

# **Life versus Mogen: are the Mapuche people living a different life?**

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## **Abstract:**

This paper investigates one of the main arguments behind the Mapuche violent conflict in the south of Chile. Several authors, as well as the media, point out to poverty and high inequality as the central reason explaining the violent conflict in the region of la Araucanía in Chile. This study provides a poverty analysis and a capability comparative of the Mapuche indigenous group and the rest of the population in this conflict affected region. Using both monetary and multidimensional poverty indicators, based on data from the 2013 National Socio Economic Characterization survey and information from administrative records, the investigation explores some of the most important elements of deprivation and poverty affecting the region with specific emphasis on the differences between the Mapuche and non-Mapuche. As expected, significant differences are found between indigenous and non-indigenous groups, both in terms of poverty status and in the depth of it. Combined with qualitative work, this evidence can shed light on possible explanations for the conflict and thus provide critical information on how to address it. These results could help better designing inclusive policies that tackle the main causes of poverty and lack of capabilities. Innovative policy prescription could help minimize the violence in the region as well as provide with new opportunities to a population lagging behind mostly due to discrimination.

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## I. Introduction

Unlike most of the Latin America, Chile has little racial heterogeneity and far less indigenous population than its neighbor countries (e.g. Peru and Bolivia). The most relevant and prevalent group is the Mapuche people, mostly located in the Araucanía region (south of Chile). During this Spanish conquest, this region became the frontier where the conquistadors could not pass due the Mapuche resistance. Since then, there has been on and off conflict between this indigenous groups and the non-Mapuche population (being the Spanish conquistadors in the XV century or the *colonons* and non-indigenous Chileans today).

The conflict still exists today, violence has reemerged leaving no one indifferent. The recent events have placed the Mapuche conflict in the public eye and the policy agenda. Multiple factors have been identified as causing this conflict, being the extensive deprivations in which the Mapuche people live one of the most frequent ones present in the discussion. Nonetheless, there are no studies that analyze poverty and deprivation focus on the Mapuche people in this region or elsewhere. This paper aims at breaching that gap by analyzing in depth the level of deprivation of the Mapuche and non-Mapuche population in the Araucanía using the multidimensional poverty methodology proposed by Alkire and Foster (2011).

Using data from the Social Protection Scorecard up to the year 2013, the study is able to show empirical evidence of significant differences between both groups in terms of incidence and depth of multidimensional poverty. Multidimensional poverty prevalence in Mapuche households is more than 10 percentage points higher than for non-Mapuche households. This differences driven by the large inequalities of wellbeing present in the rural areas, where a large proportion of Mapuche people live. This evidence could guide the design and implementation of more inclusive policies with the potential to ameliorate what has been called the “Mapuche problem”.

Even though the Mapuche people appear to be more deprive that the non-Mapuche, it is important to be extra careful when interpreting these results. Ethnic and cultural components in this context matter, thus the differences found could be a reflection of those inherent characteristics and cultural choices and not solely a matter of poverty per se. There may be differences in the way the Mapuche conceive a higher state of welfare that from a “western” point of view could be considered to be states of poverty and deprivation.

In an effort to explore the way in which the Mapuche people participate with the rest of the Chilean society, and measure some potential cultural, social characteristics the paper also proposes different ways to capture poverty and deprivation by taking into account some cultural elements that differ

between the Mapuche and non-Mapuche population. If the Mapuche people are living a different life and experiencing higher levels of deprivation, government policy should target this population and tailor made policies to help them develop further their capabilities to live the life they choose.

Even though during the last decade the government, through the National Corporation for Indigenous Development (CONADI), has attempt to address some of these issues by buying and transferring land to indigenous communities, the precarious state in which the Mapuche live remains almost unchanged, evidencing the need for a more comprehensive and integrated approach to solving this problem. In order to provide these comprehensive and multidimensional solutions its paramount to have an accurate diagnostic. The purpose of this paper is filling that knowledge gap and inform policymakers about the unknown life the Mapuche people live in.

The next section will provide a short historic perspective of the Mapuche people and its relationship with the State, section three presents what is known about indigenous poverty in Chile, section four presents the data and methodology, section five presents the results and the final section concludes presenting some policy implications.

## II. A brief history of the Mapuche people

The “indigenous” denomination appears in history as a relative concept, it relates to an “other”, one that is different in terms of culture and values. Thus, several indigenous social conflicts have to do with that “other”, the State, which represents the hegemonic and dominant culture.

In the case of Chile, the conflict between the western culture, represented by the Chilean State, and indigenous groups is clear (Fanon, 1963). There are clear cultural and worldview differences that have not been reconciled until today. Since the beginning of this relationship governments have design an implemented several public policies to build peace in the region.

By the end of the XIX, after a military occupation of the Araucanía –territory until then dominated by the Mapuche, the government incorporate their lands into the national territory, developing a new stage of coexistence between the Chilean State and the Mapuche people. Their communities were relocated to different territories and household heads were given land titles (*Títulos de Merced*) of about 500,000 hectares (Correa et al, 2005). The rest of their territory was auctioned out to agricultural companies as well as to Chilean and foreign settlers. These “reductions” meant a significant decrease of the land available to the Mapuche people, bringing along a series of economic consequences, pushing them out their main traditional economic activities (Bengoa and Valenzuela, 1984). Poverty within these villages increased significantly due to the limited hunter-gatherer activities (Mallon, 2004), giving way to a sedentary subsistence way of life in territories that were often not appropriate for the types of agriculture that until then the Mapuche people were used to.

This process triggered a violent transformation of the political and economic structure within the Mapuche society. The territorial fragmentation made it impossible to preserve their prevailing social organization forcing them to transform the methods of subsistence and pushing them to adopt the peasant system. The geographical distribution change also meant an abrupt alteration of their communication systems leading to a significant loss of important cultural elements (Montalba and Carrasco, 2005, Pacheco, 2011).

