# Health and Poverty
# Among Indigenous People in Chile

## Problem Statement

When Columbus discovered the new world he found a land already inhabited by people, the indigenous people of the Americas. The subsequent history of oppression, subjugation and discrimination towards indigenous people has been well documented. Whether in North, Central or South America, native peoples were evicted from their lands and traditional livelihoods, forced to assimilate or forcibly isolated on reservations, and otherwise subjected to the exploitative tendencies of colonizers. Regrettably, this history is not unique to the Americas. Indigenous groups exist around the world, each with their own story of repression and discrimination. According to the United Nations (UN), despite centuries of forced assimilation, there are more than 370 million people in the world today who identify as belonging to an indigenous group. Despite the varying groups, languages, beliefs and cultures, common to many of their histories is a pattern of rural, agrarian populations being dominated forcefully, politically, and economically by a colonizing population (Claudio and Jeanne 2008). And one characteristic that is almost universally shared amongst indigenous people is poverty.

Poverty is not only a concern because of the inherent inequality but because of the negative outcomes that are associated with poverty. Variations in health have been shown to be correlated with income and poverty. Lower income is associated with poorer health outcomes (Adler and Newman 2002; Newacheck, Hung et al. 2003; Shi and Stevens 2005). Health disparities are not equally distributed across racial groups. Multiple research projects in developing countries as well as some lesser developed countries have shown that racial

minorities have higher rates of poverty and poor health (Betancourt, Green et al. 2003; Alexander Warren, Alejandro Esteban et al. 2007; Acevedo-Garcia, Osypuk et al. 2008) .

While worldwide concern gained a voice in the 2007 UN Declaration on the Rights of Indigenous Peoples, much needs to be learned about the socio-economic and health circumstances of indigenous people today if meaningful and effective ameliorative strategies are to be developed (Kaplan and Bennett 2003).

Just as when Columbus arrived in the Americas, Latin America today is home to a diverse indigenous population that numbers over 40 million (Gonzalez 1994; Eversole, McNeish et al. 2005). They inhabit a range of countries and diverse contexts. The indigenous population accounts for about 11% of the population in Latin America (McNeish 2005), a far greater percentage than the 0.8% seen in the United States according to recent U.S. Census Bureau estimates.  Despite their relatively large share of the Latin American population, little is known empirically about how they compare socially and demographically to the non-indigenous population, what mechanisms perpetuate the higher rates of poverty among the indigenous population, and how they confront difficult social and economic challenges as they piece together a living. This research will focus on the relationship between poverty and health among indigenous peoples, specifically in Chile.

## Literature Review

The first people in Chile were the ancestors of the indigenous people of today. The largest group of indigenous people in Chile (at over 75%) is the Mapuche of the Central Valley (MIDEPLAN 2007). At eight percent, the proportion of the Chilean population that is indigenous is low relative to other Latin American countries.  However, at 1.2 million people it is quite

sizable in absolute terms (IADB 2006). According to the Ministry of Planning and Cooperation in Chile, the indigenous population is growing at a rate comparable to the overall population (MIDEPLAN 2007), so it will remain an important minority group into the future.

In the past few decades Chile has experienced profound political and economic transitions going from the leftward leaning leadership of Salvador Allende during the 1970's, to years of brutal dictatorship in the 1980's under Augosto Pinochet, to a series of democratically elected presidencies basically following pro-growth market oriented economic policies (United Nations. Economic Commission for Latin America and the Caribbean. 1988; WorldBank 2002; Rector 2003). These policies have ostensibly met with some success(Ocampo, Franco et al. 2004). Just in the past decade, Chile has been able to significantly decrease the rate of poverty at the national level (Mario 2008). However, this poverty reduction has not been evenly distributed. Rural areas, over represented by indigenous people, have experienced less poverty reduction (WorldBank 2002). This finding is in line with limited research showing that indigenous people in Latin America, despite economic growth, are more likely than non-indigenous people to be poor (Kay 2006).

