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**Multidimensional Exclusion Analysis on  
Indigenous Social Welfare Policy:  
Empirical Evidences from Social Change  
and Policy of Taiwanese Indigenous Peoples  
Survey**

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## **Abstract**

*Introduction:* Indigenous people often encounter social exclusion from mainstream society in many countries of the world. Previous studies indicate that social exclusion of indigenous peoples is a multidimensional process characterized by geographic remoteness, settlement isolation and racism. However, little is known about the multiple disadvantages in different domains of social welfare system that are experienced by indigenous Taiwanese. The objective of this study is to address the indigenous social exclusion by focusing on their accessibility to social welfare benefits.

*Methods:* The data used in this study was drawn from the Social Change and Policy of Taiwanese Indigenous Peoples Survey in 2007, which included 2,040 respondents. This study employed several binary and ordered logistic regressions to examine the extent to which factors of ethnicity, community participation, and socio-demographic characteristics are associated with the likelihood of being excluded from receiving different kinds of social welfare payments.

*Results:* The results showed that more than one third of respondents faced at least three dimensions of social welfare exclusion by having difficulty in accessing medical and health, housing, and financial supports. Logistic estimation of different exclusion equations revealed that the likelihood of being excluded from social welfare payments are higher for those who are plains indigenes, live outside of designated indigenous areas, and less participated in local organization when compared to their counterparts. However, the significance testing results and the effects of other explanatory variables on social exclusion varied across different models of social welfare payments.

*Conclusions:* This study provided empirical evidence of multidimensional disadvantages of indigenous peoples, such as exclusion from receiving cash payments from different social welfare benefits. The main policy implication can be inferred for the multidimensionality of indigenous social exclusion. Stronger physical and social solidarity among indigenous peoples can effectively contribute to enhance social inclusion and accessibility to multiple social welfare resources including preservation and maintenance of indigenous traditional territory, encourage and enhancement of participating in local community organizations.

**Keywords:** Social Exclusion, Multidimensionality, Indigeneity, Indigenous peoples, Taiwan

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# **Multidimensional Exclusion Analysis on Indigenous Social Welfare Policy: Empirical Evidences from Social Change and Policy of Taiwanese Indigenous Peoples Survey**

## **Introduction**

Indigenous peoples suffer from colonization, racism and being socially excluded from mainstream society both in developing and developed countries (Linacre, 2002; Justino and Litchfield, 2003; Hanson, 2008; Gurung, 2009). Although most of indigenous peoples still preserve their languages, customs, living territory and tribal settlement social structure in Taiwan, they face persistent social problems and locate within disadvantaged socioeconomic structures. For example, Taiwanese aborigines have shorter life expectancy, less educational achievement, lower family income, higher rate of single parent families and unemployment than non-indigenous counterparts (Chiu, 2008; Chang, Lin and Liu, 2010; CIP, 2013). An increasing body of literature indicates that racial discrimination has confined ethnic minority to access to health care, housing, education, employment, public services and social protection schemes (Dixon and Scheurell, 1995; Scutella, Wilkins and Horn, 2009; Wang, 2015). Exclusion from social resources refers not only to availability, but also to accessibility and affordability by different ethnic groups. Previous studies pointed out that rural-urban disparity in accessing to public resources is often pronounced. Apart from the limited access to public services in rural areas, more serious exclusion is the case for indigenous peoples in the highlands and mountains than rural residents (Spoor, 2008). Therefore, the indigenous social exclusion is regarded as a multidimensional process, characterized by geographic isolation, racism and socio-economic disadvantages.

The multidimensional social exclusion refers to a process of progressive dissociating specific groups or individuals from participating in normal social system and institutions (Silver, 2007). The indigenous peoples are confined accessing rights, opportunities, and resources that are available to most other people in society. This limited access causes negative impacts on their employment and income, quality of life, education and health status (Spoor, 2008; Scutella, Wilkins and Horn, 2009). Therefore, the indigenous social exclusion is suggested to be measured in several dimensions, for example, material resources, employment, education, medical and health care, community and personal safety. Levitas et al. (2007) further indicated that material resources, access to public resources and social benefits are the most important domains for the multidimensional social exclusion. However, little is known about the multiple deprivations in accessing social welfare programs that are experienced by indigenous Taiwanese.

Given that cash benefits of social welfare programs are the most important public

support to secure materials living conditions of indigenous peoples. From a perspective of social policy, this study focuses on association between welfare payment delivery and selected determinants to explore multiple disadvantages of indigenous peoples in Taiwan. To fill this knowledge gap, the main objective of this study is to address the indigenous social exclusion for paying special attention to their accessibility to social welfare benefits. In addition, this study employs several binary and ordered logistic regression models to examine indigenous social exclusion in multiple dimensions by using a national sample of Taiwanese Indigenous Peoples Survey from Social Change and Policy in 2007.

## **Literature review**

### **Multi-dimensionality of social exclusion**

The term social exclusion originated in Europe and was regarded as an extended notion of poverty which focused on social problems of specific individuals or groups being denied access to rights, opportunities, resources and public services that are normally available to most other people in society (Finer and Smyth, 2004; Levitas et al., 2007). Social exclusion refers to the processes and outcomes in which marginalized groups are systematically excluded from full engagement in civic life (Sen, 2000; Wang, 2015). The systematic exclusion of certain communities of people include lacking access to or disadvantage in housing, employment, healthcare, democratic participation and social activities. Previous studies demonstrate that multiple exclusion is a phenomenon, detaching specific groups or deprived area from social relations and institutions, as well as preventing them from normal participation in the society (Silver, 2007; Levitas et al., 2007). The multi-dimensionality of social exclusion refers to exclusion across more than one domain of disadvantage, resulting in negative consequences for individual well-being and quality of life.

