

**UNDER THE VEIL OF NEOLIBERALISM: INEQUALITY,
HEALTH, AND CAPABILITIES**

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ABSTRACT

The relationship between income inequality and health has received substantial attention in the fields of medical sociology and public health and continues to be debated. In Chile, previous findings indicate that there is an income inequality effect; respondents who live in areas with high inequality experience a greater probability of poor self-reported health. This study examines the Wilkinson income inequality hypothesis in a new way by using it in conjunction with Sen's capability approach. Building from critiques of the Wilkinson hypothesis, this study also incorporates analysis of the political economy of Chile. Utilizing the 2003 and 2006 cycles of the National Socio-Economic Characterization Survey (CASEN), my findings indicate a complex relationship between income inequality and health. My analyses also suggest that there are severe inequities in health outcomes, inequities that reflect Chile's two-tier system of healthcare.

DEDICATION

To Heather, without your patience and support this would not have been possible.

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ABBREVIATIONS

CASEN	Encuesta de Caracterización Socioeconómica Nacional [National Socio-Economic Characterization Survey]
CI	Confidence interval
EU	European Union
HDI	Human Development Index
IMF	International Monetary Fund
ISAPRE	Institución de Salud Previsional (Health Maintenance Organization)
OR	Odds ratio
PAHO	Pan American Health Organization
SNS	Servicio Nacional de Salud [National Health Service]
WB	World Bank
WTO	World Trade Organization

CHAPTER 1: INTRODUCTION AND PURPOSE

Introduction

Issues of health and well-being are extremely important to researchers and practitioners from a variety of fields because health underlies all human activities. While there are many ways to approach the study of health and development, two perspectives have recently generated a significant amount of interest: Wilkinson's income inequality hypothesis and Sen's capability approach. They both are noteworthy for their attempts to challenge their respective fields' orthodoxies. The capability approach re-imagines the way we should envision development by focusing on the substantive freedoms through which people can choose a life they value, instead of the traditional focus on income (Sen 1999). The Wilkinson hypothesis attempts to identify the ways in which income inequality comes to negatively affect health, as a response to the narrow focus of epidemiology (Wilkinson 1996).

Chile provides a novel case through which to examine these approaches and to identify how they can be utilized in tandem. By assessing how income inequality comes to affect health capabilities and functionings, a more nuanced understanding of both perspectives can be achieved. The history of Chile since the 1970s is an interesting and engaging example of both the best and worst globalization and the market have to offer (Gill et al. 2005). The successes of the past two decades in the areas of economic growth and health improvement are

overshadowed by the legacy of the 1973 coup that disposed the first elected socialist president and imposed nearly two decades of brutal rule (Rector 2003). Under the Pinochet dictatorship, Chile became the first country to implement a comprehensive neoliberal economic framework. These reforms led to organizations such as the World Bank and International Monetary Fund promoting Chile as a model for development (Escobar 1995; Klein 2007; Stiglitz 2006). While a complete accounting of the effects of the 1973 coup is not the focus of this project (See Oppenheim (1993) and Stern (2006) for a more comprehensive discussion of the coup), its effects are still felt in the current system of governance and are thus an important factor when examining any aspect of Chilean society (Barrientos 2000; Borzutzky and Oppenheim 2006; Sigmund 2007).

Statement of Purpose

The purpose of this project is to examine the relationship between regional-level income inequality and health in Chile. While this project is a secondary analysis that is quantitative, it is significantly divorced from traditional stereotypes of quantitative methods. A typical belief about quantitative researchers is that they are and must be “objective” and detached from their background when examining their topic. These ideas are found widely in social science texts and discourses. For example, Creswell (1994) argues that there are psychological “predispositions” of quantitative and qualitative researchers. He claims that quantitative researchers have a “low tolerance” for ambiguity, focus

on studies of short duration, and are value-free and detached from the subject being studied (Creswell 1994).

A more nuanced version of the use of quantitative methods has come to be accepted and utilized by a variety of researchers that identify a more progressive, and even radical, use of statistics. Even Creswell (2003) himself has removed the broad characterizations of the psychology of users of different methods in more recent versions of his methods textbook. He now identifies philosophical and methodological preferences of different types of researchers and acknowledges even these are very flexible (Creswell 2003). This shift is embodied by the Radical Statistics Group, who argue “that statistics can be used as part of campaigns for progressive social change” (Radstats 2008). They note that “members are ‘radical’ in being committed to helping build a more free, democratic and egalitarian society” (Radstats 2008). As these quotes indicate, a more reflexive quantitative methodology is possible and even preferable for many.

The perspective taken in this project is critical and closely engaged with my own positionality and biases. This critical engagement is coupled with the need to present my findings as accurately as possible. My position as an American citizen, studying in Canada, examining issues in a country to which I have never been is an important issue that must be acknowledged. My role as a practitioner of radical statistics in examining a country in which my government helped facilitate a coup brings to light significant and important issues of “authenticity.” While I in no way attempt to speak for the Chileans who

participated in the survey I analyze, I do feel comfortable speaking about them and engaging that discussion within a larger context through social theory. This brings a decidedly different perspective to both the topic that is chosen as well as the interpretation of what can be seen as “true” in the findings.

In an effort to break from traditional accounts of health and inequality, I engage with many authors who have brought a critical focus to the study of development, including Joseph Stiglitz (2002; 2006; 2005), Amartya Sen (1999), and Paul Farmer (1999; 2003). Also included are those who are critical of even the idea of “development” and the discourses which surround it including Arturo Escobar (1995), Eduardo Galeano (1997 (Orig. 1971)), and Arundhati Roy (2001; 2004). These diverse (and at times contradictory) perspectives provide a deeper focus that allows both a critique of the methods and notions of development as well as a questioning of the socially constructed narratives that pervade much of the relevant literature. Used in conjunction, they bring a sharp critical edge to my analysis of inequality and health.

Through an examination of the empirical findings of the study in light of the larger political economy, a more nuanced and engaged discussion is possible. Highlighting the role of power and marginalization are important in any encounter with development (Escobar 1995). While concepts like power, class, and neoliberalism are not tested empirically, they serve to provide the historical context for the empirical analysis. The project will highlight the oppressive nature under which reforms were undertaken in Chile and the ramifications of those

roots in current policy. The possibilities for future policy reforms are also explored.

CHAPTER 2: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

This chapter explores the theoretical and empirical research on both the Wilkinson hypothesis and the capability approach. Also explored are critiques raised about both perspectives and how these criticisms are addressed in the thesis. Finally, with the theoretical foundation discussed, the research questions that guide the study are presented.

Income Inequality as a Social Determinant of Health

Wilkinson's income inequality hypothesis is situated within the social determinants of health literature (Raphael et al. 2006). This perspective grew out of the perception that epidemiology was too focused on proximal causes of disease and did not give enough attention to the role of society in the sickness and wellness of individuals (Davey Smith 2001). Link and Phelan (1995) argue that much of this focus on individual-level risk factors (e.g. smoking, exercise, diet, and hypertension) comes from the atomistic view of society that is present in much of Western culture. They note that it provides justification of individual-level interventions and can lead to blaming the victim for their health outcomes (Link and Phelan 1995).

The Wilkinson hypothesis argues that it is inequality itself that leads to poorer health within a society (Wilkinson 1996). Even in wealthy nations, individuals at the lower end of the income spectrum have an average life

expectancy between five and fifteen years lower than those in the highest income categories. In the United States individuals living in the poorest communities will experience a life expectancy 25 percent lower than individuals living in wealthy communities (Wilkinson 2005). Similar, though less extreme, patterns have also been found in England (Donkin et al. 2002), Canada (Ross et al. 2000), and other countries.

Wilkinson and others (Kaplan et al. 1996; Kawachi and Kennedy 2002; Rodgers 1979) provide conceptual models (Wilkinson 2000b) that identify pathways through which income inequality affects health. While Wilkinson has found support for a statistical linkage between income inequality and health outcomes, he attempts to identify why this exists and how the effects come about through theoretical engagement. He argues that income inequality comes to affect health through psychosocial and social capital pathways (Wilkinson 1996; Wilkinson 2000b). These pathways represent the causal connection between the statistical findings linking income inequality and health; a relationship that has been found both within- and between-countries (Wilkinson 2005).