Later on, the import substitution industrialization model adopted during the mid 20<sup>th</sup> century, produced important migrations waves from rural sectors to urban areas, process of which the Mapuche were also part of, as means to access new sources of income. At that time, and until years after the agrarian reform, the Mapuche were recognized simply as a rural worker that losing completely their cultural identity when migrating to urban areas. This process was seen as an assimilation of a new identity, linked to a specific socioeconomic class (Aravena, 2001). No cultural differences are recognized between migrants, Mapuche and peasants are considered the same both seen as lower class.

The establishment of the neoliberal economic system in the 1980s increased the level of market participation of the Mapuche people. The Mapuche were allocated individual land titles as a way to lower the transaction costs and ease the land trade. This process delivered little in terms of income generation and higher wellbeing levels (Bengoa and Valenzuela, 1984). Furthermore, this new individual land titles generated significant conflicts within the communities themselves, making it difficult to sustain their ancient solidarity systems (Bengoa, 2007). The separation of the communities not only resulted in economic damages, but also in the emergence of an antagonistic feeling towards the Chilean people (seen as others by the Mapuche). Until this moment in history, there was no real concern regarding the well-being of the ethnic minorities and the importance of including them into the Chilean society. Since the end of the nineteenth century, the relationship with these communities was unstable, constant change brought high levels of social vulnerability among Mapuche households, a fact that was not addressed by government policies.

The antagonistic relationship between the Mapuche and the military regime promoted a natural political alliance between them and the opposition, leading to several policy proposals aimed at improving the life of ethnic minorities in the Patricio Aylwin's government program. After the opposition won the election in 1989 and Chile returned to democracy in 1990, the Special Commission of Indigenous Peoples (CEPI) was created and the first National Congress of Indigenous Peoples gathered to formulate several legislative initiatives sought to increase the protection of the Mapuche lands (e.g. the Indigenous law approved in 1993). The indigenous law established the institutional framework guiding the relationship between the Mapuche and the State, materialized in the creation of the National Corporation for Indigenous Development (CONADI). However, to date there has been

little effectiveness in terms of inclusion and representation in the policymaking process. This lack of participation is reflected in the increasing conflicts with forest companies as well as the problems emerging from several infrastructure projects carried out in Mapuche territories disregarding the provisions of the Indigenous Law (Aylwin, 2000).

Furthermore, the forest promotion Law Decree 701 (1998), has become one of the most conflictive policies in Mapuche land which. This economic promotion law, enacted by President Ricardo Lagos, subsidizes up to 90% of the initial investment costs associated with forest industry and eliminates forestry companies' taxes. Thus, providing great oligopolistic power in the land market to forestry companies, in detriment of Mapuche communities. At the same time, during the 1990's, several international organizations began to pay attention to indigenous issues, the most recognized initiatives being ILO's Convention No. 169. This initiative aimed at recognizing internationally the indigenous right to self-determination. This agreement was officially ratified by Chilean in 2008. In spite of this late ratification, the Mapuche demands began to evolve alongside these international initiatives, aiming at gaining recognition and autonomy as well as to return to their ancestral territories. Some considered these aspirations as "radicals". It has been argued that Mapuche organized further in response to the increased international visibility and due the failure of CONADI as a valid and effective institution (Aylwin, 2000).

Several other inclusion policies have fail due to negative externalities affecting the Mapuche. For example, the formal education expansion aiming at human capital accumulation and development, has bypassed the preservation of the Mapuche worldview as a means of preserving its culture (Parraguez, 2015). At the same time, a process of discrimination within the Mapuche started to take place as more Mapuche individuals interacted with western institutions, this assimilation was viewed as a cultural betrayal. From this phenomenon emerged the term "modern Mapuche", the one who interacts with western institutions, such as hospitals and educational centers. This denomination has been used to argue against targeted policies to the indigenous population, suggesting that since they are integrated to social services, there is no need for special treatment.

Today, the "Mapuche issue" continues to be understood, and treated under the Indigenous Law, as a problem of ethnic minorities, thus shaping from this perspective the way the government designs and implements policies for indigenous peoples (Vergara and Foerster, 2002). Therefore and in spite of the government attempts to ensure indigenous rights, integration has been carried out in an asymmetric way, where Mapuche culture is seen as subordinate to Chilean western culture. It is for this reason that the process of integration has been to a greater extent one of subjugation over one of recognition (Parraguez, 2015).

### III. Indigenous poverty

In Latin America and the Caribbean region, there is a large proportion of the indigenous population, some countries have more than 30% of their population belonging to indigenous groups (e.g. Bolivia, Peru and Ecuador). These countries are also characterized by high levels of poverty (Psacharopoulos, 1994). The situation in Chile, however, must be analyzed from a differently given the comparatively small indigenous population, shaping differently the way this minority groups deal with the government in terms of their social demands (Webber, 2007; Postero and Zamosc, 2004). Nonetheless, the correlation between indigenous origin and poverty status is evident in most countries, going as far as to argue that existing conflicts between indigenous minorities and the government is nothing more than an analogy of an economic class struggle (Webber, 2007).

Indigenous poverty in Chile, although an evident problem, has been barely studied in an empirical way. Most research done is based on case studies that, although they are illustrative, do not provide a clear picture and lack of external validity (González -Parra and Simón, 2008, Peña-Cortés and Pincheira-Ulbrich, 2010, Vergara and Barton, 2013). The few studies available show striking results, evidencing that indigenous people live in deep poverty and at great disadvantage compared to the non-indigenous population.