From the multidimensional approach, multiple exclusions are captured by three dimensions, including exclusion from economic life, social services, and civic life and social networks. Kostenko, Scutella and Wilkins (2009) proposed more complicated dimensions for understanding social exclusion which covered material resources, employment, education and skills, health and disability, social, community and personal safety. Also, Ward, Walsh and Scharf (2014) presented a series of multiple exclusion dimensions which composites social and cultural participation, personal relationships, social support and services, living amenities and facilities, transport and mobility, health care, material and financial resources, personal safety and crime.

More sophisticated, Levitas et al. (2007) points out three main domains which are potential importance in social exclusion, including resources, participation and quality of life. The first and most important dimension is resources deprivation which refers to lack access to economic and material goods, public resources and services. The lack of basic material necessities leads to an increasing risk of poverty and social exclusion. Given that income is the most obvious indicator of material and economic resources, there are increasing policy literatures addressing the importance

of social security programs on lowering risk of poverty and reducing economic hardship for the disadvantage group (Gordon et al., 2000; Burchardt, Grande and Piachaud, 2002). In addition to resource accessibility of social exclusion, participation in social, cultural, educational and political activities, as well as health status, happiness, living environment, crime and personal security are the other relevant domains reflecting individual well-being (Levitas et al., 2007). The most comprehensive attempt to specify comparable indicators of social exclusion is the European social statistics referred to common social indicators within the EU (Atkinson et al. 2002; Eurostat, 2002; Devicienti and Poggi, 2011). Many of them are associated with economic resources and define material shortage as one important aspect of social exclusion.

Since that the indigenous peoples are ethnic minorities and often resident in rural remoteness, they are one of the most disadvantaged groups both in developing and developed countries (Justino and Litchfield, 2003; Gurung, 2009). Take the Australia indigenous policy for example, SCRGSP (2014) emphasizes that indigenous disadvantage is multidimensional and argues that indigenous exclusion is different to other forms of social exclusion in Australia. Therefore, Australia government provides the Overcoming Indigenous Disadvantage (OID) framework to describe the multidimensional nature of indigenous disadvantage. Several key indicators and domains of the OID are selected as follows, life expectancy, employment, disability and chronic disease, household income, family and community violence, governance, leadership and culture, early child development, education and training, healthy lives, economic participation, home environment, safe and supportive communities.

Although there is an increasing awareness of the importance of multi-dimensionality of social exclusion, no consistent conclusion can be drawn regarding the extent, typology and contents of measuring multiple exclusion. Considering theoretical integrity, existing welfare benefits and data availability, this study divides the multiple social exclusion into five domains, including medical and health, housing, financial, education and old-age exclusion. For health exclusion is specified as inaccessibility to resources, services and opportunities to improve or preserve in a healthy status, such as National Health Insurance coverage, medical advices, living allowance and rewards on recovery from the illness (Cheng and Lee, 2010). According to European typology on social exclusion, housing exclusion is the people who lived in the places where are insecure, inadequate or overcrowded (Edgar et al, 2007). Financial exclusion refers to those people who have difficulties in acquiring proper channels to financial supports from traditional market or public sector (Levitas et al., 2007). Child and youth without sufficient out-of-home care or they have problem participating in regular school activities is described as education exclusion (Wang, 2015). Old-age exclusion refers to social relations, mobility, neighborhood and community and pension right (Ward, Walsh and Scharf, 2014).

In conclusion, social exclusion is a powerful disrupter of the development of social sustainability. Because that its multi-dimensionality will restrict access of disadvantage groups to resources and opportunities to participate socially,

economically and civically (Zubrick et al., 2005). Although material resource does not refer simply to cash availability, income security is still the foundation of quality of life. Limited access to economic material resources is likely to contribute to further exclusion not just from economic life, but from the other life dimensions as well. Therefore, the provision of cash benefits is recognized as direct and effective instrument for removing the barriers to social inclusion throughout the social policy literature (Smyth and Finer, 2004). With respect to overcoming social exclusion systematically, governments often spend lots of efforts on legislation and social welfare programs to reducing or preserving inequitable exclusion of specific groups (Zubrick et al., 2005; SCRGSP, 2014). This study concentrates on cash payment of different social welfare programs by measuring social excluding from access to public services and welfare benefits. The detailed operational definition and measured of multidimensional social exclusion and independent variables will be described in the further section.

### **Determinants of indigenous social exclusion**

Social exclusion is the result of mutually reinforcing deprivations in above mentioned dimensions. Previous studies have identified several determinants that have an impact on or are associated with social exclusion (Spoor, 2008; Wang, 2015). Of these, gender, age, ethnicity, education and religion, as well as some particular status linked to income, health, employment, institutional system and residential location of the individual may directly or indirectly affect social exclusion. The ethnic minority is the main reason for indigenous peoples being excluded. Racism limits indigenous peoples to access to public resources and services and eliminating this problem has become an important issue for social policy formation. Several argumentations addressed that institutional racism and discrimination barricaded indigenous peoples to benefit from social systems because they are disadvantaged groups often living in deprived rural area with very limited choices (Henderson, et al., 2007; Spoor, 2008).

Due to differences in research subjects, years studied, data sources, and domains and measures of social exclusion, previous studies drew inconsistent conclusions pertaining to the relationship between selected determinants and social exclusion. For example, those living alone, being older, having low income, having no private transport or not owning their accommodation are likely to be excluded from material resources (Barnes, 2005; Huang, Guo and Tang, 2010). Similarly, being female, ethnic minority group, living alone, having no partner, children or siblings or being unemployed are risk factors for exclusion of social relationships (Hunter and Jordan, 2010; Devicienti & Poggi, 2011). Although previous results show that possible determinants do not have the same effect on each exclusion dimensions. The influence of socio-demographic characteristics, household features and environmental factors on indigenous social exclusion is well documented (Levitas et al. 2007; Chiu, 2008; Wang, 2015). Their findings revealed several key characteristics that are most likely related to indigenous peoples experiencing multiple social exclusion, including age, gender, ethnicity, education, income, family type, employment, residence, mobility, and membership of originations.