The history of the indigenous population in Chile has been one of repression, discrimination and subjugation (Melissa, David et al. 2008). When Europeans came into Chile they attempted to keep the indigenous populations isolated in part because they believed them to be inferior(Wiegand 1983). Segregation but also forced assimilation became the twin tools of the dominating European-origin population (Rector 2003; Mallon 2005). The indigenous people were forced to assimilate or faced isolation, and they were subjected to social oppression through legislation, social policies and other official and quasi-official means (Jeffery 2007). These laws created formal mechanisms such as slavery and a reservation system that legally legitimized

discrimination against indigenous people. One example was the forcing of indigenous communities onto reservations that were smaller than traditional ancestral lands (Ray 2007). An inevitable result was dire poverty amongst indigenous people. Over time these official policies of repression became viewed as morally unacceptable, and they slowly changed (Jeffery 2007). Despite abolishment of these formal controls, informal means of oppression such as racism and discrimination still exist. One example is in access to human capital attainment (Ray 2007). Indigenous people in urban areas are given less opportunities for education, adequate employment, housing and health care (Sahn and Younger 2006). Their survival depends on their ability to compete in the urban world and the lack of human capital renders that survival difficult. Indigenous Chileans in rural areas, who are more likely to rely on the land for survival, are faced with decreased access to land, and receive less of the infrastructure benefits of urban areas. The Mapuche are forced to compete in a larger Chilean society, but negative stereotypes and discrimination constrain their ability to participate and compete in mainstream society (Patricia 2007; Ray 2007). Just as has been chronicled in the United States, these disadvantages become barriers to attaining standards of living comparable to the non-indigenous population (Snipp 1989).

A complicating factor in current studies of indigenous people inheres in the reliance on self-identification as indigenous which raises problems of selectivity. Some indigenous people have ceased to identify with indigenous groups, moved away from indigenous areas and assimilated into mainstream Chilean society (Ray 2007). Others still maintain an indigenous identity but have left indigenous lands and migrated to the cities to eke out a living in an urban setting, either in the mainstream or at the margin. Many however have maintained their indigenous identity and continue to seek ways to maintain their lifestyles on their ancestral lands

(Raúl 2008; Wessendorf 2008). As such, poverty among indigenous people in rural areas may be influenced not only by the legacy and practice of formal and informal means of oppression, but also by the selection of people who self-identify as indigenous and choose to remain in rural areas. In other words, much as William J. Wilson describes the inner city with its concentration of the black underclass, rural reservations might be described as rural concentrations of the Mapuche underclass (Wilson 1987).

The identity of the Mapuche is inextricably bound to the land. Indeed, the name Mapuche means "people of the land" (Ray 2007). As in many countries, indigenous people in Chile are far more likely to reside in rural areas than are their non-indigenous counterparts (MIDEPLAN). This interaction of identity with land also complicates the study of poverty among the indigenous people because location and space available to a community can greatly affect the risk of poverty among indigenous and non-indigenous people alike (RSS 1993). Empirical evidence has shown that areas that are dependent on one major natural resource for economic well-being are disproportionately poor (Slack and Jensen 2004; Stedman, Parkins, and Beckley 2004). As well, in rural areas the population is less likely to have adequate housing, health and sanitation. They receive less education and have less access to high paying jobs. They are overly dependent on natural resources for livelihood and employment (Psacharolpulos and Patrinos 1994). This is consistent with other empirical studies of poverty in Latin America (McNeish 2005; Eversole 2005; Damman 2005; Kelley 1988).

Despite being disadvantaged by their rural location, rural people often contribute to their own economic well-being through various informal survival strategies such as gardening, hunting, fishing and bartering (RSS 1993; Gomez and Franco 2007). Poverty measures that do not take into consideration differing costs of living, levels of infrastructure, community

characteristics, or the varying survival strategies of rural populations can over or under state the level of poverty (Snipp 1992; RSS 1993).