In an attempt to unpack the indigenous reality in Chile, The World Bank (2002), analyzed the 1996 socio economic characterization survey (CASEN), showing that indigenous families on average have half the income of non-indigenous households. Moreover, one third of the indigenous population worked as unskilled labor.

Based on the CASEN data, the Ministry of Social Development, publishes regular reports analyzing the poverty situation in Chile, touching on indigenous poverty. The most recent report, based on 2015 survey data, shows that 18,3% of indigenous people live in income poverty while only 11% of non-indigenous are identified as income poor. Results from previous years show that both indicators have followed a downward trend, as well as the gap between the two groups has narrowed, however indigenous people are always disproportionately affected by poverty in Chile. The same is found when the unit of analysis is the household or when poverty is estimated under a multidimensional indicator.

Although the Ministry analysis is consistent with the general perception, due to data limitations these results are not reliable. The sample design of the CASEN survey does not allow statistical inference at that level of disaggregation (the data is not stratified to capture representatively ethnic minorities).

The first in depth national study on this matter is Valenzuela (2003). Using data from the 1996 and 2000 CASEN, Valenzuela provides a socioeconomic characterization of indigenous peoples and compares their living standards with the non-indigenous. The study shows that Mapuche individuals

were the most affected by poverty, reaching a 38.4% poverty rate ,15.7 percentage points higher than non-indigenous population poverty rate in 1996, while in 2000 these figures reached 32.9% and 20.1%, respectively. Additionally, indigenous poverty is higher in rural areas, with an incidence of 36.1% compared to 30% in urban areas in 2000. In terms of socioeconomic characteristics, the study finds large gaps in household income, education levels and health status all in favor of the non-indigenous population.

As a way to overcome the CASEN data limitations Agostini and Brown (2010) use a combination of 2002 Census data and the 2003 CASEN to estimate indigenous poverty in Chile. By imputing income from Census data they are able to solve the representation problem of the CASEN and perform statistical inference in an robust manner. Using poverty mapping methodology they are able to disaggregate welfare indicators and estimate accurately income poverty for the indigenous population. They find that indigenous people are on average poorer than non-indigenous people in rural, urban, and the capital city, Santiago. Mapuche together with the Aymara are the two ethnicities most affected by income deprivation. In addition, they find that poverty is greater not only in terms of incidence, but also in its depth. They argue that belonging to indigenous groups should be considered as a possible variable to better target poverty reduction programs.

Bronfman (2014) studies multidimensional poverty in Chile using the 2011 CASEN data. When disaggregating multidimensional poverty by region, the author notices that the ninth region (Region of La Araucanía) is the one with the highest incidence of poverty. Thus, in an attempt to better understand this situation and knowing that the ninth region is home of a large Mapuche community (around 35% of the regional population) the study, compares multidimensional poverty incidence and composition between the Mapuche and non-Mapuche population in La Araucanía. The results show a significantly higher incidence of multidimensional poverty in the Mapuche population, (a head count ratio of 39%, 22 percentage points more than the estimated poverty rate for non-Mapuche). The multidimensional poverty difference between these two groups is much higher than the one estimated when measuring income poverty (where differences are close to 3 percentage points). As for the dimensions analyzed in the multidimensional measure, the greatest gaps are found in terms of income, schooling and access basic services in households, no significant differences found in health. However, this study also fails to account for the data limitations and thus the results are not robust in statistical terms.

#### IV. Data and Methodology

##### The Social Protection Scorecard

The Social Protection Scorecard (FPS) is the main targeting instrument used by the government to assign social benefits. In practice the FPS is a socio economic questionnaire, asked to each individual in the household (or a qualified Informant in the family that provides the information about all household members). The questionnaire has seven modules (location, family information, health, education, occupational status, income and housing). The information is not collected on every household in each municipality, in order to get the FPS, each family has to request it to then access social benefits.

This research used the information from the 2013 FPS accumulated data in the ninth region (La Araucanía). The data set has 790,918 individuals, which covers between 74% and 90% of the population in that region.<sup>2</sup>

Given the self-selection issues and the potential problems related to the recollection dates of the FPS data, it is important to check whether the data is reliable and represents accurately the living and socio economic characteristics of the people in that region. As a way to ensure data reliability and representativeness several checks were made. Since CASEN is regionally representative it can be used as a valid framework for comparison in terms of averages. According to this comparative analysis data from the FPS is reliable and serves well to our research purposes.

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<sup>2</sup> Calculation based on total population reported in the 2002 Census, adjusted by population growth projections from "Compendio Estadístico Regional 2013" INE (2013).

## Descriptive Statistics

Based on the FPS data a simple comparison of different variables between the Mapuche and non-Mapuche households reveals great differences in their living standards. Most of the Mapuche live in rural areas, traditionally associated with higher levels of poverty (of the total rural population, almost 70% is identified as Mapuche). In addition, there are large differences between the urban and rural population, where the latter is at a disadvantage in each of the variables studied.

In terms of education the data shows wide differences between Mapuche and non-Mapuch both in terms of educational attainment and in school attendance. There is a higher percentage of Mapuche children who do not attend any educational establishment when compared to the non-Mapuche children (the largest difference is found for children age 8 to 13). Similarly, the average years of education achieved by the non-Mapuche population is 1.6 years higher than the average for the Mapuche. The health indicators show similar differences, the Mapuche experience greater access difficulties and live farther from health services. It takes them about 10 minutes longer than non-Mapuche households to reach the nearest health post, 30% more time than the non-Mapuche. These differences reflect the lower human capital development the Mapuceh are able to attain given the circumstances they face.

Furthermore, there are important differences in terms of labor participation and employment characteristics, more than 40% of the working Mapuche are independent workers, which is associated with lower labor stability, limited access to social security and a greater exposure to idiosyncratic shocks. In addition to this, there is a high proportion of Mapuche working in agriculture, hunting and forestry activities, all risky activities exposed to climate shocks. All of these results in a situation of high vulnerability, where the chances of experiencing income generation difficulties are significant. On the other hand the non-Mapuche population mostly work as employees in less risky industries.