Furthermore, the social exclusion in the rural area is a widespread phenomenon. However, the spatial difference in social exclusion is also diverse among rural areas. Take the indigenous region for example, the specific environment where an area dominated by indigenous ethnic majority is not only characterized by legal frameworks (e.g. traditional territory) but also by specific locality (e.g. distinct tribal culture and lifestyle) and natural circumstance (e.g. remoteness and geographic accessibility). These spatial factors interact with individual risk factors stemming from personal characteristics to produce different patterns and levels of exclusion.

The importance of distinguishing between macro-drivers that might increase the overall levels of social exclusion, such as rural remoteness or small-scale farming society causes or correlates of individual vulnerability. Therefore, the role of indigeneity is crucial to understanding the indigenous social exclusion. The World Bank indicated that indigeneity can be identified in particular geographical areas by the presence of specific characteristics, such as close attachment to ancestral territories and natural resources, presence of customary cultural and social institutions, and primarily subsistence-oriented production (Davis and Williams, 2001). There is enormous evidence that indigeneity is a major risk factor in almost all domains of exclusion that indigenous peoples have been explored (Davis and Williams, 2001; Levitas et al., 2007).

The indigeneity referred not only to as indigenous ethnic minorities but also their embedded characteristics of geographical areas. First, the ethnic indigeneity means that those who self-identified as a distinct ethnic group. In spite of the diversity of cultures and living condition of different indigenous peoples, they share common inherencies and group identities and differ from the dominant society (Dockery, 2010; Perales, Baffour, & Mitrou, 2015). Such an indigenous feature is a manifest factor for social exclusion and causes ethnic minority more likely to face disadvantaged situation than ordinary peoples in the large society (Pierson, 2002). The indigenous culture is tradition-oriented and kinship -based tribal lifestyle and further shapes indigenous institutions. Examples include distinct social norms, values and arrangements, strong mutual support system and network, as well as elders' councils and chieftainship for organizing political, economic and social activities (Merlan, 2007; Chiu, 2008).

In addition to ethnic differences, physical indigeneity displays higher than average rates of geographic immobility, residence of traditional territory, hunter-gatherer or farming livelihood still being prevalent in remote rural areas. Previous studies demonstrate that indigenous ethnic minorities and remote residence are likely to make them vulnerable to being disadvantaged in the development process (Wen et al., 2004; Wang, 2015). In spite of steady improvement in indigenous socio-economic status in the last two decades, they are still relatively worse than other Taiwanese peoples in education, employment, income and health and tend to live in remoter, more deprived rural areas than other Taiwanese peoples. As a result, indigenous peoples experience substantially higher prevalence of social exclusion than other non-indigenes. Inasmuch as our study focused on accessibility of social welfare delivery for indigenous peoples rather than general social exclusion issues.

We thus expect that our empirical analysis might point towards divergences by indigenous ethnic background and traditional remote residence to influence social welfare exclusion.

### **Overview of indigenous social welfare programs in Taiwan**

According to official statistical report, there are over half million indigenous people and account for 2.3% of total population in Taiwan in 2008. Although, their socio-economic status and living conditions are relative worse than majority people in many facets, including life expectancy, health, employment, income, education (Chiu, 2008; Chang, Lin and Liu, 2010; Wang, 2015). However, indigenous growth rate increased by 2.1%, higher than 4.7% of total population growth, compared to 2007. The increasing population and getting younger structure of indigenes is likely resulting from expanding coverage of indigenous social welfare program gradually (DGBAS, 2008; CIP, 2008).

The Council of Indigenous Peoples (CIP) has officially recognized 14 tribes of indigenous peoples, mainly distributed in the east coast and southern, central and northern mountain area of the island. Also, Taiwan government has designated 55 indigenous areas from 357 townships in 2002, including 30 highland/mountain townships and 25 plain townships (Chang, Lin and Liu, 2010). Although most of indigenous tribes still preserve their languages, customs, living territory, tribal settlement and social structure, they face impact of rapid modernization. Considering ethnicity and geographical residence, the indigenous peoples are divided into two categories, namely plains tribes and mountain tribes (Chang, Lin and Liu, 2010; Wang, 2015). The plains indigenous peoples mainly lived in rural village of plains region and estimated to number between 150,000 and 200,000. Nevertheless, these plains indigenous peoples are not even recognized as ethnic groups, and thus have no minority group status in Taiwan. On the contrary, mountain tribes refer to those indigenous peoples traditionally live in highland areas (Hsu, 2012). Due to ethnic minorities, geographic remoteness, spatial isolation and natural constraints, the mountain indigenous peoples is characterized by insufficient human capital, poor and difference in culture, they become among the most marginalized groups in the country (Chiu, 2008).

Considering developmental problems and specific needs of indigenous peoples such as remoteness, natural constraints of livelihood, lower life expectancy at birth and higher unemployment rate, and the government has enforced a number of national laws to protect the rights of indigenous peoples, including the Regulations of Recognition of Indigenous Peoples, the Education Act for Indigenous Peoples, the Indigenous Peoples Basic Act since the early 2000s (CIP, 2013). Among these legislations, the Indigenous Peoples Basic Act, passed in 2005, obligates the government to provide resources to support indigenous groups develop a system of self-governance, formulate policies to protect their basic rights, and promote the preservation and development of their languages and cultures.

