

# Estimating the extra cost of living for people with disability: some budgetary implications for Danang City

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## ABSTRACT

The extra cost of living for disabled people is still a main concern among researchers and policy makers over the world. This study aims at estimating the extra cost of living for disabled people and quantifying the effect of government financial supports for disability in Danang City, Vietnam. The measures of such important variables as standard of living and disability status will be modified in our study. Direct interviews were conducted with any members of a household with and without disability. The OLS and ordered logit regression are employed to build up the model estimating the extra cost of living for disabled people. The results indicate that extra cost of living of household with disabled people is higher than that of household without disabled people; the subsidy from government increases the standard of living for households with disability. It is expected to help the policy makers in Danang city to prepare a budget for disability in the future.

Key words: extra cost of living, disability, Danang city

## I. Introduction

Improving the standard of living for disabled people is one of human being policies to reach equality in the modern society. The cost of living for people with disability is usually higher than for an average member of the community, as a result of the additional requirements in terms of goods and services which people with disability need but people without disability may not need and items everyone needs but people with disability need more of (Tibble, 2005). Berthoud et al. (1993), Zaidi and Burchardt (2005) and Saunders (2006) reported that the extra cost of disability is substantial. Therefore, addressing the extra living costs of disability is considered as a logical step towards alleviating elements of social exclusion for disabled people (Cullinan et al, 2011).

Some studies have been done to estimate the additional costs of people with disability in developed countries as well as developing countries (see Zaidi and Burchardt (2005), Cullinan et al. (2011), Mont and Cuong (2011), Minh et al (2015)). These studies measure the extra cost of living based on standard of living but the proxies of standard of living are adopted differently. Additionally, the support from governments to cover the cost of living for people with disability as well as the effect of government financial support on the

standard of living in terms of level of disability have not been considered on the previous studies.

The results from previous studies shown that extra cost of living of people with disability are different in country by country. The question that arises naturally is how much the extra cost of living of people with disability in developing countries like Vietnam. Danang city is known as one of the most livable cities in Vietnam, representing a good case study due to a fairly large population with disability that is deprived relative to the wider population. However no study related to extra cost of living of people with disability has been conducted to help local government in preparing their budget for supporting people with disability.

Accordingly, this study will attempt to fill important gaps in the literature by investigating the extra cost of standard of living, the effect of government support on standard of living of people with disability and budget implication for local government to support people with disability, especially in the context of a leading city in a developing country.

The aims of our research are to:

- offer a first estimate of the additional costs of disability for households in Danang city;
- investigate the effect of government support on the standard of living of people with disability; and
- estimate the gap between the extra cost of living and the support actually received from government for people with disabilities and the potential impact on the local municipality budget of a hypothetical attempt to erase such a gap.

The rest of the paper is organized in four sections. Section 2 reviews the literature on estimating the cost of disability and relevant previous researches, from that finding out some gaps in the literature review. The next section presents the methodology to estimate the extra cost of disability and additional budget to reduce a gap between disabled and non-disabled people, and discusses the variables used in the model. Section 4 presents results and cost of disability and budget estimates. Section 5 sets out conclusions and gives some implications.

## **II. Literature review**

An appropriate definition of disability using in empirical approach has been problematic, and many researchers have been using the various methods of describing disability. The traditional medical form of disability was viewed as synonymous with having a medical condition or functional limitation (Mont and Cuong, 2011), but in recent years a social model is widely accepted where disability is viewed as an outcome of social attitudes and structures, and the interaction between the person and environmental factors, where the discriminatory barriers in society are stressed and there is an increased endeavour for greater integration of disabled people into society (Cullinan et al, 2011). Therefore, according to World Health Organization's Report (2016), "Disabilities is an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations".