The explanation for the psychosocial pathway, for Wilkinson, is that people examine others and reflect back onto themselves. Wilkinson claims that even though some countries may have more equal income distributions than others, individuals at the high end of the income spectrum still have better health than those directly below them. It has been observed that this health discrepancy continues all the way down the income spectrum (Kawachi and Kennedy 2002). This real and perceived inequality creates significant chronic, low-level stress

when an individual doesn't "match up" to those with which they make social comparisons (Wilkinson 1996; Wilkinson 2000b; Wilkinson and Pickett 2007). Other researchers have engaged with the psychosocial aspects of inequality and cite research on hierarchy in both primates and humans as evidence of this effect. Brunner (1997) identified biological factors that make up the stress response and argues that these can have a very negative effect on health, particularly over a long period of time. The "fight or flight" response and its biological effects, including the release of cortisol, may be adaptive in the short term but increases the risk of a variety of diseases, including coronary heart disease and diabetes (Brunner 1997; Wilkinson 2000b).

For Wilkinson and others (Turner 2003; Wilkinson 2005), a second important pathway through which income inequality affects health is social capital. Social capital may be defined as "connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam 2000: 19). Areas with more inequality, Wilkinson argues, are likely to have less social capital. A lack of social collaboration leads to poorer health. People in areas of high inequality are less likely to act together in mutually beneficial ways (Wilkinson 2005). Increased stratification leads to societies that are more hostile with higher rates of violence, crime, and lower feelings of social cohesion. The weakening of communal social life also has detrimental effects on health (Putnam 2000). The relationship between inequality and social capital is quite strong in both U.S. states and among regions in Italy (Wilkinson 2005). Cox argues that rising inequality in Australia has led to a decline of social capital

and civil society (Cox 2002). In Latin American, Portes and Landolt (2000) argue, the rise of neoliberalism led to the decline of social capital throughout the region.

Turner (2003) notes that this focus on social capital relies, often implicitly, on the work of Durkheim by emphasizing the atomizing effects of low social capital. Durkheim used measures of social cohesion and trust as evidence of social bonds, or a lack thereof. Social bonds in the modern era, Durkheim argued, were based on organic solidarity, defined as the linkages between people based on specialization in work and the interdependence that was required for a functioning society. Previously, bonds were based on a shared experience, termed mechanical solidarity (Durkheim 1947 (orig. 1893)).

Durkheim discussed the rise of individualism and its detrimental effects on social capital at length in his work on suicide in France in the 19th century. These negative effects of social atomism have come to be emphasized in critiques of neoliberalism (Turner 2003).

Putnam (2000) argues that social capital is a complex idea, and has been independently invented at least six times by scholars from a variety of fields, though with slightly differing accounts of its meaning. Wilkinson (2005) argues that due to this complexity some on the political right have misinterpreted and co-opted social capital. He provides the example of politicians using social capital to justify not spending funds to tackle poverty because the politicians argue that it is the poor social relations in the community instead of structural factors (Wilkinson 2005). Furthermore, Navarro (2002a) argues that the type of social capital discussed by Putnam lacks an adequate connection to issues of power and

politics. Though this study does not directly measure social capital, the concept does serve as an important theoretical pathway through which income inequality likely affects health. The critique provided by Navarro necessitates engagement with the political economy of Chile when discussing the relationship between income inequality and health.

A crucial concept underlying both the psychosocial and social capital pathways is *relative deprivation*, the idea that an individual feels they do not have something (either a good or a position) that they deserve or is required for adequate social function. The work of Peter Townsend (1974) is important in this tradition; he notes that “individuals, families and groups in the population can be said to be in poverty when they lack the resources to obtain the types of diets, participate in the activities and have the living conditions and amenities which are customary, or are at least widely encouraged or approved, in the societies to which they belong” (1974: 16). This lack of resources, he argues, leads to social exclusion.

Wilkinson argues that relative deprivation underlies both the psychosocial and social capital pathways. It underlies the psychosocial pathway in that individuals experience chronic, low-level stress due to their lack of the desired good or position and this stress in turn damages their health (Wilkinson 2000b). Relative deprivation is fundamental for the pathway of social capital through resentments that become harboured by those who experience deprivation in society. It leads to a loss of social trust, weakening of social networks, and decreased participation in community activities (Wilkinson 1996).

Empirical Literature on Wilkinson's Income Inequality Hypothesis

Researchers have used various measures for both inequality and health in order to test the relationship between income inequality and health and have produced mixed results (Lynch et al. 2004; Wilkinson and Pickett 2006). There are various explanations for this. One idea put forth by Wilkinson and Pickett (2006) is that while there was a period of time in which researchers found little support for his hypothesis, it appears to be an anomaly. They found that in the mid-1980s there was a time in which there was not a significant relationship found between income inequality and certain health measures in a small number of between-country studies. These countries were experiencing a sharp rise in inequality and support for the hypothesis was lost for adult mortality. However, the relationship remained supportive for inequality and infant mortality. Though it would seem that rising inequality would make support for the hypothesis more likely, Wilkinson suggests that these findings are in part due to shorter lag effects for the young than for adults (Wilkinson and Pickett 2006). He argues that more recent data sets now corroborate the original findings on which his hypothesis is based (Wilkinson 2005; Wilkinson and Pickett 2006; Wilkinson and Pickett 2007).

Wilkinson and Pickett (2006) reviewed 155 articles containing 168 analyses that examined the relationship between inequality and health in order to better understand where the hypothesis stands currently. The articles were classified into three groups depending upon the statistical significance of their findings: supportive, partially supportive, or unsupportive (Wilkinson and Pickett 2006). They found that three-quarters of these analyses were either supportive or partially supportive of the Wilkinson model. Over half of the analyses surveyed

were fully supportive. Wilkinson and Pickett found that the size of the area studied was a critical factor in whether or not the findings supported his model. They note that when the size of the area in the analysis is taken into account, the support for his theory goes up significantly. The analyses that examined only areas the size of metropolitan centres or larger were more likely to be supportive of the model; with 128 analyses showing support while only twenty-three do not (Wilkinson and Pickett 2006). Wilkinson (1997) argues that the level of geographical abstraction is important because for smaller areas, such as neighbourhoods, it is not the inequality within each neighbourhood that is important but their lower position relative to the wider society that matters.

Another view is that these unsupportive findings show an inherent weakness of the Wilkinson model (Lynch et al. 2004). In their review of relevant literature, Lynch et al. (2004) conclude that Wilkinson has overstated the support for a relationship between income inequality and health. Lynch et al. (2004) examined 98 studies that test the relationship between income inequality and health empirically. All of the studies examined were either aggregate, individual level data that was collapsed into larger classification (e.g. countries, provinces, counties) or multilevel, individual level data that also takes into account where that individual lives (at multiple levels). They included both between-country studies and within-country studies. Overall, they conclude that there has been little support for the Wilkinson hypothesis in “rich” countries, with the exceptions of the United States and to a lesser extent the United Kingdom, and mixed

support elsewhere. However, even in the United States, where supportive results were most consistently found, there were often mixed results (Lynch et al. 2004).

The strongest support for the Wilkinson hypothesis has been found in the United States where a hypothetical 1% increase in the income share of the lowest 50% of the working-age population would reduce mortality by 21 deaths per 100,000 (Ross et al. 2000). The United States is one of the countries that has been most heavily influenced by neoliberalism and, therefore, is less concerned about inequality (Coburn 2000). One reason for the dominance of neoliberalism in the United States is that many tenets of neoliberalism coincide with the cultural norms of individualism found in the United States (Vandello and Cohen 1999). However, the Wilkinson hypothesis has most often applied to countries that are more equal than the United States (Lynch et al. 2004). This may be part of the reason for the lack of support. It has also been noted that countries with larger social safety nets may have better outcomes because they mitigate some of the negative effects of the inequality (Lynch et al. 2004; Ross et al. 2000).

Some researchers argue that the hypothesis is more a statistical artifact as opposed to a substantive correlation (Kawachi and Kennedy 2002). They note that the early work of Wilkinson linking income inequality to health has been partially discounted in light of more recent findings in developed countries. However, they identify that these early findings are not the only sources of support for the Wilkinson hypothesis. Judge (1995) argues that a reinterpretation of some of Wilkinson's original work on inequality produces a different result. He

notes that the method of measuring income inequality was controversial at the least and possibly “derived from the data” at worst (Judge 1995: 1283).

Wilkinson (1995) argues that while Judge addresses some methodological issues of some of his original analyses, that critique does not impugn the vast array of other supportive findings between income inequality and health.

This apparent lack of support seems to be a matter of perspective. There was no statistical significance found between income inequality and health in many developed countries, with the exception of the United States and the United Kingdom (Lynch et al. 2004). This lack of a relationship may in fact be pointing to larger social factors. It is important to examine what are the possible social factors that are bringing about this lack of significant relationship. Institutions that mitigate inequality in these countries could be playing a major role in making the relationship between income inequality and health not significant. Ross et al (2000) identify that the lack of significance between inequality and mortality in Canada is due to lower levels of inequality and also strong social policies that mitigate the effects of inequality. Lynch (2004) adds that issues like mistrust of government, tolerance for inequality, and lack of a strong welfare state may be responsible for the findings of support for the Wilkinson hypothesis in the United States and United Kingdom.