Some research has attempted to look at variations in health between indigenous and non indigenous in Chile (Patricia, Hugo et al. 2001; Burrows 2008). Most of these studies only examine a small sample of the population (Sapag, Aracena et al. 2008) or focus on a particular type of illness (Benjamin Vicente, Pedro et al. 2005; Rojas 2007). One particular problem with these studies is the aggregation of indigenous into one group(McArthur, Holbert et al. 2003). This assumes that indigenous people are a homogenous group and masked any variation across indigenous groups. The most cited reason for this aggregation is lack of data. Fortunately the data is available for some analysis of variations within the indigenous population.

Recent changes in health care policy as well as the economy have effected changes in access to health care (Howard, Celia et al. 2001; Burrows 2008) but empirical evidence of improvements in population health are yet to be seen. The increase access may not have been equally improved across space. Urban areas are consistently granted greater access to infrastructural development such as healthcare. For this reason it is important to empirically identify trends in health across groups and region.

The indigenous population of Chile has endured centuries of subjugation and discrimination that has left a lasting legacy manifest most noticeably in high rates of poverty. At the same time, like all Chileans, they have seen significant social and political transformations in recent decades, but for them these macro-level changes have not had uniformly positive implications. Notably, they may have fallen further behind the non-indigenous population that is generally prospering amidst economic growth, and those following more traditional lifestyles in rural central Chile may have had their livelihoods threatened by orthodox growth-oriented

economic development strategies.  Apart from descriptive evidence of higher poverty rates and poorer health among the Mapuche, much is left unknown.  The purpose of this research is to make a contribution towards answering the following general questions:   Are indigenous people in Chile more poor? How does health vary between indigenous and non-indigenous people?  To what extent do disadvantages in human capital (education) and other individual and family-level variables account for disparity in health and poverty?  To what extent do ecological variables such as rurality of residence play?   Together these questions generally ask, what are the relationships between poverty and health among the indigenous people (mostly the Mapuche) in Chile? Researching the social, economic, and health situation of indigenous people not only sheds light on their particular situation, but also broadens the literature on issues such as health, poverty and ethnicity.


**Data**

The data comes from a household survey developed by the Ministry of Planning and Cooperation in Chile called the *National Socio-economic Characterization Survey* or CASEN. This survey is a government funded household survey of about 71,325 (in 2003) households throughout Chile. This survey gathers data about household demographic variables as well as employment, income, education and health issues. It is a stratified cluster sample that is nationally representative.

Because of its large sample size, representativeness, depth of information, and the fact that the data are geo-coded, the CASEN lends itself to quantitative research on health and poverty that includes spatial location.  This survey provides the data necessary to assess the relative impact of many of the mechanisms that may perpetuate poverty and poor health. Using

the CASEN data allows the analysis of household level demographic variables that correlate with indigenous poverty and health such as human capital attainment, family composition, employment, and residence. The survey data are stratified by rural and urban residence, with the entire nation broken down into its three distinct geographic levels: region, province and county.

The ethnic identity is self identified when the respondents are asked if they belong to or identify with one of nine indigenous groups. As mentioned above, most literature chooses to use indigenous as a dichotomous variable. This analysis attempts to keep the groups separated as much as possible. Unfortunately the majority of the indigenous groups in Chile are very small in number. For this reason the ethnicity is divided into three groups: non-indigenous, Mapuche, and other indigenous groups.

The health question is a 5 category scale of self rated health with possible answers consisting of very good, good, regular, bad and very bad. Self-rated health has been shown to be an effective measure of overall health (Reyes-Ortiz, Pelaez et al. 2007; Sapag and Kawachi 2007; Sapag, Aracena et al. 2008). In the case of this survey there were a large portion of respondents who did not respond to this question. In order to keep as many cases as possible a category called 'other' was included in the analysis. Table one shows the percent of how the population, divided by ethnic group, responded to the self rated health question. The question was coded into separate categories with very good and good combined as well as bad and very bad. This resulted in a four category variable: very good/good, normal, bad/very bad and other.