Standard of living of disabled people has been a big concern in recent years. People with disabilities, compared to those without disabilities, are more likely to have poor living conditions, lack of nutritious food, fewer chance of accessing health care and education and work in unsafe working environments (Braithwaite and Mont, 2009; Mont and Cuong, 2011; Minh et al., 2015). A number of studies in different countries have identified major determinants that affect the standard of living of disabled people. Zaidi and Burchardt (2005) found out that standard of living for disabled people in the UK depends on income and the severity of disability. Cullinan et al. (2011) found the cost of disability to Ireland to vary by severity of disability and across household type. It is likely that the government support affects the standard of living for disabled people but most previous studies have tended not to investigate this relationship in any depth (Table 1). Therefore, this research will check whether the government support affects the standard of living for disabled people.

**Table 1:** Summary of findings in previous studies

	<b>UK (2003)</b>	<b>Ireland (2011)</b>	<b>Bosnia (2009)</b>	<b>VN (2009)</b>	<b>VN (2011)</b>
<b>Extra cost of living</b>	14%-50% and rise with severity of disability	8.5%-44.4% Vary by severity of disability and household types	14%	9%	8.8%-9.5%
<b>Income</b>	+(Sig)	+(Sig)	+(Sig)	+(Sig)	+(Sig)
<b>Status of disability</b>	- (sig) by severity of disability	- (sig) by severity of disability	- (sig)	- (sig)	Seeing - (sig)
					Hearing - (sig)
					Walking - (sig)
					Remembering - (sig)
					Self-care -
Communication - (sig)					
<b>Government support</b>	n.a	n.a	n.a	n.a	n.a

Mont and Cuong (2011) stated that disability is significantly correlated with poverty and lack of employment in Vietnam. Minh et al. (2015) checked the relationship between standard of living and severity of disability and income in Vietnam. In recent years, disabled people in Vietnam have received the government support including monthly subsidy and annual health insurance. Therefore, this research will pay special attention to such government support and its effect on the standard of living for disabled people in Vietnam.

Extra cost of living for people with disability is also a big consideration in previous studies. It is defined as an additional amount of money people with disability would need to spend to achieve the same standard of living as people without disability (Zaidi and Burchardt, 2005). Up to now, there have been numerous researches in estimating the extra cost of living for people with disability such as Zaidi and Burchardt (2005), Braithwaite and Mont (2009), Cullinan, Gannonb, and Lyons (2011), Mont and Cuong (2011) and Minh et al. (2015) with proxis used difference as shown in Table 2. Additionally, Table 1 shown that the extra cost of disability in developed countries like UK or Ireland is substantial and higher than those in developing countries. The previous studies in Vietnam were conducted in two major

metropolitan in Vietnam including Hanoi and Ho Chi Minh cities and other provinces. No study has been done in Danang City which is known as one of the most livable city in Vietnam. It raises a question whether there are any differences in the extra cost of living of disabled people in Danang City compared to other cities in Vietnam.

**Table 2** - Measures of important variables in previous studies

No	Authors	Standard of living		Disability status		Income
		Approach	Technique	Approach	Technique	
1	Zaidi and Burchardt (2005)	Index of assets (13 items) Savings index Assessment of the household's financial situation	Sum score  4 categories (Living Comfortably; Doing alright; Just about getting by; Finding it difficult)	Physical approach Mental approach Social approach	Scales and dichotomy (yes/no)	Total income in a household
2	Cullinan J., Gannon B. and Lyons S. (2011)	Composite indicator		Physical approach Social interaction (WHO, 1999)	Yes, severely Yes, some extent No	Total income in a household
3	Minh et. al (2015)	Indicator 1 Indicator 2 (20 items of asset)	Sum index Factor analysis	Physical approach (WHO, 2011)	No-no difficulty Yes, some difficulty Yes, a lot of difficulty Cannot do at all	Total income in a household
4	Mont, D., and Cuong, N.(2011)	Index of assets (12 items)	Sum index	Physical approach	As above	
5	Braithwaite J. and Mont D. (2009)	Index of assets (7 items for each country)	Sum index	Physical approach	As above	

Disability is often concerned in line with different aspects such as poverty, education, government policy in the modern society. The previous studies pointed out some implications after estimating the extra cost of living. Some implications are suggested such as estimating poverty rates in the population (Zaidi and Burchardt, 2005; Cullinan et al., 2011), designing interventions to weaken that link between disability and poverty (Mont and Cuong, 2011) or developing policies and programmes of social protection (Minh et al., 2015) but the implications are not clearly quantified the budgetary for local and national government to support the disabled people. Based on the estimation of the extra cost of living of disabled people, this research will try to fill this gap by considering some budgetary implications for local government to support people with disability. This research will also consider the effectiveness of the current policies to help disabled people and find out whether such policies do go far enough in addressing the extra costs faced by the disabled community in Danang City.