While initial research on the Wilkinson hypothesis focused on developed countries, researchers are beginning to apply it to other countries, often more unequal than the United States and United Kingdom (De Maio 2007a). The hypothesis has been tested in developing countries including Chile, Argentina,

Brazil, and a handful of others. Chile, Argentina, and Brazil have significantly higher levels of inequality than is typically found in the global North (Lynch et al. 2004; Subramanian et al. 2003; UNDP 2007). While the use of the Wilkinson model for studying developing nations is not yet widespread, it is beginning to show promise. One reason for the lack of focus on developing countries has been because Wilkinson argues that up to a certain level income (about \$5,000 per capita) health status (life expectancy is used most often) increases quickly. After this point, further increases in per capita income do little to explain the differences in health outcomes experienced by different countries (Kawachi et al. 1999; Wilkinson 1994). For countries below this line the income inequality hypothesis may not have as much applicability as absolute income appears to be playing a larger role (Kawachi et al. 1999). This level of per capita income typically coincides with countries that have experienced the epidemiological transition, where the leading causes of mortality are noncommunicable diseases instead of infectious ones (Wilkinson 1999)

There were an insufficient number of studies of developing countries to make generalizations of findings (Lynch et al. 2004). Support for the hypothesis was found in Chile (Subramanian et al. 2003) but not in Brazil (Messias 2003; Szwarcwald et al. 2002). Messias (2003) found mixed results between the Gini coefficient¹ and life expectancy when examining the relationship at the regional level in Brazil. Szwarcwald et al. (2002) examined income inequality and health

¹ The Gini coefficient ranges from zero, a perfectly equal society, to one, a perfectly unequal society where one individual earns all of the income. The Gini coefficient can also be presented on a scale from zero to one-hundred, though the interpretation is the same, with higher number representing higher inequality (Wilkinson 2005; De Maio 2007b).

in neighbourhoods of Rio de Janeiro. The Gini coefficient was also used in this study to measure income inequality while infant mortality rate, neonatal, and post-neonatal mortality rates were used as health measures. Similar to Messias, Szwarcwald found mixed results in their analysis (Szwarcwald et al. 2002).

In an example of the Wilkinson model being carried out in Chile, Subramanian et al. (2003) examined the relationship between income inequality and health using a national-level data set that was also broken down by region, community, and household. Chile is an interesting application of the Wilkinson model because the inequality experienced by Chile is significantly higher than what is experienced by other countries in which comparisons have been carried out (Subramanian et al. 2003). Japan, Sweden, Denmark, and New Zealand² are more egalitarian and/or have stronger welfare state protections than the United States and the United Kingdom. They note the support for the Wilkinson hypothesis has been limited in these countries. Applying the hypothesis to countries with higher inequality is important for Subramanian et al. because they note that the relationship between income inequality and health has been questioned and that the hypothesis is losing credibility. They argue that this sort of conclusion is premature and that more studies of developing nations would be useful (Subramanian et al. 2003).

Subramanian et al. used self-reported health as their measure for population health. For income inequality, the Gini coefficient was used. Using a

² The most recent data from the UNDP (2007) on the Gini coefficients of these countries is 24.9 for Japan, 25.0 for Sweden, 24.7 for Denmark, and 36.2 for New Zealand. The United States and United Kingdom are 40.8 and 36.0, respectively. In the report Chile's coefficient is 54.9, among the highest in the world (UNDP 2007). See the methods section for a more complete discussion of the Gini coefficient.

multilevel regression analysis³, a significant relationship was found between income inequality and health. More specifically, they found that in areas with higher inequality there was a 22% increased likelihood of poor or very poor self-assessed health; a finding clearly supportive of the Wilkinson hypothesis. They also note the possibility of a threshold effect in Chile, with areas with a Gini coefficient above 0.45 being most likely to increase the probability of reporting poor health (Subramanian et al. 2003). In other words, in areas with Gini coefficients less than 0.45, income inequality may not yield a negative effect on population health.

De Maio (2007a) found results in Argentina that are more complex than those found in Chile. Through using different measures to operationalize both health and inequality, De Maio was able to identify that the operational definitions used for income inequality and health play an important role in the findings. When self-assessed morbidity was used as the measure of population health, the relationship between income inequality and health was not upheld. When the same analysis was carried out using mortality data, the relationship was found to support the Wilkinson model. Finding that self-reported morbidity and measures of mortality are not interchangeable helps shed light onto the possible contradictions found in the empirical research on the Wilkinson model (De Maio 2008). The reliability of self-assessed health measures has also been questioned

³ Multilevel regression utilizes hierarchical data in order allow individuals to be analyzed within the context of the larger data set. For example an individual could be nested within the province or city in which they live and also within the region they live. This allows for more accurate regression coefficients and associated p-values (Austin et al. 2001)

more generally as their placement in surveys can lead to significant bias (Crossley and Kennedy 2002; Sen 2002).

Criticisms of Wilkinson's Hypothesis

Coburn, writing from a political economy perspective, argues that Wilkinson does not adequately take into account larger issues such as neoliberalism that affect social cohesion, inequality, and health all at the same time. For Coburn, it is important to take into account the political and economic context in order to have a better understanding of issues of inequality and its relation to health (Coburn 2000; Coburn 2004).

Coburn (2004) argues that the causes of income inequality in a country are often not examined in studies of the Wilkinson hypothesis. The reasoning for this omission is that it is more likely that change could be enacted to mitigate the relationship between inequality and health than to actually address inequality by itself. He notes that there are large social forces like globalization and the decline of the welfare state that are playing an important role in structuring inequalities. The largest source of these changes comes from the rising hegemony of neoliberalism. He argues that neoliberalism is responsible for both the increase of inequality and the decline of social cohesion. Coburn (2000) believes that the relationship observed by Wilkinson and others provides an account of these issues that is too narrow. For Coburn, it would be better to broaden the scope of the analysis to examine the effects of neoliberalism more generally.

The argument put forth by Coburn is an important one. However, I do not think that it represents a disabling critique of Wilkinson's hypothesis. A disabling

critique would be one to which the Wilkinson hypothesis could not be adapted to. I would argue that Coburn's critique provides an impetus to broaden the scope of analysis when using the Wilkinson hypothesis. Engaging with the critique requires exploring other sets of issues, such as relations of power and politics. Combining these perspectives creates a complementary analysis, as the final product is better able to engage with the context of the relationship between income inequality and health; in this case identifying the role of political economy in Chile. This view is echoed by Wilkinson (2000a) in his response to Coburn's critique.

Wilkinson (2000a) argues that his use of the social determinants of health perspective intrinsically takes into account issues of society including economic and political context. Wilkinson believes that the policy recommendations that would be made would be similar regardless of whether the focus is on neoliberalism or specifically the relationship between income and health. However, mitigating the ill effects of income inequality and addressing income inequality itself would likely require significantly different responses. Another important response from Wilkinson is that it is not the extent to which neoliberalism is affecting society that is central. He is interested specifically in how differing levels of inequality come to play a role in health. He notes that the psychosocial effects of subordination are something that examining neoliberalism cannot take into account (Wilkinson 2000b).

Muntaner and Lynch (1999) also provide an interesting critique of the Wilkinson hypothesis. Their focus is on how issues of class are related to health

and inequality. They argue that Wilkinson's focus on income inequalities instead of class ignores how important class is in affecting differential experiences of wider opportunities within society, including things such as income inequality and health. The choice of income inequality, they argue, is also due to the availability of relevant data, whereas for class such data is much more difficult to ascertain. Using a direct class measure would provide a better idea of how particular classes are deprived of access to health care or have poorer health outcomes. It would also allow analysis of the social mechanisms that underlie these relationships. For them, Wilkinson overestimates the power of social cohesion and underestimates the role of political factors in creating health outcomes. They note that this lack of engagement with politics is important because it affects the types of policies that can be implemented using the theoretical framework of the Wilkinson hypothesis. They also note, like Coburn, that the income inequality model does not adequately engage with the structural forces that bring about inequality in the first place. Another significant argument they make is that the work of Wilkinson can be co-opted by forces that are antithetical to the work of Wilkinson and others (Muntaner et al. 1999). Muntaner (2003) argues that social capital becomes a way to blame communities for their poor health while at the same time justifying cuts to the social welfare state. He notes that Wilkinson would reject this politically conservative interpretation of his work and the role social capital plays in it. Instead, Wilkinson would support a reduction in inequality as the goal, and recommend policies aimed at that outcome (Muntaner 2003).