The indigenous basic law aims to recognize, protect, and promote the

fundamental rights of indigenous people, as well as enhance and ensure their sustainable socio-economic development (CIP, 2005). In line with the spirit of the 2007 United Nations declaration on the rights of indigenous peoples, the Council of Indigenous Peoples has been promoting social welfare policies for Taiwan's aborigines (CIP, 2005). According to the Indigenous Peoples Basic Law, Article 24-28 regulate that the government shall implement public health and health care policies to improve indigenous peoples' physical well-being and overall health.

With considering the difference in the indigenous cultures, needs and uniqueness of living environment, the CIP has conducted a series of social welfare programs that differed from general population to assist indigenous peoples in health care, housing, education, employment and as well as to safeguard their economic security. The indigenous social welfare measures include lowering the standards for living-assistance subsidies, economic security, medical and health subsidies, housing and supportive programs, children and youth educational benefits, social insurance subsidies, and other social work services (DGBAS, 2011). Different previous studies (Dixon and Scheurell, 1995; Cheng and Lee, 2010; Wang, 2015; ) we merely focus on cash benefits of indigenous programs social welfare, because that social security payment is aimed at secure directly material livelihood.

Other than various living support services, economic security oriented welfare benefits designed to maintain basic financial security of indigenous peoples. According to the official regulations of social welfare benefits (DGBAS, 2011), the indigenous health allowance contains National Health Insurance (NHI) subsidies, medical transportation subsidies, and nutrition subsidies. For example, the transportation subsidies for seeking medical advices are between NT\$ 300 and 500 per time depending on resident location and maximum 10 times per year. For the housing subsidies, preferential loans or interest subsidies for building and repairing house are offered to middle- and low-income indigenous families or living in remote indigenous area.

In case of emergency situation caused immediate risk to health, life or property damaged, the indigenous peoples can also apply for several financial supports. The aid for emergency for indigenous includes funeral subsidies, aid for medical-care, aid for disaster, unemployment assistance and emergency assistance for livelihood. The education allowance for indigenes comprises child-care, tuition and teaching subsidies for indigenous child, education subsidies for low or mid-income indigenous student, lodging and meal allowance for indigenous student, scholarship for education development and tuition subsidies for indigenous university students. The education subsidies for indigenous student vary from NT\$ 2,000 to 20,000 per semester, for attending primary school to colleges. Moreover, those indigenous seniors aged over 55 years are eligible to receive the old-age indigenes' welfare living allowance (NT\$ 3,000 per month), if they do not participate in any social pension program.

## **Methods**

### **Data**

Data used in this study is drawn from the “Social Change and Policy of Taiwanese Indigenous Peoples Survey” in 2007, conducted by the Institute of Ethnology in Academia Sinica (Chang, Lin and Liu, 2010). The survey aimed indigenous peoples and adopted a systematic sampling scheme which took the indigenous population characteristic into consideration. After dropping missing value of crucial items, such as social welfare exclusion, our data includes 2,040 respondents in the empirical analysis. Using the nationally representative indigenous survey, we construct a set of measure of multidimensional social exclusions for each individual that distinguishes five dimensions of social welfare program, including cash payments of medical and health, housing, financial, education and old-age allowances. To explore multidimensional exclusions from social welfare benefits for indigenous people, this study employed several binary logistic regressions to examine the extent to which ethnicity, residence, social participation and socio-demographic factors are associated with the likelihood of excluding from receiving different social welfare payments, where appropriate.

### **Measurement**

To capture multidimensionality of indigenous social exclusion, the dependent variable is measured by accessibility of different social welfare payments, in terms of excluding from medical and health, housing, financial, education and old-age security benefits. With respect of social welfare exclusion, respondents of the “Social Change and Policy of Taiwanese Indigenous Peoples Survey” are asked the following question: “Have you ever received government provided social welfare benefits, including medical and health allowance, housing subsidy, financial aid for emergency, education subsidy and old-age security payment? ” If a respondent is eligible for needed social payments but does not receive them, then the respondent is defined as social welfare excluded and coded as 1 (=excluded).

The medical and health exclusion is measured as inaccessibility to NHI subsidies, transportation subsidies for seeking medical advices, or medical allowance for indigenes (the variable MEDICAL\_EX). Housing exclusion is defined as fail to receive needed subsidies of housing and living arrangement, or interest subsidies for building and repairing house for indigenes (HOUSING\_EX). Financial exclusion refers to those who have economic difficulties and could not acquire financial supports from public sector accordingly, such as aid for emergency, unemployment assistance, low interest loan, livelihood assistance, or funeral subsidies (FINANCIAL\_EX). Education exclusion is described as those who has enrolled school children and could not access to child-care and tuition subsidies, scholarships, or other education allowances for indigenous students (EDUCATION\_EX). Old-age exclusion is measured as those who has senior family member aged over 55 and could not receive old-age welfare living allowances or other social security payments for senior indigenes (OLD-AGE\_EX). Moreover, we sum up total number of excluding from aforementioned indigenous social payment to represent the multidimensionality of social welfare exclusion (NUMBER\_EX). Due to the ordinal scale of the dependent variable - NUMBER\_EX, we employed ordinal regression analyses to

examine the effects of the relevant determinants on multidimensional social exclusion. Similarly, the other dependent variable of different kinds of social welfare exclusion is documented as a binary variable (excluded = 1; not\_excluded = 0), this study uses several binary logistic regression models to examine the effects of selected factors on the likelihood of being excluded from different domains of social welfare payments, while controlling for individual socio-demographic characteristics.

The explanatory variables included in our analysis are built on the empirical specifications from the previous studies (Levitas et al. 2007; Chiu, 2008; Wang, 2015). Several variables of socio-demographic characteristics, household features, and community/area conditions are hypothesized to be associated with social welfare exclusion of indigenous peoples. In the analytic models, all nominal variables were treated as dummy variables, while indicators on ordinal and interval scales were treated as continuous measures.