### III. Methodology

#### *Fomulas*

Quantitative research is applied to estimate the extra cost of living of disabled people. We use the standard of living approach of Zaidi and Burchardt (2005) to quantify how income is related to a component of standard of living, and how disability reduces standard of living at a household level. This approach is based on the assumption that people with disability may spend a lower standard of living than their non-disabled counterparts with the same level of income because of diverting a portion of their income to cover disability-related costs (Zaidi and Burchardt, 2005). The approach also allows us to also determine the effect of other variables on standard of living including characteristics relating to the head of the household: age, gender, marital status; and household-level characteristics: tenure status, region, and number of children. Algebraically, the standard of living approach is derived from the following specification:

$$(1) \quad S = a \ln(Y) + bD + g X + k$$

Where:

S is an indicator of the standard of living

Y is an annual total household income

D is a dummy variable relating to disability status

X is characteristics related to head of household and household

a, b, and g are the coefficients, and k is a constant.

**Figure 1:** Standard of Living, Income and Disability

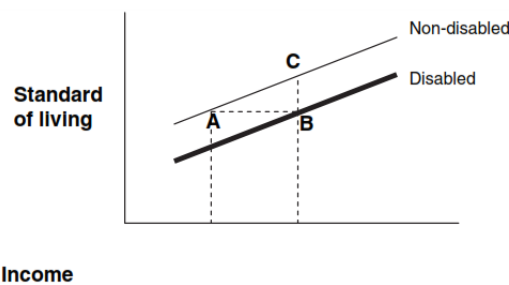


Figure 1 highlights the theoretical relationship between income, standard of living and disability used in this approach. According to Zaidi and Burchardt (2005), “b gives the distance BC between the two lines in Figure 1, while a gives their slope, or BC over AB. Thus  $b/a = BC/(BC/AB) = AB$ , which is the extra cost of disability”. Therefore, the extra cost of disability is approximated by  $-b/a$ .

After that, we add one more variable of support from government to disabled people in the equation (1) to investigate the effect of government support on the standard of living of people with disability. Of course, the income variable in the new equation would exclude the annual subsidy from government.

In regard to estimate the addition budget, a simple formula is set up to estimate the necessary budget to reduce a gap between disabled and non-disabled people as follows:

$$\text{Additional budget} = \sum_{i=1}^n N_i(E_i - S_i)$$

Where:

$N_i$ : number of disabled people in group  $i$

$E_i$ : extra cost of living for disabled people in group  $i$

$S_i$ : Current government subsidy for disabled people in group  $i$

### ***Definition of variables***

Measurement of standard of living: Based on economic theory and experiences from previous studies, the dependent standard of living variable is constructed in the dimension which is a range of 20 asset items possessed by households in Danang. This study has modified the items of assets that are suitable with Vietnamese living condition (see Box 1). The asset index includes two indicators. The first indicator is the average sum asset index given that each asset item has the same weight. This indicator has been modified as compared with previous studies in which the total sum index was calculated. The second indicator is constructed from running the Principal component analysis and then quantiled into 4 groups in the standardised indices of relative household wealth of the first principal component. The level 1 reflects the lowest standard of living, while the level 4 show the highest one.

*Box 1 – Standard of living questions*

Do you have the following properties?