Though these perspectives are at odds on some level, they could be useful when used in conjunction. While a view of the effects of inequality on health may not account for the structural factors that bring about either, it is still useful to question if this relationship exists. Also, it is useful to identify the pathways through which inequality could come to affect health, regardless of structural factors. Focusing on the political and economic context in which inequality and health reside is also useful, as it better allows a view of how structural forces are either enabling or mitigating the effects of income inequality on health.

The criticisms put forth by Muntaner and Lynch have merit and are similar to those put forth by Coburn. The argument made that this type of work is more susceptible to co-optation than one based on political economy is an important one (Muntaner 2003). An analysis of inequality that also engages with class and the sources of the inequality would make it more difficult to draw politically conservative policy lessons because it would reveal the exploitive nature of the current mode of production. Identifying structural factors as the source of the inequality would make blaming communities or individuals for negative outcomes much more difficult (Coburn 2004). Muntaner (2003) argues that recent works have utilized the social cohesion model to “blame the victim” in the case of poor neighbourhoods in the United States, though it is hard to fault Wilkinson for this co-optation. Overall, Coburn, Muntaner, and Lynch all serve to make researchers using the Wilkinson hypothesis aware of areas that their research may not directly address.

By identifying the political economy in which the data used in this study exists, it helps to ameliorate these weaknesses while strengthening the analysis overall. This study examines some of the forces in Chile that led to the current situation of income inequality and inequitable health outcomes. This study addresses the weaknesses of the Wilkinson hypothesis by looking both at the internal and external forces that allowed the rise of Pinochet and led to the dominance of neoliberal policy even after the return to democracy. Both the dominant classes in Chile (Zeitlin and Ratcliff 1988) as well as powerful international organizations (Klein 2007) contributed to the situation. The capability approach helps further this understanding by providing a different way of envisioning development and identifying useful new ways of measuring outcomes.

Sen's Capability Approach

The capability approach is a growing paradigm in international development that attempts to shift the definition of development in a fundamental way. Previously, income has been the dominant factor through which development is judged, through measures such as GDP per capita⁴ (Isbister 2003; Kegley and Wittkopf 2001; Macionis 2001). Sen argues that this pre-occupation with income loses sight of the fact that income is merely instrumental

⁴ It is important to differentiate gross domestic product (GDP) from gross national product (GNP). GDP takes into account the total value of products and services produced by a country, regardless of the nationality of those producers or service providers. GNP takes nationality of producers and service providers into account and places their contribution with their country of permanent residence regardless of where they currently reside. GDP is more commonly reported (Macionis 2001; Kegley and Wittkopf 2001). For a critical perspective on GDP, see Isbister (2003).

in providing goods and services that people need. He proposes a focus on substantive freedoms in its place. Substantive freedoms, what Sen terms “capabilities”, represent things that individuals are free to do or have that would be valuable to them, such as freedom from fear of violence or freedom to health care and sufficient nutrition (Sen 1999). Sen notes that “viewing development in terms of expanding substantive freedoms directs attention to the ends that make development important, rather than merely to some of the means that, inter alia, play a prominent part in the process” (1999: 3).

The example of education is particularly illustrative in this case. Within the income-as-development approach, education is useful because it raises individuals’ incomes and will increase a country’s overall GDP per capita. Sen identifies how this is not a useful way to view education. Education is a good thing by itself. It increases an individual’s ability to make choices that allow them to have a life they value. According to Sen, those that support education or other similar goods such as democracy or basic health care primarily as a means of increasing economic output are missing their larger benefits.

One important reason why Sen identifies using income alone as insufficient is his emphasis on the important difference between “culmination outcomes” and “comprehensive outcomes”. These terms refer to the way in which outcomes are evaluated. Culmination outcomes do not take into account the process by which the outcome was generated. Comprehensive outcomes identify the processes that gave rise to a particular outcome. This distinction is significant for Sen because even if two countries had similar GDP per capita, it is

difficult to say that they are equal without identifying the way in which that outcome came about. For Sen, the process of development is as important as the end result.

In *Development as Freedom*, Sen (1999) defines development as increasing individuals' ability to choose a life that they have reason to value by reducing unfreedoms such as starvation, oppression, racism, sexism: "Expansion of freedom is viewed, in this approach, both as the primary end and as the principal means of development. Development consists of the removal of various types of unfreedoms that leave people with little choice and little opportunity of exercising reasoned agency. The removal of substantial unfreedoms, it is argued here, is constitutive of development" (Sen 1999: xii).

The central thesis of the capability approach is that substantive freedoms are the ultimate end, as well as the primary means of development (Nussbaum 2006; Sen 1999). For Sen, this point is the most fundamental in the capability approach and deserves further explanation. Substantive freedoms – or as Sen terms them, "capabilities" – serve as the central factor of development by allowing people to live lives they have reason to value. Substantive freedoms are the primary end of development because they are fundamental rights that represent real opportunities for individuals to create a life they can value (Nussbaum 2003). They also serve as the primary means of development because they increase the ability of individuals to make choices to improve their lives (Sen 1999). This focus on agency of individuals in development

differentiates it from many other perspectives that envision individuals as passive recipients of public policy (Ruger 2004).

Some key terms that are used in the capability approach are functionings, functioning vectors, capabilities, capability sets, substantive (positive) freedoms, negative freedoms, and unfreedoms. The most important type of freedom for Sen is substantive freedom, also known as positive freedom. A substantive freedom is something that an individual is free to do. Another type of freedom is a negative freedom, a freedom from some particular externality. Related to this is Sen's use of the term unfreedom. Unfreedoms are things that create significant obstacles to living a life that a person has reason to value. Examples of unfreedoms include tyranny, hunger, and racism (Sen 1999). Another important example of a substantial unfreedom is violence against women (Nussbaum 2005).

Capabilities and functionings are the two central terms of the capability approach. Sen defines functionings as "the various things a person may value doing or being" (Sen 1999: 27). Functionings are critical because they represent everything from basic functionings, such as having enough to eat, to more abstract functions, such as having sufficient self-respect. For Sen, an individual's capability is "the alternative combinations of functionings that are feasible for her to achieve" (Sen 1999: 75). They represent the actual range of possibilities that a person is free to choose from (Sen 1999). In the empirical literature, it is argued that functionings are the manifest aspects of capabilities, which are latent. The capability of health could, for example, be examined through measuring

functionings such as life expectancy, infant mortality rate, morbidity rates, or other measures (Anand 2005; Krishnakumar 2007). For education, literacy rates or an individual's highest level of education could serve as functionings measures to assess the capability of access to education. For those who lack education, exogenous factors that affected this capability could be explored, such as lack of a school or lack of money to attend school (Krishnakumar 2007; Otto and Ziegler 2006).

Sen further explores these concepts through functioning vectors and capability sets. Functioning vectors and capability sets are used when attempting to represent functionings quantitatively. Each realized function is given a number and the combination of achievements becomes the functioning vector. The capability set represents the alternate possible functioning vectors available to a person (Sen 1999).

Capabilities are extremely diverse. Nussbaum (2006) has constructed a list of capabilities that she deems to be among the most essential (see appendix A for the complete list). These include fundamental capabilities such as access to clean water and sufficient nutrition to prevent premature death. Nussbaum's list also includes more abstract capabilities (though not necessarily any less important) including expressing yourself or "being able to play, to laugh" (Nussbaum 2006: 59). Sen has refused repeatedly to endorse a list of fundamental capabilities because he believes that they should develop organically from each country/culture in which the approach is being utilized (Sen 1999; Sen 2004).

Another important aspect of the capability approach is that it shifts the focus of development from quantitative measurement of peoples' livelihoods to improving individual agency. This places the capability approach in line with critics of development more generally (Escobar 1995; Roy 2004). Escobar (1995) argues that development discourses are more concerned with good relevant statistics (GDP per capita, foreign direct investment, economic growth) instead of improving the lives of individuals: "Development was – and continues to be for the most part – a top-down, ethnocentric, and technocratic approach, which treated people and cultures as abstract concepts, statistical figures to be moved up and down in the charts of 'progress'" (1995: 44).

Within my thesis, the capability approach provides a useful way to examine how income inequality affects health capabilities. Through the measurement of functionings and the examination of how inequality affects these functionings, the effects of inequality on health capabilities can be inferred. Sen identifies the key role of inequality in creating poor outcomes: "*Relative deprivation in terms of incomes can yield absolute deprivation in terms of capabilities. Being relatively poor in a rich country can be a great capability handicap, even when one's absolute income is high in terms of world standards*" [emphasis in original] (Sen 1999: 89).

The capability approach represents more than just an approach to research. Sen argues that it can be utilized as a fundamental framework to make linkages between research and larger issues of development. These larger issues of development include social goods (education, health, safety),

democracy, and infrastructure (Sen 1999). This relationship between the theoretical level and the empirical level has been noted as a strength of the perspective (Alkire 2005; Robeyns 2005a; Robeyns 2005b).