In terms of their dwelling conditions, the main differences found have to do with access to proper sanitation. Access to drinking water and safe human waste disposal systems is significantly lower in Mapuche houses. This could have severe health implications, increasing exposure to diseases and thus hindering their capacity to study and or work.

The descriptive statistics shed light of the differences between Mapuche and non-Mapuche in various dimensions related to opportunities and quality of life. The descriptive presented illustrate the general situation of the Mapuche and non-Mapuche populations by analyzing different factors separately, not allowing to observe joint deprivation (households experiencing precariousness in more than one indicator at a time). Thus, the following section presents a multidimensional poverty measurement, which helps understand wellbeing in a more comprehensive way. The importance of this analysis lies

on the identification of households suffering deprivation in multiple indicators or dimensions and thus capturing the multifaceted poverty concept. The *multidimensionally poor* are considered to be facing a more complex poverty situation than those presenting problems in only dimension (e.g. income poverty).

Methodology

In order to carry out a stronger, and more illustrative, comparative analysis between the Mapuche and non-Mapuche, we turn to a multidimensional measure of poverty to understand prevalence and depth of poverty.

This type of analysis is motivated by the possibilities that the multidimensional poverty measure provide (i.e. capturing wellbeing beyond income measures, and learn about the joint distribution of different deprivations). This approach allows for better understanding of several different deficits that determine household poverty, thus allowing a better target of public policies.

In order to capture multiple dimension (*d*) of poverty we use the methodology developed by Alkire and Foster (2011), which considers two cutoffs to identify multidimensional poverty status. First, a threshold (or poverty line *Z*) is set for each indicator or dimension in the measure. If an individual or household does not reach the set threshold, it will be considered deprived in that dimension or indicator. The second cutoff determines whether the household is identified as multidimensionally poor (MP) or not, it is determined by the percentage or number of weighted indicators in which a household must be deprived to be considered MP. This second threshold shall be called *K*. The identification follows Bourguignon and Chakravarty (2003) on which the method of Alkire and Foster is based on.

$$P_k(y_i;Z), \text{ where } P_k(y_i;Z) \begin{cases} = 1 \text{ if } c_i(y_i;Z) \geq k, \text{ and} \\ = 0 \text{ if not} \end{cases}$$

*P* is the multidimensional poverty indicator (proposed by Bourguignon and Cahravarty), *y* is an *n*×*d* matrix of deprivations, where each cell indicates the result of the individual *i* = 1,2, ...,*n* in the dimension *d*<sub>*j*</sub> = 1,2, ...,*d*. This procedure allows to identify the total deprivations of each individual as well as the total number of deprive individuals in each dimension.

For each matrix *y*, *g*<sup>0</sup> denotes the deprivation matrix, composed of zeros and ones, depending on whether the individual individuals reaches or not each indicator's poverty line, then from *c*<sub>*i*</sub> = *g*<sup>0</sup><sub>*i*</sub> vectors we obtain the number of deprivations perceived by individual *i* (censored matrix).

In addition,  $g^1$  is defined as the matrix of normalized gaps, where cells  $g^1_{ij} = g^0_{ij} (z_j - y_{ij}) / z_j$  indicates the deprivation depth individual  $i$  experiences in dimension  $j$  (given  $K$ ).

$$g^1(k)_{ij} \begin{cases} (z_j - y_{ij}) / z_j \text{ each time } y_{ij} > z_j \text{ and } P_k(y_i; z) = 1 \\ g^1(k)_{ij} = 0 \text{ if the previous conditions do not hold true} \end{cases}$$

Once these measurements are computed, we can estimate three different indicators. The first one is known as the Headcount Ratio and is defined  $H = q / n$ , and constitutes the multidimensional poverty rate, that is, the number of households that are identified as multidimensionally poor ( $q$ ) over the total of the sample ( $n$ ), showing the incidence of poverty.

Secondly, the indicator  $A = \sum_{i=1}^n C_i(k) / q$ , which represents the intensity of poverty, that is, on how many weighted indicators a household is deprived on average (within those previously identified as MP). Finally, the combination of the above-mentioned indicators given generates  $M_0 = H \times A$ , which shows the poverty rate adjusted for the depth of those identified as MP.

As for the MPI specification and the dimensions chosen for this study, we propose two alternatives. Initially, we adopt as close as possible (given our data availability) the original MPI developed by Alkire and Santos (2010) and the Ministry of Social Development. Since the focus of this research is on Mapuche households, a second specification with different poverty lines is set to reflect better some cultural factors that characterize the Mapuche. This way, it we can observed whether poverty differences between both groups can be explained by cultural or they persist independently of the different conceptions of well-being that they each hold.

Table 1: MPI specification

Dimension	Indicator	Indicator weight	Dimension weight
Education	Years of schooling	0,125	0,25
	School attendance	0,125	
Labor and Social Security	Occupation	0,125	0,25
	Social security	0,125	
Dwelling	Overcrowding	0,05	0,25
	Water	0,05	
	WC	0,05	
	Dirt floor	0,05	
	Dwelling quality	0,05	
Health	Access to health centers	0,083	0,25
	Drug consumption	0,083	
	Permanent health conditions	0,083	

## V. Results

Following the above methodology, multidimensional poverty can be analyzed through several lenses. Thus, we present results found at different levels of aggregation and with respect to different indicators. These results include those obtained under both specifications. Given that the second specification will only change the estimations for the rural Mapuche households, two results are shown for the Mapuche (one for each MPI specification).