<b>Property</b>	<b>Yes/No</b>	<b>Property</b>	<b>Yes/No</b>
1.Tap water		11.Gas stove	
2.Television		12. Electric stove	
3.Satellite/Capable TV		13. Electric kettle	
4.Radio		14. Microwave	
5.Video		15.Fridge	
6.Telephone		16.Electric heater	
7.Mobile phone		17.Washing machine	
8.Home computer		18.Air conditioner	
9.Internet		19.Motorbike	
10.Camera		20.Car	

Measurement of disability: Cullinan et al (2011) and Mont and Cuong (2011) confirm that disability is the result of an environment preventing disabled people from participating fully in the economic and social life, rather than synonymous with having a medical condition or functional limitation. This paper just simply looks at the ability of disable people to perform actions, rather than the presence of medical condition (Gertler and Gruber, 2002). Therefore, following the definition of disability status mentioned above, social approach which focuses on the difficulty in daily activities and the extent to which it limits or restricts a person in their day-to-day lives as shown on Box 2 are used in this study.

*Box 2 – Disability questions*

Do you have any chronic physical or mental health problem, illness or disability?

Yes  No

Are you hampered in your daily activities by this physical or mental health problem, illness or disability?

Cannot do at all

Yes, severely

Yes, some extent

No

Measurement of government support: Government support has not been considered in previous studies. At present, the Vietnam Government has policies supporting people with high or very high severity of disability by providing monthly subsidy of 405,000 VND or 540,000 VND, respectively. In addition, the people with disability are granted a health insurance card and other supports from the local and national agencies (see Box 3).

<i>Box 3 – Support from government questions</i>	
Do you receive any monthly subsidy from Government in Danang City?	
<input type="checkbox"/> Yes,..... VND/ month	<input type="checkbox"/> No
Are you granted an annual health insurance card?	
<input type="checkbox"/> Yes	<input type="checkbox"/> No

Other independent variables: The features of household’s head and household consist of geographic location (rural or urban), household size, tenure status, number of children, household’s head age, sex and marital status. For example, as in previous studies, tenure status is one of independent variables based on the assumption that household with the same income but different home ownership would have different standards of living (Zaidi and Burchardt, 2005). In addition, geographic location variable reflects differences in costs of living in different regions and the number of children in households may also effect the standard of living. In this paper, the household size has been equalized with the value of parameter 0.56 rather than actual household size (Equalized household size = Actual household size power 0.56) as suggested by Blinder (1970).

The OLS and ordered logit regression are chosen. Data were analyzed using SPSS statistical software. The analysis process is conducted in two stages. In the first stage, the government support has been ignored with the aim at estimating the extra cost of living for disabled people. In the second stage, the government support is included in the models to examine whether subsidy has any effects on standard of living for disability. The statistical results from OLS and ordered logit regression are compared in order to evaluate the consistency and the best model.

**Data**

Primary data is collected from direct interview of a head or any member of each household with and without disability. The questionnaire contains four sections, including information on household, information on the head of household, information on the disabled person and information about standard of living of household.

The sample frame is from the list of members of Disabled Person Organization of Danang City. Non-probability sampling is chosen to take the direct interview. This is the suitable way to collect reliable answers with willing attitudes from interviewees.

According to Lwanga and Lemeshow (1991), the sample size needed for a province in health studies is 207 if we want to have a representative sample at provincial level. We conducted interview 207 households with one disabled person from 16 years old in 7 districts of Danang City. The final sample included 414 households divided equally between those with disability and those without disability.

## IV. Results

### *Characteristics of surveyed households*

The characteristics of the final sample are described in Table 3. The two groups of households (with and without a person with disability) are similar in terms of distributions by geographic location, size of household, and number of children in household. The high proportion of urban residents with over 85% is mostly contributed by the population distribution within the Danang City. The percentage of household heads who are female are higher for households living with disability (27.1%) than those living without disability (11.1%). Similarly, households with disability are more likely to have heads who are not married at present (28.5% compared with 7.7%) or are above the age of 60 (39.6% compared with 15.5%). One possible interpretation of these differences is that households with disability are more likely (than those without) to be led by single mothers, single aunts, or grandparents who are left with the responsibility of caring for the person with disability. Consistent with this interpretation is the fact that households with disability tend to be somewhat larger (43.5% have 5-6 members) than those without (33.8%).