Coming from the field of economics, Sen has been influenced by notions of positivism and an emphasis on quantitative methods. This training can be seen in Sen's discussion of functioning vectors. The notion that an individual's realized functionings can be represented numerically belies the emphasis on quantification of social phenomena, a controversial proposition for some (Escobar 1995). It is important to note, however, that Sen accepts neither a strictly objectivist ontology nor a completely positivist epistemology in the capability approach (Benton and Craib 2001; Bryman and Teevan 2005). He discusses at length the difficulty of measuring, as well as conceptualizing, capabilities and functionings. The capability approach takes on aspects of critical realism in that it identifies that different perspectives of development can be "true" in some sense, though none of them represent the complete picture⁵ (Sen 2004). In this sense, the approach takes on some of the principles that have come to be identified with realism. Underlying Sen's discussion of the capability approach is an attempt to identify causal relationships, as opposed to just describing social phenomena. Finally, while Sen does attempt to situate both agency and structure, it has been argued that he does not engage with structure

⁵ An objectivist ontology views that there exists a coherent external reality that can be measured. This contrasts with a realist ontology that argues that a theoretical understanding of "reality" is the most accurate that can be achieved. What is deemed reality is always changing as it is a social reality that is being constructed. A positivist epistemology argues that through research this objective reality can be measured accurately using falsifiable hypotheses and triangulation. A critical realist epistemology attempts to utilize the theoretical notion of realism but adds to it a critical aspect that requires continual re-examination of the phenomena in question (Bryman and Teevan 2005; Benton and Craib 2001).

in a sufficient way, as will be discussed later under criticisms of the approach (Delanty 1997; Navarro 2000).

Sen (1999) and others identify functionings as dependent on the context in which an individual resides. While there are some functions that can be seen as very basic, such as having adequate food, Sen (2004) does not accept that it is useful to create a list of fundamental freedoms. This debate represents a significant limitation of the capability approach to Nussbaum (2003), who has also had a significant influence on the capability approach. Sen's reticence to universalize notions of functionings in the capability approach represents recognition of the importance of relativism. The valuing of construction of social reality at a local level is something that is not typically associated with larger economic theory (Sen 1999).

Critiques of the Capability Approach

Nussbaum (2003; 2005; 2006) has published extensively about the philosophical underpinnings of the capability approach and is also one of its most vocal champions. Her particular contention marks a significant difference between her perspective on the capability approach and that of Sen (2004). Nussbaum (2006) argues that it is necessary to create an open list of fundamental capabilities. This would be similar to the creation of the basic set of human rights used by institutions such as the United Nations. However, the process of creating a capability list would be significantly different from the UN Declaration on Human Rights because it would require more cross-cultural input in its initial creation and also localization within different countries and cultures.

Nussbaum (2006) argues the particular capabilities list that she is endorsing is very flexible, which makes it very different than a human rights perspective. She believes that any list of fundamental capabilities must take into account cultural differences, unlike the UN Declaration. Also important is that the list does not represent a finished product. For such a list to continue to be relevant, Nussbaum argues that it must be able to adapt to changing realities over time and across cultures. The current incarnation of the list focuses on ten central capabilities including things such as life, health, emotions, and control over one's environment (see appendix A for the full list). Nussbaum believes that Sen's lack of endorsement of a list is a significant limitation, as there is no good way in which to make comparisons across different capability perspectives without one (Nussbaum 2006). The list proposed by Nussbaum has been used empirically in at least two studies (Anand et al. 2005; Anand and van Hees 2006).

I think that this particular criticism is a good one and raises the question of how different researchers can be accountable for the particular capabilities they are studying. The danger of a completely relativistic notion of capabilities is that it does not adequately allow for a meaningful comparison, and thus an adequate critique of different conceptions of capabilities. The fully reflexive list put forth by Nussbaum is a good start because she recognizes the limitations of the list cross-culturally and advocates its localization within a particular context that is being studied (Nussbaum 2006). This is useful because it continues to allow the differential weighting of capabilities across different societies but allows the

discussion to begin with some central notions that are often deemed as fundamental. At the same time, it does not attempt to create an overarching development discourse to which all societies must accept without criticism (Escobar 1995).

The capability approach has also faced criticism from scholars in the field of development. For example, Navarro (2000) argues that it does not adequately address issues of power. He believes that connections of political economy and the effects of outside forces on the direction of policy cannot be explored sufficiently through the capability approach. He argues that while the capability approach is a novel and well-received addition to the study of development, it does not “focus on the sources of power in a society and how that power is reproduced” (Navarro 2000: 666). For Navarro, the capability approach does not adequately engage with sources of power that stem from issues of class, race, gender, and national or supranational power.

This study engages with this limitation through examining the political economy of Chile. Though this study does not test “power” empirically, power underlies much of the political economy analysis. Identifying who has power and the type of power they possess is an important part of the discussion. The evolution of Chile from the 1970s allows engagement with differing types of power, including nearly absolute power of the military and ruling classes in the period after the overthrow of Allende (Rector 2003). Also, the transition to an increasingly democratic government after 1990 provides another example of power (Hira and Sanghera 2004).

Issues of Empirical Application of the Capability Approach

The empirical use of the capabilities approach and the operationalization of capabilities and functionings are the subject of intense debate. The term operationalization refers to developing empirical measures for a concept that is to be tested (Bryman and Teevan 2005). Operationalization is important because it underlies the measurement and analysis of complex concepts such as well-being and poverty. These debates have led to significant insight into possibilities for using the capability approach empirically.

Using the capability approach in an evaluative way is central to Sen. He notes three approaches to operationalizing the capability approach. Each approach has strengths and weaknesses, and the ultimate decision should be related to what it is being used for. The three alternative ways put forth by Sen (1999) are the direct approach, the supplementary approach, and the indirect approach (see table 1).

Table 1. Approaches for Operationalizing Capabilities

Direct Approach	Supplementary Approach	Indirect Approach
Directly examines and compares functionings and capabilities. Variants include: (1) total comparison, (2) partial ranking, and (3) distinguished capability comparison. Total comparison and partial ranking require estimating the value of a particular functioning or capability.	Broadens the informational base of a study that is utilizing income measures by including capability considerations.	Income is used as the primary measure but is adjusted either up or down because of the presence or absence of a particular capability or functionings. Requires specific ranking of differing capabilities and functionings.

Note: See Sen (1999) for a complete comparison.

The variation utilized in this study is a distinguished capability comparison, one of the three types of analysis within the direct approach. In this variation, the capability of health is the focal point (Sen 1999). The distinguished capability comparison is one of the most common forms used in the empirical literature of the capability approach. Most studies using a distinguished capability comparison attempt to identify two or three issues of capabilities or functionings. Then the study makes comparisons between the measures without actually weighting one capability or functioning as more important than another. Most use some measure of income as well as some other variable to which income is compared. Examples of distinguished capability comparisons include examining social inclusion (Wagle 2005) and education (Otto and Ziegler 2006).

The most prominent and controversial use of the capability approach has been in the Human Development Index (HDI). The United Nations Development Programme and other international institutions use this measure to rank and assess countries. It is based on an index composed of weighted measures for education, life expectancy, and GDP per capita (Osberg and Sharpe 2005). One reason it has been a controversial measure is because of its narrow focus on only three factors (technically four because two measures are used for education) (Ranis et al. 2006). Ranis et al. (2006) argue that due to this narrow focus the HDI does not adequately provide information on a wide variety of factors that are as or more important than education, life expectancy, and GDP. Similarly, Sagar and Najam (1998) argue that adding measures of inequality, changing the way the index is calculated, and adding a more nuanced treatment

of GDP would be important first steps toward increasing the usefulness of the HDI.

Another significant debate has been how useful the capability approach is for quantitative versus qualitative research strategies. Zimmermann (2006) argues that the capability approach has often been used in a way that is too quantitative. He argues that the use of aggregated individual level data, often from secondary sources, does not allow adequate identification of social context. Zimmermann goes on to posit that qualitative methods would be able to better serve the action-oriented nature of the capability approach (2006). Frediani (2007) utilizes a qualitative content analysis strategy to examine issues of urban poverty and squatter settlements. He argues that the World Bank utilized the language of the capability approach of empowerment and opportunity while at the same time advocating for the implementation of policies that restrict the agency of already marginalized urban residents in Brazil.

This qualitative focus differs significantly from the one put forth by many in the field of economics. Many researchers in this area are attempting to use the capability approach in order to create refined metrics to measure capabilities in an exact way. A good example comes from Lelli (2005) who attempts to create equivalence scales that would allow comparison between heterogeneous households on issues of income and welfare. She attempts to create a variable that would encompass “the largest possible part of information at our disposal” (Lelli 2005: 266). Lelli concludes that equivalence scales that take into account

the capability approach represent a significant step forward in generating information for welfare comparisons (Lelli 2005: 277-278).