The poverty variable included in the survey was calculated by the Ministry of Planning. It consists of an absolute monetary value which is calculated as living below two times the cost of a basic food basket. This is similar to the way poverty is calculated in the US. The measurement in Chile has one distinct feature. The absolute poverty line varies by residence with rural

residents expected to live with less income. The reasoning for this difference across space is unclear. This measurement proved to be problematic when controlling for residence so to adjust for this problem a relative poverty line was created. The measurement was calculated by taking the median household income for the entire population and dividing it in half. Respondents are coded poor if their household income is below one half of the median household income. In order to not bias the results by location, the relative poverty measure was used.

The other SES variables are fairly straight forward. Employment was included and describes whether the respondent was employed, compared to those unemployed or inactive in the labor market. Education was included as continuous variable representing years of formal education. 12 years is the normal amount of time to graduate from secondary school in Chile.

Civil status in Chile is also difficult. Divorce was illegal in Chile until 2004. Because of this, the rate of cohabiting couples is higher than other places as well as the rate of separation. In order to deal with this 4 separate groups were coded: Single, Cohabiting, Married and Other. Other includes separated from legal union, separated from non-legal union, and widowed.

Age, number of people in the household, sex, and residence were also all included in the descriptive as well as the other analysis.


## Methodology

In order to address the research questions, descriptive analysis were first conducted to see the rates and correlations of the variables followed by multivariate analyses. Because the data is a household survey, heads of households were selected for analysis.[1] The data is weighted by a

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[1] The data is collected by asking the head of household or their spouse about everyone in the household. The health question was not asked to anyone under the age of 15. For this reason adults, specifically heads of households, are used.

weight variable to adjust it so it is nationally representative. Because health and poverty among indigenous groups is the main focus, these variables were analyzed first.

As mentioned above Table 1 shows the proportion of each ethnic group that answered the health question and how they answered. Both poverty measures are shown in table 2. Further descriptives of the independent variables were made and are presented in Table 3.

The multivariate analysis started with a logistic regression with the category bad/very bad being regressed on the independent variables. The indigenous population was divided up into the three categories discussed above. The final model is given in table four as odds ratios. It became apparent that the number of people that responded with bad/very bad health is low. Trying to break that group up into three ethnic identities became problematic due to lack of cases. To adjust for that, the indigenous variable was aggregated into a dichotomous variable like it is done in other research. To improve on the lack of people responding with bad/very bad, multi-nomial logistic regression was used, with normal, and bad/ very bad each compared to good/very good. The group other was included but not presented in the table. These multi-nomial results are presented in table five.

**Results**

As we can see from table one, the rates at which each group reported their health status significantly varied. The indigenous groups had a higher rate of reporting normal than the non-indigenous population. The other indigenous groups have a higher rate of reporting good health as well as bad health. This is possibly due to their lower rate of not reporting.

**Table 1: Health Descriptives Between Ethnic Groups**

| Percents | very good/good | normal | bad/very bad | other |
|---|---|---|---|---|
| Non-Indigenous | 33.5 | 16.6 | 5.1 | 44.8 |
| Mapuche | 30.4 | 23.1 | 5.6 | 40.8 |
| Other Indigenous | 42.4 | 21.2 | 6.1 | 30.3 |
| Chi-square significance test p< .000 | | | | |

Table 2 represents the difference in the poverty rates by different poverty measures. The rates of poverty vary dramatically across ethnic group. The other indigenous group has a lower rate of poverty compared to either the Mapuche or the non-indigenous group. This may be related to the small number of other indigenous households. The non-indigenous households have consistently lower poverty rates than the Mapuche households. The Mapuche have the highest poverty rates out of the three groups.