First, we analyze the deprivation results for each indicator, showing the percentage of households that are below the poverty line in each them. This analysis considers all households in the sample, that is, prior to censoring the data using the second cutoff  $K$ , which identifies households as multidimensionally poor. These results provide a first view into deprivation levels based on the FPS data in the Araucania region.

Table 2: Level of deprivation by indicator

Dimension	Indicator	Non-Mapuche	Mapuche (a)	Non-Mapuche rural area	Mapuche (b) rural area
Education	Years of schooling	44.5%	60.6%	60.1%	74.1%
	School attendance	4.5%	7.4%	6.1%	9.3%
Labor and Social Security	Occupation	70.1%	73.5%	77.7%	80.7%
	Social security	51.7%	63.9%	65.2%	74.2%
Dwelling	Overcrowding	13.2%	20.8%	13.5%	20.8%
	Water	10.7%	36.6%	37.9%	2.2%
	WC	12.0%	46.3%	51.1%	80.4%
	Dirt floor	1.2%	1.8%	1.9%	0.0%
	Dwelling quality	5.7%	10.1%	6.0%	10.6%
Health	Access to health centers	15.3%	33.6%	45.3%	53.6%
	Drug consumption	1.3%	1.6%	0.9%	1.6%
	Permanent health conditions	29.1%	25.7%	32.6%	28.7%

Table 2 shows that Mapuche households have a higher percentage of deprivation in most of the indicators, which illustrates the worse off situation they face. Indicators of schooling, occupation and social security show high rates of deprivation in both groups, however, for Mapuche households, they surpass 60%, which reflects a situation of great limitations on human capital, inclusion and access to safeguards. Similarly, Mapuche households have high levels of deprivation in the dwelling dimension, specifically access to clean water and W.C., deprivation levels that barely exceed 10% among non-Mapuche households. The only indicator where the deprivation for non-Mapuche households is higher, has to do with permanent health condition, which could account for a higher prevalence of this type of problems among these individuals.

The results under the second specification (valid for rural areas) show some interesting results worth mentioning. As expected, the percentage of deprivations among the Mapuche declined significantly in the indicators where we change the poverty lines (now, non-Mapuche in rural areas appear to be more deprived in these indicators).

Following the methodology proposed by Alkire and Foster (2011), we estimate the multidimensional poverty level and depth for both the Mapuche and non-Mapuche population. As presented earlier, each dimension is equally weighted and each indicators within dimension is weighted the same.

Initial results are presented for different cutoff points  $K$ , and the rest of the analysis is based on a  $K=33\%$  (the most widely used cutoff, see: Alkire and Santos, 2010; Gallo and Roche, 2011, Lopez-Calva and Ortiz-Juárez, 2009, Angulo and Diaz, 2015, Bronfman, 2014). Similarly, sensitivity

studies have shown that using a  $K$  between 1/5 and 2/5 helps maintains comparison across poverty rates (UNDP, 2015).

Table 3. Multidimensional poverty in La Araucania

Cutoff	H			A			M <sub>0</sub>		
K	No Mapuche	Mapuche (a)	Mapuche (b)	No Mapuche	Mapuche (a)	Mapuche (b)	No Mapuche	Mapuche (a)	Mapuche (b)
10	0,92	0,95	0,95	0,29	0,38	0,37	0,27	0,36	0,35
20	0,69	0,82	0,81	0,35	0,42	0,41	0,24	0,35	0,33
30	0,44	0,66	0,64	0,41	0,47	0,45	0,18	0,31	0,29
40	0,19	0,45	0,39	0,49	0,53	0,51	0,09	0,23	0,20
50	0,07	0,26	0,23	0,56	0,58	0,56	0,04	0,15	0,13
60	0,03	0,09	0,04	0,65	0,66	0,65	0,01	0,06	0,03
70	0,001	0,01	0,01	0,75	0,75	0,74	0,01	0,01	0,01
33	0,39	0,60	0,58	0,42	0,48	0,47	0,17	0,29	0,27

The estimations above show important differences between both groups. Under  $K=33$  the difference between Mapuche and non-Mapuche multidimensional poverty rate is 22 percentage points, with a difference of 6 percentage points in the average depth of poverty. This difference is significant at 99% confidence level. The results showing an evident situation of wellbeing inequality between the indigenous and the non-indigenous people in the ninth region. More Mapuche are poor and they are poorer on average.

The results under the second specification, (that takes into account some Mapuche cultural into the index) show that multidimensional poverty for Mapuche falls by 4 percentage points. This means that 4% of Mapuche households were considered to be multidimensionally poor under the parameters of the initial specification, but they ceased to be when using a more adequate set of poverty lines specific for them. However, the change in overall poverty rate is a relatively small. This indicates that many of the households that are no longer considered deprive in terms of the indicators changed continue to have sufficient other deprivations to still be identified as MP.

When disaggregating the estimations by geographical areas (urban-rural), we see that the poverty rate in urban areas reaches 34%, a rate significantly lower than the aggregate estimate of 47%. The percentage of average deprivation remains close to 40%, but the gap between Mapuche and non-Mapuche is reduced to less than one percentage point. This indicates the importance of rural households in the the multidimensional poverty measure.

Table 4. Urban multidimensional poverty

Cutoff K	H		A		M <sub>0</sub>	
	Mapuche	Non-Mapuche	Mapuche	Non-Mapuche	Mapuche	Non-Mapuche
10	0,90	0,90	0,28	0,28	0,26	0,25
20	0,66	0,66	0,34	0,33	0,22	0,22
30	0,41	0,38	0,39	0,39	0,16	0,15
40	0,16	0,14	0,48	0,47	0,08	0,02
50	0,05	0,04	0,55	0,55	0,03	0,07
60	0,01	0,00	0,65	0,64	0,01	0,00
70	0,00	0,00	0,73	0,74	0,00	0,00
33	0,35	0,34	0,41	0,40	0,15	0,14

When comparing the Mapuche and non-Mapuche population in urban areas the wellbeing gap disappears. These results suggest, as in the descriptive statistics, that Mapuche households living in urban live in similar conditions than the rest of the population.