Gaertner and Xu (2006) also provide a very quantitative, positivist account of the possibilities of the capability approach. They note that choosing a reference functioning vector is conceptually difficult but ask the reader to “assume for the moment that our problem has been solved” before proceeding with their analysis (Gaertner and Xu 2006: 315). This positivist assertion that functionings measures require a “solution” as opposed to constant reinterpretation provides a much more positivist application of the capability approach.

Anand (2005) and Cookson (2005) provide a good discussion on the controversies of operationalization on the issue of Quality Adjusted Life Years (QALYs)⁶ as a measure for health. Cookson argues that there are not yet sufficient ways to directly assess capability sets using available data. In light of this deficiency, he proposes that QALYs be used as a proxy in order to be able to make interpersonal comparisons of capabilities. He proposes that QALYs can be interpreted to represent “all of the individual’s well-being” (Cookson 2005: 825). Anand argues that this use of QALYs is insufficient because such an index fails to represent a “comprehensive measure of an individual’s well-being” (Anand 2005: 1283). Further, it is unnecessary at this time to try to create such a comprehensive measure (Anand 2005).

⁶ Quality Adjusted Life Years are a relatively recent way to measure health. Instead of just life expectancy, quality adjusted life years take into account how healthy a person is as opposed to just being alive or deceased. One year of perfect health is equal to one. Anything less than perfect health is less than one but above zero (Phillips 2001).

Another significant debate focuses on the broad nature of the theoretical framework of the capability approach. One of the significant contentions here is whether the intrinsic vagueness in the theory is a strength or a weakness. Some authors have noted that while the capability approach is vague and difficult to operationalize, they believe that these criticisms at some level also represent significant strengths (Alkire 2005; Martinetti 2004). Within this area of debate, these authors argue that the approach represents a significant step forward in terms of creating an overarching framework that can also have practical and empirical uses. In particular, this is discussed by Alkire (2005), who notes that the separation between the foundational level and the operational level of the capability approach is an important one. For her, they represent two different but connected parts of the capability approach. The foundational level is the theoretical construction of the capability approach and she notes that it is characterized by pluralism as well as an intrinsic vagueness. Pluralism and vagueness are deemed strengths, in that they allow the capability approach to find a variety of uses at the operational level. The operational level is the point at which the capability approach is used to create a methodology for a particular study. While the operational level must reference the foundational level, there is significant variability in how the capability approach can be used. Also, Alkire (2005) argues that this separation of the operational from the foundational allows for a narrow focus at the operational level without losing sight of larger issues that are addressed at the foundational level.

Empirical Use of the Capability Approach

Fields as diverse as health studies, economics, feminist studies, sociology, psychology, and social work have utilized the capability approach. Sen himself has examined issues such as regional differences in capabilities in India (Dreze and Sen 1997), issues of hunger across different countries (Dreze and Sen 1989), as well as many others. These different empirical studies are useful to examine because they present different levels of analysis at which the capability approach may be used. Analyses at the individual, regional, and national level are all possible for empirical studies using the capability approach.

In his discussion of India, Sen uses aggregate data for different regions and attempts to discern why different regions have significantly different outcomes (Dreze and Sen 1997). In their discussion of hunger, Sen and Dreze use aggregate statistics at the country level and attempt to make comparisons between these countries on issues of hunger and the capability effects that either enable or disable the ability to have enough to eat (Dreze and Sen 1989).

Many articles have utilized the capability approach in reference to health, either as its central focus or as one of many capabilities being examined. Of primary importance is how health is conceptualized and operationalized. These studies inform the operationalization that has been carried out for this project.

Table 2 summarizes a set of key articles that utilize health capabilities empirically⁷.

As is evident from the review, health was most often used as an independent variable among other independent variables and regressed with a central dependent variable. The articles provide a key look at differing methods for operationalizing health in a capabilities analysis. Particularly useful is the study carried out by Anand and van Hees (2006). In it, they used a mail questionnaire that has questions designed to measure both capabilities and functionings. Through questions that examine both the health status *and* the opportunities for health of the respondents, the study is able to examine how capabilities and functionings interact.

⁷ These articles were found through searching key databases including Web of Science, Google Scholar, Sociological Abstracts and SocIndex. The search was done between January 2007 and June 2008. Key words used in various ways were: capability approach, capabilities, Sen, health, functionings, empirical. The articles found were then reviewed to see if they met the criteria of utilizing the capability approach and using health as either an independent variable or dependent variable. Seven articles met these criteria.

Table 2. Empirical Capabilities Review

Article	Data source	Health measures - operationalization	Analysis	Results regarding health
1. Anand et al. (2005)	2000/01 British Household Panel Survey (BHPS)	Having specific illnesses, self-reported satisfaction with health status	Variety of capability and functionings measures as IVs for predicting overall life satisfaction (seven point scale). Health was one of the IVs.	Poor health was a significant predictor in decreasing overall life satisfaction. Health problems that restricted activity were particularly detrimental.
2. Anand and van Hees (2006)	Random mail survey of all postal addresses in England (n = 273) designed to examine both functionings and capabilities	Self-reported "scope" to live a healthy life, perception of opportunities of other people in the community to live a healthy life, self-perceived health	Overall capabilities satisfaction used as the DV. Examined the relationship between personal capabilities and perception of others.	Being a member of the ethnic majority increased the likelihood of satisfaction with achieved health status. Personal health was not closely tied to perception of the health of others.
3. Klasen (2000)	1993 South African Labour and Demographic Research Unit (SALDRU) household survey	Type of health provider utilized for most recent illness	Expenditure based poverty measure as the IV. Composite measure of deprivation as the DV. Health was one of the measures in the index.	Lower access to health services in rural areas. Poorer "coloureds" and urban dwellers experienced better than expected access to health.
4. McGillivray (2005)	2002 UNDP Human Development Report	Undernourishment rates, underweight children and infants, adults with HIV/AIDS, women with HIV/AIDS, malaria cases, tuberculosis cases, cigarette consumption	Residual in country HDI scores not accounted for by income per capita as IV. Various measures used as DV (including a variety of the health status ones).	Health variables correlated similarly with both the residual and with per capita income.

Article	Data source	Health measures - operationalization	Analysis	Results regarding health
5. Mehrotra and Biggeri (2005)	Primary study carried out in 2000/01 on home-based work (HW) in India and Pakistan using household surveys, household focus groups and case studies	Number of health problems, health problems due to HW	Health status as a dependent measure. Variety of demographic, income measures, and work related measures as IVs. Other analyses used health status as IV in the study.	Women who engage in HW face specific detrimental health effects from the strain and repetitiveness of the jobs. However, the work also provides needed income for families. Increased safety measures would accentuate the positives.
6. Qizilbash and Clark (2005)	2001 SALDRU "The Essentials of Life" questionnaire	Type of health provider utilized for most recent illness.	Utilizes Klasen 2000 methodology but for a more recent South African survey. Combines with "fuzzy sets" poverty measurement to set different cut offs for defining those in poverty.	The composite measure of deprivation is improved by adding the fuzzy sets methodology. Those individuals with no access to health for their last illness are deprived regardless of their ranking on other measure of the index.
7. Zaida and Burchardt (2005)	1996/97 Family Resources Survey and the 1999/2000 BPHS	Presence of disability, severity of disability, spousal disability status, level and type of impairment	Income in different forms as the DVs. Disability and disability severity as IVs. Other IVs include demographics, other economic variables, poverty status.	Disability played a significant role in decreased income. Increasing severity lead to an effective decrease in income.

Notes: IV = independent variable, DV = dependent variable, HW = home-based work, HDI = Human Development Index

Research Questions

This project explores two interrelated questions. The first examines the Wilkinson hypothesis and is based on the work of Subramanian et al (2003): What is the relationship between income inequality and health in Chile? The second question draws on the ideas of Sen: What are the effects of income inequality on health capabilities and functionings in Chile? From these questions a handful of key hypotheses are drawn.

At the individual level of analysis, my first hypothesis (H_1) asserts that there is an absolute income effect on health, with individuals at the lower end of the income spectrum being more likely to experience poor health or poor health functionings. This would be in line with previous findings in Chile (Subramanian et al. 2003). My second hypothesis (H_2) asserts that individuals who have private health insurance are less likely to have poor health and more likely to have better access to health services (Barrientos 2000). A third hypothesis (H_3) is that those individuals in rural areas will have poorer health and also poor functionings outcomes for health (Barrientos 2000).