**Table 3:** Characteristics of the surveyed households

Characteristics	Households with disabled person		Households without disabled person		Total households	
	N	%	n	%	n	%
Overall	207	100	207	100	414	100
Geographical location						
▪ Urban	176	85.0	189	91.3	365	88.2
▪ Rural	31	15.0	18	8.7	49	11.8
Gender of the household's head						
▪ Male	151	72.9	184	88.9	335	80.9
▪ Female	56	27.1	23	11.1	79	19.1
Age of household's head						
▪ Under 25	0	0	4	1.9	4	1.0
▪ 25-59	125	60.4	171	82.6	296	71.5
▪ From 60	82	39.6	32	15.5	114	27.5
Marital status of the household's head						
▪ Married	148	71.5	191	92.3	339	81.9
▪ Others	59	28.5	16	7.7	75	18.1
Size of household						
▪ 2 - 4 members	117	56.5	137	66.2	254	61.4
▪ 5 - 6 members	90	43.5	70	33.8	160	38.7
Number of children in household						
▪ ≤ 2 children	195	94.2	199	96.1	394	95.2
▪ > 2 children	12	5.8	8	3.9	20	4.8

The percentage of people in each household who gain income from working is lower in households with a disabled person (51.5%) than in households without a disabled person



(64.6%) as shown in Table 4. Moreover, the more severe is the disability, the lower this percentage tends to be. This might be because the more severe the disability, the less likely the disabled person is able to gain employment, and the greater the amounts of time and effort the other family members need to spend on caring for the disabled person, and therefore the lower their labour participation rates.

**Table 4:** Percentage of people in each household who are gainfully employed

	Households without disabled person	Households with disabled person				Subtotal
		No difficulty	Some difficulty	Severe difficulty	Cannot do at all	
N	207	15	86	65	41	207
Mean (percent)	64.6	64.9	54.1	49.5	44.5	51.5
Std. Deviation	20.9	25.1	17.9	14.0	15.0	17.5
Min (percent)	16.7	33.3	20	20	20	20
Max (percent)	100	100	100	75.0	83.3	100

Annual income households with a person with disability (131.68 million VND) were much lower than that of the households without a person with disability (252.29 million VND) as shown in Table 5. In addition, annual income decreases from 239.20 million VND to 95 million VND when the severity of disability of disabled person in surveyed households increases. It can be explained by the low percentage of people gaining income from working in households.

It is noted that the cost of living for households with disabled people is higher than that without disabled people (Minh et al., 2015) to compensate the disadvantages. In addition, households with disabled people actually have less income and tend to have more family members to share this income. These reasons make the standards of living of households with disabled people worse off than those without disabled people.

**Table 5:** Distribution of annual income of the surveyed households

	Households without disabled person	Households with disabled person				Subtotal
		No difficulty	Some difficulty	Severe difficulty	Cannot do at all	
N	207	15	86	65	41	207
Mean (million VND)	252.29	239.20	155.75	98.14	95.00	131.68
Std. Deviation	151.34	89.85	69.91	71.05	48.55	79.36
Min (million VND)	18	42	36	18	13	13
Max (million VND)	780	360	324	360	192	360
F	94.932	25.143				
Sig	0.000	0.000				

As shown in Table 6, the prevalence of disability is slightly higher among females than it is among males. The prevalence of disability among females is 53.6% while it is 46.4% among males aged 16 or older. In the sample, disability is largely a phenomenon among the working age. The prevalence of disability among the working age from 25 to 59 is as high as 62.8%, while it is 26.6% among the elderly and the only 10.6% is among youth aged 15 to 24 years old.

It is found that over 40% of the disability is caused by accident, including war, traffic and work accident. About a quarter of the respondents reported that their disability is caused by diseases and other quarter is caused “born with”. Although the American war ended a long time ago, its consequences are still present in the disability data with 14 respondents disabled because of Agent Orange.