Table 5, shows the estimations for rural households, as mentioned earlier two different specifications of the MPI were estimated in rural areas. In line with the literature on poverty, the results of this study show that poverty is much more prevalent in rural areas, a fact confirmed when using a multidimensional measure. Our results show a high level of multidimensional poverty in rural areas, reaching 76% of households (under  $K=33$ ). The average depth of poverty reaches almost 50%, that is, poor households having almost half of the weighted indicators under their corresponding poverty lines, evidencing the precarious situation of rural households.

Table 5. Rural multidimensional poverty

Cutoff K	H			A			M <sub>0</sub>		
	No Mapuche	Mapuche (a)	Mapuche (b)	No Mapuche	Mapuche (a)	Mapuche (b)	No Mapuche	Mapuche (a)	Mapuche (b)
10	0,98	0,99	0,99	0,39	0,46	0,43	0,38	0,4556	0,4243
20	0,88	0,95	0,93	0,42	0,47	0,45	0,37	0,4495	0,4155
30	0,72	0,87	0,84	0,46	0,49	0,47	0,33	0,4302	0,3929
40	0,47	0,68	0,59	0,52	0,54	0,52	0,24	0,3658	0,3086
50	0,26	0,44	0,38	0,57	0,59	0,56	0,15	0,2543	0,2127
60	0,07	0,16	0,07	0,66	0,66	0,66	0,04	0,1057	0,0457
70	0,01	0,03	0,01	0,75	0,75	0,74	0,01	0,02	0,0076
33	0,66	0,81	0,77	0,47	0,51	0,48	0,31	0,41	0,3709

In line with the above, rural areas show great difference between the Mapuche and non-Mapuche households. The estimated poverty rate for the mapuche is higher than the non-Mapuche under all  $K$ . Although poverty depth remains relatively constant and similar between the two groups, the poverty rate of Mapuche households reaches 81.3% for  $K = 33%$ , exceeding by 16 percentage points the rate of non-Mapuche poverty at that same  $K$ , indicating that there are significant differences in the wellbeing of these groups.

The results of the “culturally sensitive MPI” specification show a smaller wellbeing gap, decreasing the poverty headcount difference from 16 to 11 percentage point. However, the differences remain high and statistically significant, and very relevant in terms of population. These results show a clear inequality situation taking place in La Araucania.

Figure 1. Censored deprivations (under  $K=33$ )

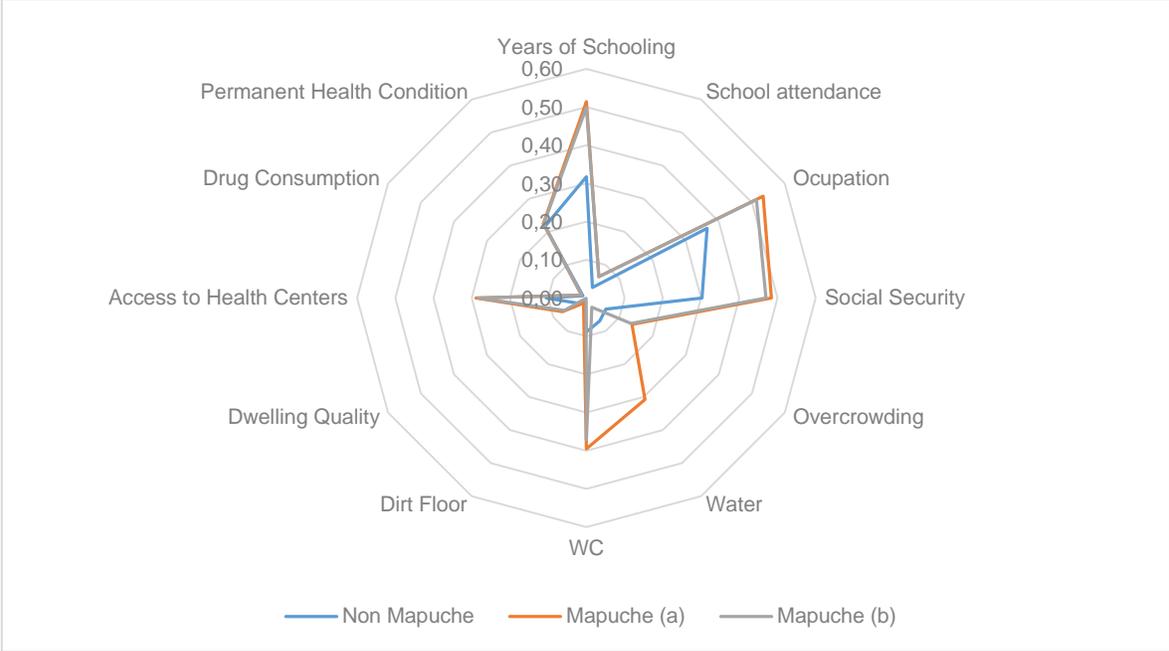


Figure 1 illustrates the important differences in deprivation levels for each indicator. Within the identified as multidimensionally poor, Mapuche households show higher levels of deprivation in almost all indicators. In both groups, schooling, work and social security are the dimensions with the highest percentage of deprivation. However, within Mapuche households indicators such as access to water and sanitation system also constitute present high levels of deprivation, with levels of deprivation above 25%, indicating that for this group, poverty is not only by lack of employment, but also by lower living standards and access to minimum services. Regarding health indicators, it is

observed that the deprivation of poor Mapuche households exceeds 20% in both access indicators and health condition. The latter is also high in the case of non-Mapuche households, reaching almost 22%. The results for the Mapuche have very small changes under the second MPI specification, so it is possible to claim that independent of the cultural factors included in the measurement, households identified as multidimensionally poor have similar characteristics in the variables that are have not been modified.