For the regional level of analysis, the central hypothesis (H_4) is that regions with higher income inequality will have a higher percentage of respondents with poor self-perceived health and poor health functionings (Subramanian et al. 2003; Wilkinson 1996). Next (H_5), regions with a higher percentage of respondents with public insurance are expected to have poorer health outcomes for functionings as well as self-perceived health (Barrientos 2000; Borzutzky 2006). Finally (H_6), it is hypothesized that those regions with a

higher percent of people living in rural settings will have worse health outcomes for both self-reported health and health functionings (Barrientos 2000; Borzutzky 2006).

CHAPTER 3: ROLE OF HISTORY AND POLITICAL ECONOMY IN CHILEAN HEALTH

An examination of the Chilean political economy in which income inequality and health are situated will help identify the context and structural factors that are important in this relationship. Using political economy to contextualize the relationship between income inequality and health is important because, as Coburn (2006) and Navarro (2002b) have pointed out, it is not sufficient to examine income inequality apart from the structural forces that influence it. Also, it would be improper to examine issues of access to health care without identifying economic factors that have an important effect on access. Though a complete examination of the political economy of health in Chile is beyond the scope of this project, centrally important factors will be highlighted including the role of dominant classes and state autonomy (Oppenheim 1993). With regard to political economy, the role of neoliberalism has been important for Chilean history, particularly since the military coup of 1973 that overthrew the Allende government. This coup, led by the armed forces of Chile, was backed and funded by the United States as part of the Cold War (Klein 2007; Oppenheim 1993; Stiglitz 2002). The ruling classes of Chile also played a key role in supporting and planning the coup (Sigmund 2000; Zeitlin and Ratcliff 1988). The coup led to significant changes in the government and economy, which had important effects on both health and inequality. Dominant neoliberal institutions, particularly the IMF and WB, also played a key role in affecting change. These

institutions seriously complicated the autonomy of Chile on issues of inequality and health by limiting policy choices (Hamilton 1982).

Also important was the role played by the ruling classes in affecting change in Chile. Zeitlin and Ratcliff (1988) argue that the election of Allende in 1970 was the greatest challenge the ruling class of Chile ever faced. The determination of those aligned with Allende to create a democratic path to socialism threatened the position of the families that controlled both the industrial and agricultural sectors. These classes had consistently been on the conservative end of the political spectrum but the election of Allende pushed them even further to the right (Rector 2003). Prominent families in the ruling class took part in the leadership of the right and also took part in the covert planning of both efforts to block Allende from taking power in 1970 and later in the coup that would overthrow his government (Zeitlin and Ratcliff 1988). Without the support of these important internal actors, the efforts of the U.S. and the multinational corporations could not have succeeded.

Underlying much of the analysis, but not tested empirically, are power and marginalization. Alternate explanations for the underlying reason for the coup abound in the literature. One perspective, which gives credence to external factors, argues that when Allende was in power in Chile he overstepped what was considered acceptable by the ruling class in the country, the military, international lenders, and institutions such as the IMF and WB (Zeitlin and Ratcliff 1988). As had happened before and has happened since (Roy 2004), those who felt their power reduced struck back and overthrew Allende and his

democratically elected government. A second perspective, argues that longstanding schisms in the UP coalition were exacerbated by factors related to both events in Chile (e.g. the 1972 financial crisis) and also ideological factors (e.g. the speed at which socialism was proceeding in Chile) (Hira 1998; Pollack and Rosenkranz 1986). The difficulty of achieving any significant economic consensus led to muddled policy that pleased none of the coalition partners and was tied to revolutionary rhetoric that concerned the opposition greatly (Loveman 2001; Oppenheim 1993). Also important was the presence and growth of armed leftist guerrillas, this led many in the center and on the right to favour the 1973 coup over waiting for the 1976 elections (Hira 1998).

The coup led to the creation of a government that chose to go along with the recommendations of international neoliberal institutions and the Chilean elite as opposed to listening to the Chilean public (Klein 2007; Rector 2003). The state under Pinochet was an extreme version of state autonomy (Hamilton 1982), only the dominant classes and their international backers and financiers were able to compete for favour and have their will enacted (Rector 2003). This continued until the electorate, who was marginalized under the coup, was able to coalesce, mostly peacefully, against the military dictatorship and vote Pinochet out of office (Oppenheim 1993).

While neoliberalism was imposed on Chile through violence and repression, the return to democracy has led to a more nuanced role of government in the economy. This change began with the 1982 crisis. The experience of the crisis led to a more pragmatic view of neoliberalism. Rather

than a continued adherence to a pure neoliberal model, a new set of economists charged with seeing Chile through the crisis began to see that economic policy had to be adjusted to the realities of Chile and to ensure its continued growth (Hira 1998). This pragmatism continued into the return to democracy, where there was a general consensus on a more moderate course of neoliberal policy. Most Chileans wanted to continue to have rapid growth, but also wanted the benefits of that growth spread more evenly than they were during the Pinochet era (Hira and Sanghera 2004; Oppenheim 2007; Rector 2003). This consensus was in part forged due to fears of further military intervention if the Concertación government went too far with reforms (Rector 2003).

With that background in mind, the political economy perspective put forth by Coburn (2006) provides a useful framework for this project. Coburn focuses on the linkages between health and social, political, and economic factors. Coburn terms his particular understanding of political economy as a materialist one because he focuses on the way that people live, as opposed to ideology, as the most important factor for analysis. For Coburn, the mode of production is extremely important. Capitalism, as the dominant mode of production, is seen as having a significant effect on health through the way in which capitalist society is organized (Coburn 2006; Marx 1963 (orig. 1859)). This interpretation follows Marx who argued, "The mode of production of material life determines the general character of the social, political and spiritual processes of life" (Marx 1963 (orig. 1859): 67). Under capitalism, Coburn argues, the owners of the means of production have a disproportionate amount of power and thus are

better able to impose their will. This allows them to reinforce their dominant position and de-emphasize the supposedly equalizing power effects of democracy (Coburn 2006).

Of particular importance for Coburn (2000) is the neoliberal ideology that has developed along with and reinforces capitalism, particularly since the 1970s. He notes that this ideology serves to justify unequal health opportunities and rationalizes this inequality as the result of individual choice and responsibility. This individual responsibility is important because it is used to justify the implementation of policies that decrease the range of services offered by governments (Coburn 2000; Stiglitz 2002).

In addition to examining the political economy of Chile, an examination of health and economic policies is also important. This discussion is divided into three sections: Pre-1973 health policy, post-1973 health policy changes, and post-Pinochet policy changes. Because of its enormous effect, the coup that brought General Augusto Pinochet to power in 1973 represents the beginning of important changes in the way health care came to be viewed by the government and the ruling class in Chile. The coup brought about significant and widespread changes in Chile (Rector 2003). With his rise to power a new era of public policy came into place (Oppenheim 1993). These new policy reforms were largely influenced by neoliberalism and were implemented by the Pinochet dictatorship without the approval of the people of Chile. The period of the dictatorship from 1973 to 1988 was a period of intense upheaval in the country in general and much of the change came from policies implemented by the state (Klein 2007).

Under the influence of the “Chicago Boys”, a group of University of Chicago trained economists, and also international organizations such as the IMF and WB, Chile became the test case for implementation of neoliberal policies (Oppenheim 1993; Silva 1991). This group of advisors provided advice that led to significant privatization of social institutions. They emphasized the market as the best way to regulate social services such as health care (Barrientos 2000).

One way in which the health care reforms can be examined is as a shift in the conceptualization of efficiency (De Vos et al. 2006). Different actors involved in Chile identified different goals for the health care system as the most important and attempted to pursue them. In the 1940s Chileans came to view efficiency in health as preventing and treating illnesses that were rampant among the poor as well as providing better care across Chile (Allende 1939; Barrientos and Lloyd-Sherlock 2000; Waitzkin 1981). In the Pinochet era, policies were implemented that reflected the Washington Consensus and many of the assumptions of neoliberalism. Fundamental to this is the idea of market efficiency. Under these assumptions, the state was assumed to be bloated by bureaucracy and that market reforms would bring about efficient change. It was believed that the government can significantly cut its costs while at the same time allowing higher quality access because market forces would be driving the system (Stiglitz 2002; Wermuth 2003). The policies pursued by post-Pinochet administrations came to view efficiency in terms of extending the provision of health care to Chileans who previously faced inadequate access. These final two approaches are not

mutually exclusive and many of the post-Pinochet administrations attempted to utilize aspects of both definitions of efficiency (Murray and Elston 2005).

Pre-1973 Health Policy Overview

Prior to 1952, the Chilean health care system lacked a national character and focus. Services provided in different areas were vastly unequal and many Chileans lacked access to basic care. Diseases like tuberculosis were still present among the poor, often going without treatment (Allende 1939). Many Chileans found this to be unacceptable and pushed for a more national system of care (Waitzkin 1981).