**Table 6:** Characteristics of the surveyed disabled people

	Severity of disability				Total
	No difficulty	Some difficulty	Severe difficulty	Cannot do at all	
<b>Gender and age of disabled person</b>					
<b>Female</b>	9	72	32	19	111
▪ 16-24	3	5	2	2	12
▪ 25-59	3	16	22	9	64
▪ Over 60	3	51	8	8	35
Chi-square: 1.274 Sig: 0.735					
<b>Male</b>	6	35	33	22	96
▪ 16-24	3	2	2	3	10
▪ 25-59	3	30	19	14	66
▪ Over 60	0	3	12	5	20
Chi-square: 9.393 Sig: 0.025					
<b>Perceived origin of disability</b>					
▪ Agent Orange	0	0	7	7	14
▪ Accident	9	41	26	12	88
▪ Born with	3	22	15	12	52
▪ Disease	3	23	17	10	53
Chi-square: 19.035 Sig: 0.025					
<b>Employment of disabled person</b>					
▪ Yes	8	39	14	0	61
▪ No	7	47	51	41	146
Ratio of Y/(Y+N)	0.53	0.45	0.22	0.00	0.29
Chi-square: 33.641 Sig: 0.000					
<b>Total</b>	<b>15</b>	<b>86</b>	<b>65</b>	<b>40</b>	<b>207</b>

The population of people with severe and very severe disabilities accounted for about 31% and 19.3% of the total population respectively. In recent year, people with severe or very

severe disabilities receive monthly subsidy and health insurance card from the disability Danang Government programs. More than 40% of the disabled people aged 16 or older live with some difficulties in daily activities and do not receive any support from Government. Unfortunately, the Government's resources for social support programs in general and disability programs in particular are very limited (Minh et al, 2015).

The proportion of disabled people having job is quite low with 61 out of 207 respondents. It is not strange for the low proportion because of poor health, lack of education, lack of career opportunity, and inferiority complex. Furthermore, the more severe the disability is, the less likely that the person is employed.

***Estimating the extra cost of living with disability***

In Table 7, the parameter estimates of the two econometric models including the OLS and ordered logit models are used in estimating the extra cost of living with disability. All the coefficients on log household incomes were significantly positive in both the OLS and ordered logit models. Both coefficients on the disability variable are negative (-0.021 with sig = 0.119 in OLS and -0.665 with sig=0.000 in ordered logit model), implying that there is a difference in standard of living between household with and without disabled people and the standard of living of household with disabled people is lower than that of household without disabled people.

The cost of any disability as a percentage of annual household income estimated using the OLS model and the ordered logit model were 3.19% and 6.53% respectively. Therefore, the extra cost of living for people with disability in Danang City in absolute terms is 4.2 million VND (210 USD) in OLS model and 8.6 million VND (430 USD) in ordered logit model compared to household without disability.

**Table 7:** Parameter estimates of the two econometric models for estimating the extra cost of living with disability

	OLS		Ordered logit model	
	Coefficient	Sig	Coefficient	Sig
Annual household income	0.659	0.000	10.189	0.000
Disability	-0.021	0.119	-0.665	0.010
R-squared (Pseudo R <sup>2</sup> )	0.79		0.708	
Estimated cost of living with disability as a share of income (%)	3.19		6.53	
Mean of annual income distribution of the surveyed households with disabled people	131.68 million VND			
Extra cost of living for people with disability	4.2 million VND = 210 USD		8.6 million VND = 430 USD	

The extra cost of living in this study is lower than the estimate of 11.5% of total household income by Mont and Cuong (2011) and 8.8-9.5% by Minh et al. (2015). However, in absolute terms, the extra cost of living in this study is higher than the estimate of 200-218 USD by Minh et al. (2015). It can be explained by the inflation in the period of 2011-2016 and the

scope of this research in the context of Danang City. It is significantly lower than the studies in developed countries including 14%-50% of UK (Zaidi & Burchardt, 2005), and 8.5%-44.4% of Ireland (Cullinan et al., 2011).