**Table 2: Poverty Measures by Ethnic Group, Percent Poor**

| | Poor by Survey | Poor by Relative Measure |
|---|---|---|
| Non-Indigenous | 14.8 | 36.1 |
| Mapuche | 25.6 | 46.6 |
| Other Indigenous | 5.1 | 30.6 |
| Chi square test significant at p<.000 | | |

The third table is a list of independent variables with the percentage of the whole sample listed or for those continuous variables, the average. The majority of the sample is non-indigenous. Over half of the household heads are married, 26 percent are female headed and 87 percent live in urban areas. The employment rate is over 70 percent and the average household sized is about 4 people.

The logistic regression was used to see if the indigenous groups had higher odds of reporting bad/very bad health. As shown in table four, after controlling for socio-demographic characteristics and residential characteristics, neither indigenous group varies significantly from the non-indigenous group in their odds of reporting poor health.  This may be in part because of the small number of those who reported bad/very bad health.

| Table 3: Descriptives, Percentages and Means of Variables | |
|---|---|
| **Individual level** | % Total Sample |
| **Demographics** | |
|   Race (Indigenous) | |
|     Non Indigenous | 95.2 |
|     Mapuche | 4.7 |
|     Other Indigenous | 0.1 |
|   Age (Mean for Head of Household) | 49.4 |
|   Female Headed Households | 25.9 |
|   Marital Status | |
|     Married | 58.0 |
|     Cohabiting | 12.9 |
|     Single | 10.0 |
|     Other | 19.1 |
| **Socioeconomic Status** | |
|   Employment | 71.8 |
|   In Poverty (Relative measure) | 36.5 |
|   Education (mean number of years) | 9.7 |
| **Spatial Characteristics** | |
|   Santiago | 30.9 |
|   Rural | 13.0 |
|   Other Urban | 56.1 |
|   Live in a  House | 85.4 |
|   Number of Residents (Mean) | 3.8 |
|   Own their home | 70.3 |

Other findings become apparent in this model. Gender becomes an issue with women significantly more likely to report bad health compared to men.  SES, as expected, is an

important factor in health variation. Poor, unemployed, and less educated people are significantly more likely to report bad/very bad health.

The multi-nomial logistic regressions were used to help identify more specific variations in self-reported health. These results are included in table five.

| Table 4: Logistic regression of Bad/Very Bad Health on Covariates | |
|---|---|
| **Demographics** | |
| Race (non-indigenous ref) | |
| Mapuche | 0.91 |
| Other Indigenous | 1.50 |
| Age | 1.02*** |
| Female | 1.93*** |
| Marital Status (Married ref) | |
| Cohabiting | 0.97 |
| Single | 0.84** |
| Other | 0.92 |
| **Socioeconomic Status** | |
| Unemployed or Inactive | 2.48*** |
| In Poverty (Relative measure) | 1.49*** |
| Years of Education | 0.92*** |
| **Spatial Characteristics** | |
| Santiago (ref) | |
| Rural | 1.07 |
| Other Urban | 1.00 |
| Number of Residents (Mean) | 0.95*** |
| Pseudo $R^2$ | 0.17 |
| -2Log Likelihood | 24279.00 |
| *=p<.05, **=p<.01, ***=p<.001 | |

In the first model, only ethnicity was included. The results show that indigenous people (as an aggregated group) are significantly more likely than non-indigenous people to report bad/very bad than good/very good. This is the same for normal compared to good/very good. After including individual demographic characteristics in the second model the results are the same. In the third model only SES variables are included and the results change. Although still significant

(although the significance has decreased), indigenous people in this model are less likely to report bad health than non-indigenous but more likely to report normal health than non-indigenous people.