The socio-demographic variables included: gender (male = 1), age (in years), ethnicity (mountain indigenous person = 1), education level (e.g. three dummy variables of primary or lower, junior high school, senior high school, and college or higher), and employment (employed = 1). Moreover, household features contain marital status (e.g. two dummy variables of married, single, and others), average household income per month (in NT\$ 10,000), and household size (in persons). Finally, number of community organizations (in number), participation in local organization (coded from 0 = never, 1 = seldom, 2 = sometimes, 3 = usually), and current residence (lived in traditional territory) were also specified indicating community or regional characteristics. Considering that the role of indigeneity is regarded as an important determinant of social exclusion (Dockery, 2010; Pe-Pua et al., 2010; Perales, Baffour, & Mitrou, 2015). We also use indigenous ethnicity (e.g. mountain indigenous person) and residence (traditional territory) of respondents to identify the indigeneity and its effect on social welfare exclusion in further analysis. The detailed operational definition and descriptive statistics of multidimensional social welfare exclusion and explanatory variables is shown in Table 1.

insert table 1 about here

## **Results**

### *Descriptive results*

Table 1 contains information on variable definitions and sample distributions of the multidimensional social exclusions and selected variables used in this study. Among the indigenous sample, 44% are male, with an average age of 42.31 years, 54% are registered as a mountain indigenous person, 33% of respondents have obtained senior high school while only 15% of them have completed college level education or higher, and 64% are currently employed. In addition, household features of the respondents show that 62% are currently married, have an average of 3.41 family members lived in a household, and the average household income is NT\$ 42,100 per month. For the community or regional characteristics, there are averagely 4.46 community organizations or associations in the local area, respondents seldom participate in

community organizations (mean = 1), and over half of the sample reported that they live in an indigenous area.

With respect to multi-dimensional social exclusion, overall, most of the respondents have experienced at least one dimension of social welfare exclusions. The percentage of non-excluded group accounts for 8.3%. In contrast, there are only 34 respondents not able to access all kinds of social welfare payments. Therefore, we combine all-excluded respondents into over four-dimensional excluded group which make up about 12%. On average numerous respondents suffer from more than two dimensions of social exclusion simultaneously (mean = 2.1). For specific dimension of social welfare exclusion, In summary, over half of total respondents are excluded from needed medical and health benefits, housing subsidies, and financial assistance. The medical and health exclusion and financial exclusion has the highest proportion (56%), while old-age exclusion has the lowest (17%).

### *Association between multidimensional social exclusion and selected variables*

In order to investigate the extent to which socio-demographic variables, household features and community/area characteristic may associate with multi-dimensionality of social exclusion, we divide excluded number of social welfare benefits into five categories, including non-excluded, from one- to four-dimension-excluded groups. Statistical test for multiple group comparison used in this study contains Pearson's chi-squared test for independent variables which are categorical and one-way ANOVA for variables which are continuous.

Table 2 shows that two-dimension-excluded group has the highest percentage (2\_dimen\_exclu = 31.72%), while non-excluded group has the lowest with 8.28% (not-excluded). In addition, those who have experienced exclusion from all kinds of social welfare benefit (4\_dimen\_exclu) accounts for 11.9%. As expected, the non-excluded group is the youngest, wealthiest, better educated, having less household members and higher participation in local organizations, when comparing the other groups. By contrary, respondents in four-dimension-excluded group are the eldest, poorest, and with more family members among all groups.

For socio-demographic characteristics, the result of chi-squared tests and ANOVA indicate that there are significant differences among the five groups in aspect of gender, age, ethnicity and education ( $p < .001$ ), except for employment. Comparing with not-excluded group, the respondents experienced more than four dimensional exclusions (4\_dimen\_exclu) is characterized by several features, including female, older and less educated. Moreover, the household and regional heterogeneity in accessing to social welfare payments is also significantly different among each group ( $p < .001$ ). However, there is no statistical difference found among social excluded groups with respect to the number of community organizations. In general, those who excluded from all social welfare payments (4\_dimen\_ex) were married, with more family members, lower household income, and less participated in local organization as compared with not excluded counterparts (not-excluded). Perhaps the most interesting finding is the association between indigeneity and multi-dimensional social exclusion. The proportion of mountainous indigene of each group is significantly

decreasing (chi-squared test = 32.85,  $p < .001$ ). From not-excluded to four dimensional excluded groups, the percentage accounts for 63%, 59%, 56%, 51% and 40%, respectively. Place of residence also matters for severity of indigenous social exclusion (chi-squared test = 37.68,  $p < .001$ ). A large proportion of respondents lives in an indigenous area and encounters fewer problems with receiving social welfare payment. The percentage of living in indigenous area is 55-57% for two or less dimensional excluded group.

insert table 2 about here

### ***Determinants of multidimensional social exclusion of indigenous peoples***

In order to gain insight into selected variables associated with an indigenous respondent's likelihood of experiencing multi-dimensional social welfare exclusion, six logistic regression models were completed. Table 3 displays the estimations of the several logistic regression analyses which include coefficients, standard errors, odds ratios (i.e.  $\text{Exp}(\beta)$ ) and significance levels. We begin our discussion of results by looking at the findings of the statistical tests (the bottom in Table 3). The likelihood ratio test statistic of  $M_{1-6}$ , Goodness-of-Fit value is 202.06, 50.16, 133.61, 283.23, 167.32 and 27.00 respectively, which is higher than the critical value at the 1% level ( $p < .001$ ). Therefore, we reject the null hypothesis that all slope coefficients are zero ( $H_0: \beta_1 = \beta_2 \dots = \beta_j = 0$ ).