Table 8 shows the estimated extra cost of living with disability by severity of disability. The more difficultly disabled people have suffered in the daily activities, the more extra cost of living would be. For households with a disabled person that cannot do at all in his/her daily activities, the estimated cost of disability is 14.0% and 24.5% (in OLS and ordered logit model respectively) of annual disposable income. For those disabled people who meet severe difficulty in their daily activities the estimated cost of disability is 17.7% and 21.7% of annual disposable income. The corresponding estimate for those individuals with a disability who meet some difficulties in the daily activities is considerably lower at 0.7% and 3.5% (in OLS and ordered logit model respectively). This result of this study is consistent with the previous studies in UK (Zaidi and Burchardt, 2005), Ireland (Cullinan et al., 2011) and Vietnam (Mont and Cuong, 2011, Minh et al., 2015).

**Table 8:** The estimated annual cost of living with disability by severity of impairment

	OLS		Ordered logit model	
	Coefficient	Sig	Coefficient	Sig
Annual household income	0.609	0.000	9.865	0.000
D1	-0.085	0.000	-2.413	0.000
D2	-0.108	0.000	-2.143	0.000
D3	-0.004	0.800	-0.350	0.246
D4	0		0	
R-squared (Pseudo R <sup>2</sup> )	0.809		0.734	
Estimated cost of living with disability as a share of income (%)				
▪ Cannot at all	14.0		24.5	
▪ Severe difficulty	17.7		21.7	
▪ Some difficulty	0.7		3.5	
▪ No difficulty	0		0	
Extra cost of living for people with disability				
▪ Cannot at all	13.30 million VND = 665 USD		23.28 million VND =1164 USD	
▪ Severe difficulty	17.37 million VND = 869 USD		21.30 million VND = 1065 USD	
▪ Some difficulty	1.09 million VND = 54 USD		5.5 million VND = 273 USD	
▪ No difficulty	0		0	

### ***The impact of government subsidy on standard of living for people with disability***

In regard to the question whether the government support influences on standard of living, the government subsidy is included in the model as shown in Table 9. Our results show that the subsidy has a statistical significant effect on standard of living in both OLS and ordered

logit model, but it has an opposite direction on the standard of living. Using the OLS model, the coefficient has a negative effect on the standard of living. We argued that this unexpected result may come from the disadvantages of average asset index. Using the ordered logit model, a positive coefficient indicates that if the Government support for disabled people in terms of monthly subsidy and insurance card, people with disability will improve their standard of living a little bit. Although the subsidy variable in this model just is a dummy variable, it raised a question related to the city governmental policy in Danang city in line with vision of a livable city.

**Table 9:** The impact of government subsidy on standard of living for people with disability

	OLS		Ordered logit model	
	Coefficient	Coefficient	Sig	Sig
Annual household income	0.260	0.000	4.159	0.000
Disability status	0.000	0.989	-0.297	0.280
Government subsidy	-0.053	0.003	1.125	0.002
R-squared (Pseudo R <sup>2</sup> )	0.789		0.718	

### *Budgetary implications to help people with disability*

Table 10 shows the estimated additional budget for a household as a result from running the ordered logit regression. The figures show that the subsidy policy has a significant effect on the standard of living among disabled people. Although the ratio of subsidy to extra cost is still low, this subsidy policy is a part of socio – economic development strategy with the aim at improving standard of living for disabled people in general. In addition, there is discrimination in financial supports for disabled people with some difficulties. This disabled group is marked a question about the current policy.

**Table 10:** The estimated additional budget for a household with one disabled person

Disability status	Annual subsidy (million VND)	Extra cost (million VND)	Difference for a household (million VND)	Ratio of annual subsidy over extra cost	No of disabled people*	Budget (million VND)	Additional budget (million VND)
Cannot do all	7.10	23.28	16.18	0.31	1,878	43,720	30,386
Severe difficulties	5.48	21.30	15.82	0.26	9,185	195,641	145,307
Some difficulties	0	5.45	5.45	0	8,865	48,314	48,314
<b>Total</b>	-	-	-	-	<b>19,928</b>	<b>287,675</b>	<b>224,007</b>

\* Source: Danang Department of labour, war invalids and social affairs

Estimating extra cost of living due to disability is systematic approach for local governments to build up budget for disability people. Clearly, the current annual subsidy falls short of the extra cost of living with disability in Danang City (appropriate 22%). The Municipality Government should develop a long-term financial strategy to allocate a suitable annual budget to provide further financial support for disabled people who face difficulties, and to

reduce this gap in living standards between people with and without disability in general, and between various groups of people with disability.