In the fourth model only residential characteristics are included. This includes whether they own their own home versus renting, and whether they live in a house versus an apartment or other type of structure. Rural and other urban areas are also compared to residents of Santiago. The results show that residence does seem to make a difference with rural and other urban areas significantly more likely to report poorer health than those in Santiago. In the final model all variables are included. The results show that indigenous people do not differ significantly from the non-indigenous in their odds of reporting bad/very bad health. Gender does however remain a significant difference as well as SES. In regards to reporting normal versus reporting good/very good, indigenous people are significantly more likely to report normal health, suggesting that they have poorer health than non-indigenous people.

Residential characteristics lose significance when comparing bad to good, but when comparing normal to good health residence retains its significant odds. SES of course stays significant in every model.

**<u>Discussion</u>**

There is something about self identifying as an indigenous person in Chile that shows significant difference when compared to non-indigenous people. The likelihood of reporting poorer health differs. If we assume that self-reported health is a valuable and accurate measure of health, then indigenous people are more likely to have poorer health. The assumption that self-reporting health measures are consistently accurate across cultural and ethnic lines is unclear. If

indigenous people have some cultural characteristic that biases their reporting towards the mean or normal health in this case, then the results may not be that accurate.

Alternatively because they have higher poverty rates and have a higher rate of living in rural areas more analysis needs to be done in order to understand the interactions between residence and poverty on health.

One problem that was encountered that is the same as other researchers looking at indigenous issues in Chile is the inability to disaggregate the indigenous groups to look at them separately. In the logistic regression the results show differences between the Mapuche and the other indigenous groups in their odds of having bad health. The other indigenous group is small but by aggregating together the two indigenous groups for the multi-nomial models these differences are hidden, potentially biasing the results.

From the results it would be tempting to conclude that indigenous people have higher odds of reporting poor health, but further types of analysis are needed to understand the potential differences within the indigenous category.

**Table 5: Multi- Nomial Logistic Regressions of Self Rated Health on Socio-economic Covariates**

| Variables[a] | Model I | | Model II | | Model III | | Model IV | | Model V | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bad/ Very Bad | Normal | Bad/ Very Bad | Normal | Bad/ Very Bad | Normal | Bad/ Very Bad | Normal | Bad/ Very Bad | Normal |
| **Individual level** | | | | | | | | | | |
| Demographics | | | | | | | | | | |
| Race (Indigenous) | .198* | .415*** | .086*** | .508*** | -.192* | .110* | .033 | .210*** | -.017 | .170** |
| Age | | | .060*** | .040*** | | | | | .034*** | .023*** |
| Gender (female ref) | | | -.819*** | .560*** | | | | | -.615*** | -.486*** |
| Marital Status (married ref) | | | | | | | | | | |
| Cohabiting | | | .168* | .231*** | | | | | .013 | .136** |
| Single | | | -.270*** | .250*** | | | | | -.181* | -.167*** |
| Other | | | -.195** | .171*** | | | | | -.178** | -.145*** |
| Socioeconomic Status | | | | | | | | | | |
| Employment | | | | | -1.316*** | -.664*** | | | -.688*** | -.263*** |
| Poverty Status | | | | | .239*** | .030 | | | .626*** | .232*** |
| Education | | | | | -.166*** | -.132*** | | | -.123*** | -.095*** |
| **Residential Characteristics** | | | | | | | | | | |
| Rural | | | | | | | .558*** | .827*** | .070 | .450*** |
| Other Urban | | | | | | | .149*** | .344*** | .054 | .286*** |
| Type of House | | | | | | | .310*** | .241*** | -.072 | -.004 |
| Number of Residents | | | | | | | -.091*** | -.019* | .010 | .033*** |
| House Tenure | | | | | | | .744*** | .563*** | .061 | .101*** |
| N= | 71324 | | 71324 | | 71324 | | 71324 | | 71324 | |
| Pseudo R² | .001 | | .214 | | .163 | | .098 | | .287 | |
| -2Log Likelihood | 55 | | 14729 | | 3422 | | 7637 | | 128849 | |

[a] reference category is very good/good health

*=p<.05, **=p<.01, ***=p<.001

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