In model 1 ( $M_1$ : Number\_ex), ordinal regression was employed to examine how household features and community/area characteristics affect excluded number of social welfare benefits, while controlling for socio-demographic variables. The respondents who were mountain indigenes, living in an indigenous area, higher income, and more actively participating in local organization were more likely to be included in receiving social welfare payment. On the contrary, those who were junior or senior high school graduates, married, and having more household members were more likely to experience more dimensions of social welfare exclusion, when compared with their counterparts. Take the role of indigeneity for example, the mountain indigenes were about 0.68 times less likely to suffer from multidimensional social exclusions than those who were plains indigenes ( $p < .001$ ). Also, those who lived in indigenous area were 0.64 times more likely to receive social welfare benefits successfully than their counterparts ( $p < .001$ ). These findings are plausible, inasmuch as Taiwan government has promulgated several laws and regulation (e.g. Indigenous Peoples Basic Act in 2005), as well as specific social welfare programs to protect rights, way of life and economic security of indigenous peoples.

Identical variables are adopted for the following binary logistic regression models, including medical and health allowance exclusion, housing subsidy exclusion, financial aid exclusion, education subsidy exclusion and old-age security payment exclusion, taking non-excluded as reference group for all models. Similar patterns were found across  $M_{2-6}$  estimations, while differences existed. In model 2 ( $M_2$  : Medical\_ex, 1 for excluded), age and divorced or widowed status (single is reference group) was positively associated with an increase in the proportional odds of being excluded from medical and health allowance. While the respondents are mountainous

people, more participated in community organization, and lived in indigenous area are more likely to access medical and health payment, compared to their counterparts, by 20%, 10%, and 26%, respectively. For housing exclusion ( $M_3$ ), our results find that those who are plains indigenes, with primary school or lower education, married, having more family members and living outside of indigenous area, are more likely to be excluded from housing subsidy, compared with their counterparts. In the financial exclusion model ( $M_4$ ), compared to those who have college or higher education, people who have junior high school or lower education is less likely to receive financial aid for emergency. In addition, the respondents have higher household income and often attend community organizations are more likely to be included in financial aid program. However, there is no statistically significant association found between indigeneity and financial aid exclusion. The exclusion model of education subsidy ( $M_5$ ) indicates that those who were elder, mountain indigene, employed, single, intensely participated in local organizations, and settled down in indigenous area, having higher probability of receiving education subsidy for their schooling children. In the old-age exclusion model ( $M_6$ ), the mountainous ethnicity, number of community organizations and indigenous residence are negatively associated with being excluded from old-age welfare program security payment. Those respondents are more likely to receive old-age security payment, comparing with their counterparts.

Although effects of explanatory variables on social welfare exclusion varied across different models, direction and significance of relevant determinants remained largely unchanged. Our study yields several interesting findings. For instance, we observe that the statistically significant effect of indigeneity on social exclusion in most of social welfare dimensions, except for the financial aid model. It is evident that the mountain indigenes and residence of indigenous area significantly contribute to reduce the likelihood of being excluded from social welfare benefits. The probable explanation is that the mountainous ethnicity and indigenous residence is convenient for social agencies to approach and deliver welfare payments to their targeted group. The mountain indigenous peoples and living in an indigenous area has better chance to maintain their family clans, ethnic identity, traditional lifestyle, mutual support system in local communities, and thus to enhance social solidarity and mobilize social welfare delivery. Due to the remoteness of indigenous area and isolated settlement of mountain indigenes, the indigeneity did not help combat social welfare exclusion, in term of financial aid for economic hardship. Furthermore, our finding points that the higher participation frequency in local organizations, the less probability of excluding from social welfare payments. The number of organizations existed in community plays an insignificant role in social welfare exclusion of indigenous peoples.

insert table 3 about here

## **Conclusions**

The indigenous peoples are regarded as ethnic minority and vulnerable to external influences, discrimination and marginalization by the majority in Taiwan (Chiu, 2008; Chang, Lin and Liu, 2010). The primary purpose of this study provides empirical

evidences to explore multi-dimensional social exclusion of indigenous peoples. In contrast to previous studies, this analysis is unique in several ways. First, we focus on accessibility to public provided cash benefits for indigenous peoples, rather than broader definition of social exclusion, such as exclusion from material resources, employment, education, medical and health care, or social relationships. Using the term of social welfare exclusion can help us to get better understanding on the connection between indigenous welfare program and disadvantaged situation of indigenous peoples. In addition, we examine the extent to which indigeneity and social participation may have effects on the risk of being excluded from specific social welfare payment, while controlling other exogenous variables.

Using a nationwide survey data in Taiwan, our empirical findings reveal some interesting findings with policy implications. First, the reported findings show that over half of respondents (54.32%) are excluded from two or three kinds of welfare payments. Among different social welfare exclusions, the inaccessibility to medical and health allowance, housing subsidy, and financial aid for emergency are the severest forms of indigenous social exclusion, as defined in this analysis. On the contrary, only less than ten percent of respondents have successfully received social welfare benefits to meet their according needs. This result of multiple exclusion points to the evidence that ignoring the accessibility to social welfare payment may result in misleading indigenous policy inferences. Second, a statistically significant association between indigeneity and multi-dimensional social exclusion is found across different models. Interestingly, both of ethnical and regional indigeneity positively contributes to reduce the risk of being excluded from social welfare benefits. Our results indicate that those respondents are mountain indigenes, lived in indigenous area are less likely to be experiencing exclusion in most dimensions of social welfare benefits, except for the financial exclusion model. While these results may not be very surprising and consistent with prior expectations, they point to the importance of accessing rights to social welfare systems to alleviate indigenous social exclusion problems (Wen et al., 2004; Chiu, 2008; Hsu, 2012). Despite the mountain indigenes tend to live in more deprived highland region, they display higher ethics identities, kinship- and tribe-based lifestyles, and sharing cultural traditions than plain counterparts. Such ethnic indigeneity is likely to affect their inclusion in social welfare system positively. Our results are also consistent with the findings of Hsieh (2013) suggesting that indigenous traditional territory plays an important role to be positively associated with reductions in social exclusion. Similarly, the geographic indigeneity also help indigenous peoples to acquire social payment from most of social welfare programs. Due to the natural constraints and spatial isolation of indigenous area, the remote rural residence and mountainous ethnicity do not have significant contribution to receiving financial aid for economic hardship.