Figures 2 and 3 show the previous analysis disaggregated by urban and rural areas. As expected, deprivation in urban areas appear to be quite similar for Mapuche and non-Mapuche. However, great differences in the level of deprivation in rural areas are observed under both MPI specifications. Deprivation rates of Mapuche households exceed the non-Mapuche in each of the indicators included.

Figure 2. Censored deprivations (Urban areas under  $K=33$ )

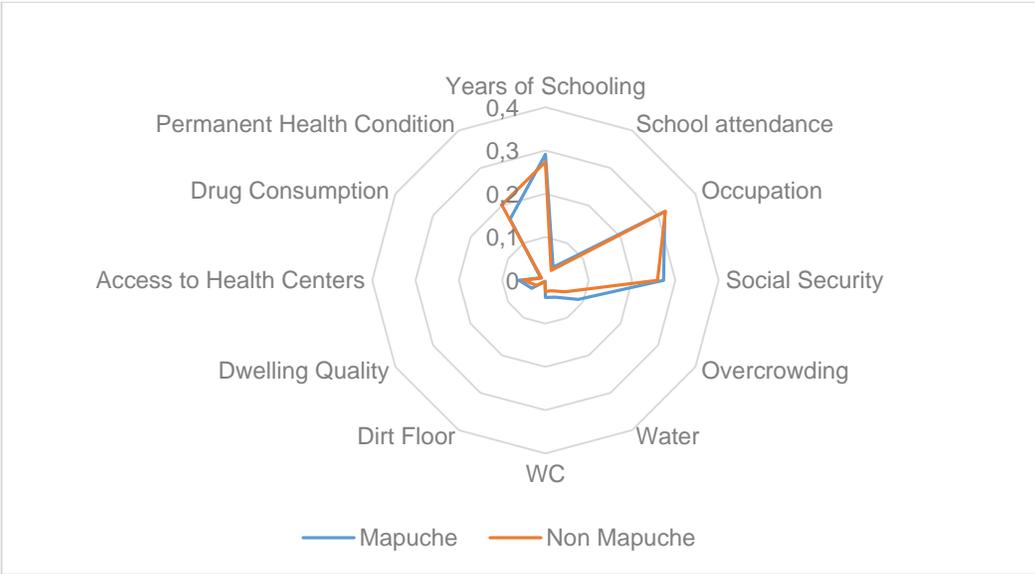
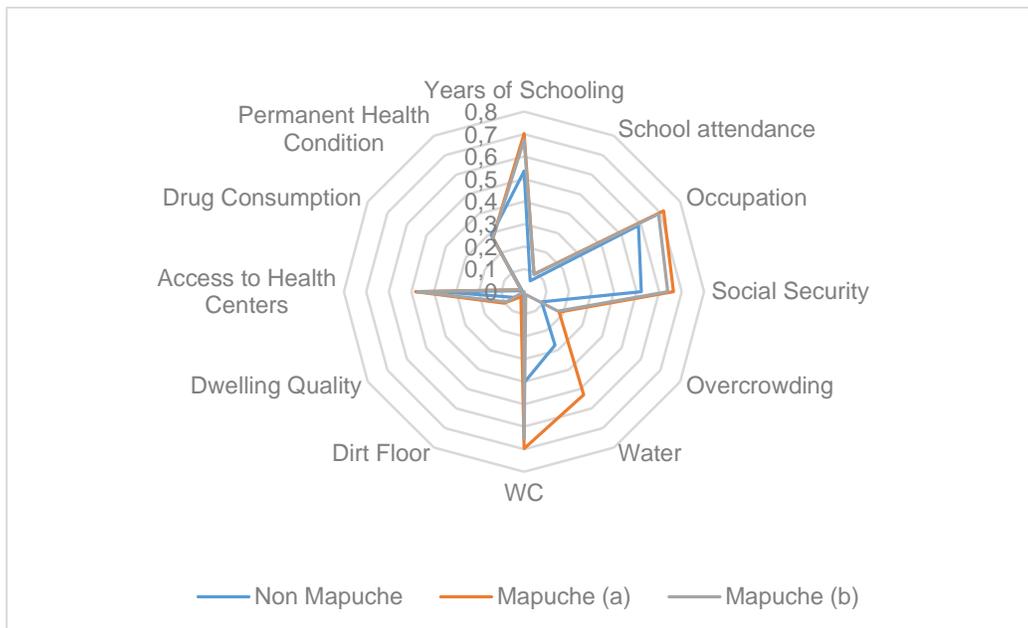


Figure 3. Censored deprivations (Rural areas under  $K=33$ )



In rural areas, indicators such as years of schooling, social security, access to water and sewage show differences greater than 15 percentage points, evidencing an unequal living standard situation across factors. Also is worth noting that regardless the specification used the results for the Mapuche are quite similar. Meaning that the initial poverty results are sustained even after changing some poverty lines to account for cultural differences.

These results are evidence that Mapuche households are consistently poorer than non-Mapuche households, particularly in rural area. It is also important to highlight the fact that both groups present high levels of deprivation in education and labor related indicators. Additional to these common deprivations, Mapuche experience important deprivations in terms of their dwelling characteristics which without a doubt place them under an acute multidimensional poverty state.

To complement the previous analysis, we look into the incidence of each dimension in the adjusted multidimensional poverty index. Table 6 shows the relative contribution of the different dimensions to the adjusted poverty measure for both the Mapuche and the non-Mapuche.

