, Inc., New York (2000).
8. Pengpid, S. and Peltzer, K.: Prevalence and Associated Factors of Frailty in Community-Dwelling Older Adults in Indonesia, 2014-2015. International Journal of Environmental Research and Public Health. 17, 10; DOI:10.3390/ijerph17010010. (2020).
9. Channer, N.S., Hartt, M. and Biglieri, S.: Aging-in-Place and the Spatial Distribution of Older Vulnerability in Canada. Applied Geography. 125, 102357, https://doi.org/10.1016/j.apgeog.2020.102357. (2020).
10. Maltais, D.: Elderly People with Disabilities and Natural Disasters: Vulnerability of Seniors and Post Trauma. Journal of Gerontology & Geriatric Medicine, 5(041), DOI:10.24966/GGM-8662/100041.
11. Timalsina, R. and Songwathana, P.: Factors Enhancing Resilience among Older Adults Experiencing Disaster: A Systematic Review. Australian Emergency Care, 23, 11-22. (2020).
12. Kwan, C.: Factors and Processes in the Pre-Disaster Context that Shape the Resilience of Older Women in Poverty. International Journal of Disaster Risk Reduction, 48(101610). https://doi.org/10.1016/j.ijdrr.2020.101610. (2020)
13. Yodsuban, P. and Nuntaboot, K.: Community based Flood Disaster Management for Older Adults in Southern of Thailand: A Qualitative Study. International Journal of Nursing Sciences. DOI: https://doi.org/10.1016/j.ijnss.2021.08.008. (2021)
14. Adioetomo, S.M, Mont, D. and Irwanto.: Persons with Disabilities in Indonesia: Empirical Facts and Implications for Social Protection Policies, Jakarta, Indonesia, Demographic Institute, Faculty of Economics, University of Indonesia in collaboration with Tim Nasional Percepatan Penanggulangan Kemiskinan (TNP2K). Jakarta, Indonesia. (2014).
15. Hosmer, D. and Lemeshow, S.: Applied Logistic Regression. 2nd edn. John Wiley & Sons, Inc., New York (2000).
16. Agresti, A.: An Introduction to Categorical Data Analysis. 2nd edn.: John Wiley & Sons. New Jersey (2007).
17. Azen, R. and Walker, C.M. (2011).: Categorical Data Analysis for the Behavioral and Social Sciences. Taylor and Francis Group, LLC. New York (2011).
18. Szumilas, M. (2010). Explaining odds ratios. Journal of the Canadian Academy of Child and Adolescent Psychiatry, 19, 227–229. https://doi.org/10.1136/bmj.c4414
19. Bartley, A. C. (2014). Evaluating goodness-of-fit for a logistic regression model using the Hosmer-Lemeshow test on samples from a large data set [Master's thesis, Ohio State University]. OhioLINK Electronic Theses and Dissertations Center. http://rave.ohiolink.edu/etdc/view?acc_num=osu1396951135
20. BNPB. Indeks Risiko Bencana Indonesia (IRBI) 2021 [Indonesian Disaster Risk Index, 2021]. Data, Information and Communication Center of Disaster-BNPB. Jakarta (2022).