Our findings have significant implications for multidimensionality of social exclusion and indigenous welfare policies. First, from the perspective of policy-makers, the greater levels of social exclusion with indigenous features suggest that existing social welfare programs are still unable to prevent indigenous peoples from becoming socially excluded. Therefore, our findings suggest that indigenous

policy should put more efforts on maintaining and strengthening physically and ethnical indigeneity, which have indirect but positive influence on functioning indigenous welfare programs. Greater investment in resources promoting traditional territory for mountain indigenes not only represents a relatively cost effective way of improving social welfare delivery. It could also have wider benefits in helping to reduce multiple dimensions of social exclusion of indigenous peoples. In particular, many of the arguments for promoting traditional territory, tribal lifestyle and ethnic solidarity made to indigenous peoples in indigenous policy implications.

Second, indigenous policy-makers should regard multi-dimensional exclusion as a priority, our results suggest that further measures should focus on those most excluded domains. The government can encourage the local social agencies and indigenous organizations to develop simplified and transparent administration of social welfare registration for indigenous peoples. Those who has higher level of engaging in community organizational activities can easily obtain and disseminate information of indigenous welfare programs. Considering different welfare programs and single-focus policy administrators have little contact with one another. While not directly related to our study, the government could also transcend bureaucratic barriers by integrate discrete welfare related authorities, such indigenous administration, social affairs, health, education and economic affairs department, and provide one-stop service to help indigenous peoples accessing to social welfare benefits. Consequently, our study will be more robust, if further information about the main reason why the respondents did not apply for or receive social welfare payments is available.

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Table 1. Variable definition and sample distribution (N =2,040)

Variable	Definition	Mean (%)	SD
<i>Dependent Variables (multidimensional social welfare exclusion)</i>			
number_ex	Number of social exclusion dimensions, if the respondent has needs for social welfare benefits but could not receive corresponding payments	2.10	1.13
medical_ex	Medical and health exclusion, if could not receive needed NHI subsidies, medical transportation subsidies medical allowance for indigenes (=1)	0.56	-
housing_ex	Housing exclusion, if could not receive needed subsidies of housing, or interest subsidies for building and repairing house for indigenes (=1)	0.54	-
financial_ex	Financial exclusion, if the respondent encounters economic difficulty and could not receive aid for emergency or needed financial assistance (=1)	0.56	-
education_ex	Educational exclusion, if has any children enrolled in school and not receive child-care and tuition subsidies, scholarships, and other education allowances (=1)	0.30	-
old-age_ex	Old-age exclusion, if the respondent has any family member aged over 55 and could not receive senior welfare living allowances (=1)	0.17	-
<i>Socio-demographic Variables</i>			
male	If the respondent is male (=1)	0.44	-
age	Age of the respondent	42.31	12.39
mount_p	If the respondent is registered as a mountain indigenous person (=1)	0.54	-
primary	If the respondent has a primary school education or lower	0.29	-
junior	If the respondent's education level is junior high school	0.22	-
senior	If the respondent's education level is senior high school	0.33	-
college	If has a college level education or higher	0.15	-
employment	If the respondent currently has a job (=1)	0.64	-
<i>Household features</i>			
married	If the respondent is currently married (=1)	0.62	-
marri_other	If the respondent is divorced or the spouse passed away	0.17	-
single	If the respondent has never been married (=1)	0.21	-
num_household	Number of people in one household	3.41	2.39
inc	Average income per household in one month	4.21	3.19
<i>Community/Regional characteristics</i>			
org_community	Number of community organizations	4.46	8.22
org_partic	Frequency the respondent attends local community organizations or associations	1.00	1.09
indig_area	If the respondent lives in an indigenous area (=1)	0.51	-

Table 2. Comparison of multi-dimensional social exclusion of indigenous peoples (N = 2,040)

	not_excluded N=169		1_dimen_ex N=461		2_dimen_ex N=647		3_dimen_ex N=521		4_dimen_ex N=242		$\chi^2$ / F-value
	mean (%)	sd.	mean (%)	sd.	mean (%)	sd.	mean (%)	sd.	mean (%)	sd.	
male	0.51	0.50	0.44	0.49	0.45	0.50	0.43	0.50	0.36	0.48	10.92**
age	39.42	13.04	42.57	13.24	42.40	12.30	42.40	11.81	43.36	11.53	2.81**
mount_p	0.63	0.48	0.59	0.49	0.56	0.50	0.51	0.50	0.40	0.49	32.85***
primary	0.20	-	0.29	-	0.29	-	0.29	-	0.35	-	47.71***
junior	0.14	-	0.20	-	0.23	-	0.24	-	0.25	-	-
senior	0.38	-	0.32	-	0.33	-	0.34	-	0.31	-	-
college	0.28	-	0.18	-	0.14	-	0.12	-	0.09	-	-
employment	0.68	0.47	0.65	0.48	0.65	0.48	0.64	0.48	0.58	0.49	5.51
married	0.59	-	0.58	-	0.64	-	0.59	-	0.71	-	39.98***
marri_other	0.12	-	0.16	-	0.16	-	0.21	-	0.17	-	-
single	0.30	-	0.27	-	0.20	-	0.20	-	0.11	-	-
num_household	3.18	2.74	3.21	2.51	3.43	2.39	3.43	2.27	3.87	2.08	3.44***
inc	5.32	3.70	4.5	3.56	4.36	3.41	3.69	2.56	3.62	2.28	12.24***
org_community	3.97	7.41	4.16	7.70	4.61	8.27	4.78	8.71	4.31	8.50	0.58
org_partic	1.24	1.14	1.18	1.10	1.04	1.12	0.77	1.02	0.84	1.03	12.76***
indig_area	0.55	0.49	0.57	0.50	0.55	0.50	0.49	0.50	0.35	0.48	37.68***

\*\*\*, \*\*, \* The significance at the 0.1%, 1%, and 5 % level, respectively.