Table 6. Relative contributions to poverty

La Araucania			
Dimension	Non-Mapuche	Mapuche (a)	Mapuche (b)
Education	0.26	0.25	0.26
Labor	0.49	0.44	0.46
Dwelling	0.08	0.16	0.11
Health	0.17	0.15	0.16
Urban areas			
Dimension	Non-Mapuche	Mapuche (a)	Mapuche (b)
Education	0.27	0.28	
Labor	0.52	0.51	
Dwelling	0.05	0.07	
Health	0.16	0.14	
Rural areas			
Dimension	Non-Mapuche	Mapuche (a)	Mapuche (b)
Education	0.24	0.24	0.26
Labor	0.45	0.42	0.45
Dwelling	0.14	0.19	0.13
Health	0.18	0.16	0.17

At regional level (urban and rural) for both Mapuche and non-Mapuche households, the dimensions that contribute the most to  $M_0$  are education and employment status. Being labor deprivations the highest relative contributor. For Mapuche families their dwelling characteristics or “living standards” contribute more to their multidimensional poverty that for the non-Mapuche. Health and education contribute similarly to poverty in both groups.

In urban households, the dimension contributions between Mapuche and non-Mapuche look quite similar, the differences found are less than 3 percentage point in all dimensions. This is consistent with the previous results, indicating that in urban areas there are no significant wellbeing differences between these groups.

There are no striking differences in rural areas besides the dwelling dimension where the difference in contribution is 5 percentage points. However, the higher poverty rates for the Mapuche indicate that their well-being is much worse than that of the other group. The importance of the Mapuche dwelling situation shows a deficient situation compared to the non-Mapuche households. Nonetheless, dwelling differences could be evidence of cultural differences, thus, the gaps found could be related to differences linked to Mapuche traditions, and not necessarily linked to a situation of poverty.

The second specification attempts to account for that possibility. Under this specification, relative contributions even out further between the two groups, the highest incidence dimensions are education and labor (i.e. lack of inclusion), and the dwelling dimension decreases its contribution for

the Mapuche as expected. After taking into account some cultural differences between the indigenous and non-indigenous groups in la Araucania the different dimensions contribute similarly to  $M_0$ . This means that both groups suffer most of their deprivation in the same dimensions. Regardless this adjustment, the gaps found in the poverty rate remain high, meaning that there is a greater proportion of Mapuche households affected by these deprivations.

## VI. Conclusion and policy implications

Being able to measure and analyze multiple factors of wellbeing jointly constitutes a major advance over traditional measures of poverty. Understanding that poverty is determined not only by a shortage of money, allows for a more comprehensive analysis. This type of studies facilitates the design and implementation of more inclusive and better coordinated policies to tackle the multidimensional nature of poverty.

In Latin America, indigenous peoples have traditionally been marginalized by society and institutions, which translates into worse living conditions. The results of this study confirm this situation in the ninth region of Chile (where the Mapuche population of the country is predominantly located). Mapuche households are poorer than non-Mapuche in multidimensional terms. The welfare gaps are observed in multiple dimensions which hampers the capability development potential of the Mapuche people and fuels further inequality and conflict.

The gaps found are mainly explained by rural poverty where the proportion of Mapuche is much higher both in terms of the total rural population and in relation to the total Mapuche population in the region. On the other hand, in urban areas poverty rates for both groups are around 35% and no major differences were found in terms of deprivations.

Given that multidimensional poverty is commonly measured using deprivation thresholds and indicators that are indifferent to cultural differences, the large amount of poor Mapuche in rural areas could be reflection of the way we measure poverty and not a reflection of their actual wellbeing. Disregarding indigenous cultural factors and their worldview could lead to overestimate poverty. Thus this study attempts at to minimize this problem by proposing two different MPI specification. The results do change, but not drastically. Mapuche multidimensional poverty decreases when considering different living choices, however poverty is still much higher for the Maouche. It appears that multidimensional poverty do not originate solely from cultural differences and choices.

For both the Mapuche and the non-Mapuche, deprivations in education and labor related indicators appears to be the most important factor contributing to poverty. Since lack of education and a precarious labor situation can become a vicious circle, where low educational levels translate into worse working circumstances, and a bad job makes it difficult to deliver education to the next generations. Linked to the initial descriptive that showed a predominance of independent and agricultural work among the Mapuche, one could think of policies that foster more protection against risks, such as state-subsidized agricultural insurance allowing for better coping mechanisms for vulnerable households. In terms of education deficiencies, one could think of rural education programs that include training in different trades, in tandem with Mapuche labor programs in economic areas with less risk exposure. Further analysis is needed to determine whether the predominance of agricultural activity among the Mapuche is due to lack of opportunities elsewhere or is part of their tradition. This way policies can help maintain traditions as well as help Mapuche thrive economically.

Additionally, Mapuche households experience higher rates of deprivation in terms of access to toilet, which coupled with having dirt floors could bring greater exposure to infectious diseases and health problems. Specific home improvement programs aimed at Mapuche households in rural areas could help improve this situation.

This research constitutes a first approximation to the multidimensional analysis of Mapuche wellbeing, it is the beginning of a line of research that to date has been barely explored. It is important to acknowledge the limitations of this study. On the one hand, it is possible that poverty rates are somewhat overestimated for both groups, given that the data analyzed includes the most vulnerable individuals in the region, that is why this study does not aim to be representative of the totality of the Population in the ninth region, but shows the reality of 70% to 80% of the population in La Araucania. The many questions around the indigenous issue in Chile invite us to continue studying the different aspects and nature of their poverty. The use of a multidisciplinary approach to understand this phenomenon is crucial to better understand cultural and traditional aspects of indigenous lives. Although an initial attempt to incorporate some of these issues was done here, further research is needed complement this research in the near future.

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