In addition, Danang makes an effort to increase more generous donations from charitable organizations, non-governmental organizations and enterprises at home and abroad, as well as from the community to help people with disability in Danang. Up to now, there has been a number of organizations which have supported disabled people in Danang, including Special Fund for the Disabled of International Committee of the Red Cross, United States Agency For International Development and Vietnam Assistance for the Handicapped.

More importantly, local government should focus much more on the sustainable support such as vocational training and job creations for people with disabilities or loans support for households with disabled people to do business. While the unemployment rate in Danang in 2016 is 3.6%, just 29% disabled people in our survey have a job. Therefore, job creation for disabled people with monthly salary is considered as an effective solution to increase their standards of living and integrate into the society.

Decreasing the number and the severity of disabled people is also a good way to lighten the burden of the Municipality Government. Disability prevention programs should be introduced to raise the awareness about disability, help community to prevent disability, improve early detection and treatment of disability. Besides, it is necessary to raise awareness of disabled people about benefits of treatment/ rehabilitation and strengthen the quality of health services for people with disabilities so that they have perseverance and faith in treatment and rehabilitation, leading to the decrease in the number and severity of disabled people in recent years.

## **V. Conclusion and implications**

The results indicate that extra cost of living of household without disabled people is higher than that of household with disabled people; the subsidy from government increases the standard of living for households with disability. These results imply some important implications. Firstly, the current annual subsidy has not covered enough the extra cost of living for disability in Danang city. In line with a vision to be a livable city, Danang Government should have a long-term financial strategy in order to allocate a suitable annual budget to reduce a gap between people with and without disability. Secondly, the existence of extra cost of living for disabled people who face some difficulties suggest that it is necessary for policy makers to initiate the financial supports for this groups to reduce a gap between people with and without disability in general, and among people with disability. Finally, the extra cost of living in Danang city is still behind. It is expected to help the policy makers in Danang city to prepare a budget for disability in the future.

There are some limitations which should be noted in this paper. The reliability of the estimation of disability costs by applying standard of living approach depends on the measurement of the standard of living variable (Minh et al, 2015) which is affected by this switch in consumption patterns (Zaidi & Burchardt, 2005). Additionally, the sample size should be larger to make the sample become more representative of Danang, one of third biggest city in Vietnam.

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## Appendix - A summary of previous studies

No	Name of article	Authors	Year	Location	Objectives	Dep Var	Independent variables			Technique
1	<i>Comparing incomes when needs differ: Equivalisation for the extra costs of disability in the UK</i>	Zaidi, A., et al	2003	UK	Quantifying the cost of living	Standard of living	Income	Dis status	Other control variables	OLS Order logic regression
2	<i>Estimating the extra cost of living for people with disability</i>	Cullinan J., Gannon B. and Lyons S	2011	Ireland	Estimate the long run cost of living	Standard of living	Income	Dis status	Other control variables	Panel ordered probit regression
3	<i>Estimating the extra cost of living with disability in Vietnam</i>	Minh et. al	2015	VN	Estimating the extra cost of living	Standard of living	Income	Dis status	Other control variables	OLS Order logic regression
4	<i>Disability and poverty in Vietnam</i>	Mont, D., and Cuong, N.	2011	VN	Relationship bet. Dis and poverty	Poverty		Dis status		Order logic regression
5	<i>Disability and poverty: A survey of World Bank Poverty Assessments and implications,</i>	Braithwaite J. and Mont D.	2009	VN & Bosnia	Relationship bet. Dis and poverty	Poverty		Dis status		OLS