Table 3. Ordered/Binary logistic regression results of indigenous social exclusion (excluded vs. not\_excluded)

Parameter	M <sub>1</sub> : Number_ex <sup>a</sup>			M <sub>2</sub> : Medical_ex			M <sub>3</sub> : Housing_ex			M <sub>4</sub> : Financial_ex			M <sub>5</sub> : Education_ex			M <sub>6</sub> : Old-age_ex		
	$\beta$	Exp( $\beta$ )	S.E.	$\beta$	Exp( $\beta$ )	S.E.	B	Exp( $\beta$ )	S.E.	B	Exp( $\beta$ )	S.E.	$\beta$	Exp( $\beta$ )	S.E.	$\beta$	Exp( $\beta$ )	S.E.
male	-0.03	0.97	0.09	-0.12	0.89	0.10	0.08	1.08	0.10	-0.10	0.90	0.10	-0.02	0.98	0.11	0.04	10.4	0.13
age	-0.00	1.00	0.00	0.02	1.02 <sup>***</sup>	0.01	-0.01	0.99	0.01	0.00	1.00	0.01	-0.02	0.98 <sup>***</sup>	0.01	0.01	1.01	0.01
mount_p	-0.38	0.68 <sup>***</sup>	0.08	-0.22	0.80 <sup>**</sup>	0.09	-0.30	0.74 <sup>**</sup>	0.10	-0.02	0.98	0.10	-0.33	0.72 <sup>***</sup>	0.11	-0.40	0.67 <sup>***</sup>	0.12
primary	0.24	1.27	0.16	0.03	1.03	0.18	0.23	1.26 <sup>***</sup>	0.18	0.43	1.54 <sup>***</sup>	0.18	-0.09	0.91	0.20	0.08	1.08	0.23
junior	0.31	1.36 <sup>*</sup>	0.14	0.10	1.11	0.16	-0.16	0.85	0.16	0.52	1.68 <sup>***</sup>	0.17	0.01	1.01	0.18	0.04	1.04	0.21
senior	0.23	1.26 <sup>*</sup>	0.13	0.21	1.23	0.1	-0.03	0.97	0.15	0.21	1.23	0.15	0.14	1.15	0.26	0.01	1.01	0.19
(ref.=College)																		
employment	-0.05	0.95	0.09	0.00	1.00	0.10	-0.01	0.99	0.10	0.03	1.03	0.11	-0.19	0.83 <sup>*</sup>	0.11	0.01	1.01	0.13
married	0.44	1.55 <sup>***</sup>	0.13	-0.07	0.93	0.14	0.41	1.51 <sup>***</sup>	0.15	0.19	1.21	0.15	1.05	2.86 <sup>***</sup>	0.17	-0.19	0.83	0.19
marri_other	0.47	1.60 <sup>***</sup>	0.16	0.12	1.13 <sup>**</sup>	0.18	0.55	1.73 <sup>***</sup>	0.19	0.20	1.22	0.19	0.59	1.80 <sup>***</sup>	0.22	-0.16	0.85	0.24
(ref.=single)																		
num_household	0.09	1.09 <sup>***</sup>	0.02	0.02	1.02	0.02	0.02	1.02 <sup>***</sup>	0.02	0.03	1.03	0.02	0.15	1.16 <sup>***</sup>	0.02	0.06	1.06 <sup>**</sup>	0.02
inc	-0.11	0.90 <sup>***</sup>	0.01	-0.01	0.99	0.02	-0.08	0.92	0.02	-0.24	0.79 <sup>***</sup>	0.02	-0.01	0.99	0.02	0.01	1.01	0.02
org_community	-0.00	1.00	0.00	0.01	1.01	0.01	0.01	1.01	0.01	-0.01	0.99	0.01	-0.01	0.99	0.01	-0.01	0.99 <sup>*</sup>	0.01
org_partic	-0.22	0.80 <sup>***</sup>	0.04	-0.10	0.90 <sup>**</sup>	0.04	-0.18	0.84	0.04	-0.12	0.89 <sup>***</sup>	0.05	-0.16	0.85 <sup>**</sup>	0.05	-0.04	0.96	0.06
indig_area	-0.44	0.64 <sup>***</sup>	0.09	-0.30	0.74 <sup>***</sup>	0.10	-0.65	0.52 <sup>***</sup>	0.10	0.05	1.05	0.11	-0.24	0.79 <sup>**</sup>	0.11	-0.22	0.80 <sup>*</sup>	0.13
Intercept_1	2.94	18.92 <sup>***</sup>	0.24	-0.17	0.84	0.35	1.39	4.01 <sup>***</sup>	0.26	0.81	2.25 <sup>**</sup>	0.27	-0.65	0.52 <sup>**</sup>	0.28	-1.77	0.17 <sup>***</sup>	0.34
Intercept_2	1.67	5.31 <sup>***</sup>																

Intercept_3	3.09	21.98					***
Intercept_4	4.67	106.70					***
Likelihood Ratio	202.06	50.16	133.61	283.23	167.32	27.00	
Pseudo-R <sup>2</sup>	0.03	0.02	0.05	0.10	0.08	0.02	

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<sup>a</sup> Reference group is not\_excluded samples (Number\_ex=0) ;  $\beta$  (beta value) is regression coefficient; S.E.is standard error; \*\*\*, \*\*, \* indicate the significance at the 0.1%, 1%, and 5 % level, respectively.