In 1952 the Servicio Nacional de Salud [National Health Service] (SNS) was founded and began to provide nearly universal coverage (Araya et al. 2006). It was created to oversee the general health of the country while providing direct care to many Chileans, particularly the poor and the working classes (Borzutzky 2006). By 1973 nearly seventy percent of the population was covered by the SNS, making it one of the most extensive health networks in Latin America (Borzutzky 2003; Borzutzky 2006; Oppenheim 2007).

Key to the post-1952 period was the idea that government had a key role to play in the health of its citizens. One key politician and doctor who helped push this perspective was Salvador Allende, first as a senator and later as the Minister of Health. Allende played a key role in the creation of the SNS during his time as a senator. He emphasized the role played by socio-economic factors in affecting health (Waitzkin 1981). Allende's dedication to health was only empowered by his election to the presidency of Chile in 1970. Health policies and health

infrastructure continued to be improved and attempts were made to extend care to marginalized sectors (Barrientos 2000).

Reforms in the Pinochet Era

The reforms following the overthrow of the Allende government represent a significant change in the type of governance in Chile. The changes implemented during this period still have significant repercussions for much of Chilean society today (Borzutzky 2006). With the government no longer accountable to the Chilean people, public policy was able to be created on a whim by those in power. Chile became the first Latin American country heavily influenced by neoliberalism, though many more would feel its effects beginning in the 1980s (Drake 2006). The rise to power of the Chicago trained economics team led to a reinterpretation of the role of the government in society (Oppenheim 1993; Silva 1991). Efficiency came to be defined not as expanding the quality and availability of care, as it was under Allende, but instead to minimize the cost of health to the government. Efficiency was viewed as something only the market could achieve (Barrientos 2000).

This emphasis on market efficiency led to privatization of many aspects of the Chilean economy including: some major copper mines, sections of health care, portions of social security, and other significant sectors (Rector 2003). However, the key copper mines in Chile were kept under government control. These reforms were carried out under the idea that it would make the different sectors more efficient and profitable, as well as unburdening the state. The

overall results of the policies overall have been mixed, though the implications for health have been significant (Barrientos 2000).

One of the most important reforms, with regard to health, was the introduction of private health insurance funds in 1981, known as *Institutos de Salud Previsional* (ISAPREs). These funds were fundamental in privatizing portions of the health care sector (Barrientos and Lloyd-Sherlock 2000). The reforms were modelled after the U.S. system of health maintenance organizations (HMOs). HMOs are private companies that provide care through monthly payments (often through an employer) and also co-pays and significant deductibles. The Chilean ISAPREs followed this model closely and began to advertise heavily to attract clients (Borzutzky 2006). In an effort to get the poor to join ISAPREs, the government provided a two-percent subsidy for low-income citizens. This led to detrimental effects where low-income Chileans were wooed into joining an ISAPRE by promises of particular care only to find out that those services required significant co-pays or were not in fact covered (Borzutzky 2006). The government rescinded this subsidy in 1998.

Another important reform was the choice given to workers of where to place their money. Of the seven percent contribution from wages that each worker makes in health insurance each year, the reforms allowed the individual to decide whether it would go to a private or public fund. Under this system, only those whose contribution to the system matched the likely payout risk would be allowed to pay into the private system, everyone else had to contribute to the public health system (Araya et al. 2006). This led to significant disparities in cost

between the public and private systems. Because only those individuals who were healthier were allowed into the private system, the public system had to assume the cost of those with serious health problems (Barrientos 2000). Also ISAPREs could drop individuals over age sixty-five, who then became the responsibility of the public system. This left the sick and the elderly to the care of the public system, reducing the effectiveness of the system overall (Barrientos 2000).

Borzutzky (2003) examined the effects of the privatization of social security in Chile. She concludes that the overall effect has been a negative one. Instead of making the public health system more solvent, it has led to significant budget deficits. The only beneficiaries of these reforms have been the insurance companies and private health care providers (Borzutzky 2003). These neoliberal reforms have been supported and recommended by the World Bank and International Monetary Fund (Stiglitz 2002).

Post-Pinochet Reforms

Many of the reforms implemented in the Pinochet regime were carried into the return to democracy (Borzutzky and Oppenheim 2006; Klein 2007; Oppenheim 2007). Even those policies that were changed still had many of the neoliberal assumptions that were present in their predecessors. By 1990 it was clear that inequality was rising quickly and that health status for many was worse under this new system (Atkinson et al. 2005). The privatization efforts, while largely upheld through the return to democracy in the 1990s, have been mitigated through an increased focus on establishing a more equitable

dispensation of health care (Atkinson et al. 2005). The incoming centre-left *Concertación de Partidos por la Democracia* [Coalition of Parties for Democracy] government, headed by Patricio Aylwin, came to power in 1990. *Concertación* grew out of the *Concertación de Partidos por el No* [Coalition of Parties to Vote “No”] which formed to block the continued rule of Pinochet by campaigning for Chileans to vote against Pinochet in the 1988 plebiscite (Rector 2003). The coalition government focused on improving the public health care system by increasing access and quality of the health care provided. It also emphasized expanding health care to rural areas and reaching out to marginalized populations (Barrientos 2000). While this new emphasis was different, it does not represent a fundamental change in the government’s approach to health care. Though market efficiency is no longer the main goal, it still plays a significant role in large part due to the foreign companies that have a major stake in the Chilean health care system (Gideon 2005).

The economic team that came into power under the new administration condemned the Pinochet era and argued that a “social debt” had been established. This social debt was the lack of adequate spending by the Pinochet government on issues of health, education, and housing (Sigmund 2000). A tax increase was implemented under the new administration in order to allow for spending on these issues. Between the years of 1990 and 1997 health spending increased by seventy-five percent as the new taxes allowed more discretionary spending. Despite this increased spending, there were still significant disparities between the public and private health systems (Sigmund 2000).

The health reforms in Chile have focused mostly on increasing preventative health measures and promoting better health for all of society (Atkinson et al. 2005). This has meant that little has been done to change the actual structure of the health care system. The decentralized nature of the system that was implemented under the Pinochet regime has been continued under later Chilean governments (Kubal 2006). While reforms were made to mitigate some of the inequalities created, they did little to change the continued disparities between the private and public sectors (Lister 2005). The serious divisions in wealth between those served by the public and private parts of the health care system continued as well (Hofter 2006). However, some positive reforms have also increased accountability and provided communities with increased agency to address health issues. The *Consejo Nacional para la Promoción de la Salud Vida Chile (Vida Chile)*, a partnership of public and private institutions has led to 98% of communities having a health promotion plan in place (Salinas et al. 2007). Another area where Chile has experienced significant success is in reducing the infant mortality rate from 136.2 per 1000 live births in 1950 to 8.9 in 2000 through focused intervention and public health campaigns (Jiménez and Romero 2007).

The reforms of the Pinochet government and subsequent reforms after the return to democracy have led to the public health system covering approximately sixty percent of the population. While the percentage covered is still relatively high, the level of care provided to the sixty percent who now have coverage is not as extensive as was given prior to 1973 (Borzutzky 2003). The public system

is split into four different groups: A, B, C, and D. Each of the groups provides care to a different set of Chileans, based on social position and income. Group A provides care to the poor, those on social assistance, and those receiving state pensions. Those families who make less than or equal to 135,000 pesos per year receive health care through Group B (approximately 600 pesos per U.S. dollar in 2003 and 2006) (Rector 2003). Families who earn more than 135,000 pesos but less than or equal to 197,100 pesos are placed in Group C. The families that earn more than 197,100 pesos are a part of group D (CASEN 2006c).

Social Cohesion and Health in Chile

From its time as the first developing country to receive a loan from the World Bank, Chile has received a lot of attention and been the subject of many studies (Escobar 1995). This review examines some of the key studies on Chile on factors relevant to this project⁸. It provides key links between the theoretical pathways argued by Wilkinson and the situation in Latin America generally and Chile more specifically.

Portes and Landolt (2000) argue that since 1973 social capital has declined throughout Latin America as a result of the rise of neoliberalism. This analysis supports recent research on international survey data from Latin America. Klesner (2007) found low levels of interpersonal trust in Latin America and moderate levels of political and volunteer involvement. In Chile, lower income status was a significant predictor for lack of political involvement. This

⁸ Articles were found using Web of Science, Google Scholar, Sociological Abstracts, and SocIndex. A variety of key words were used including: Chile, health, inequality, social capital, sociology, political economy.

was opposite of what was found for Argentina, Brazil, and Mexico, where lower income was associated with higher political involvement (Klesner 2007). Gideon (2005) notes that during the military dictatorship in Chile there were less opportunities for participatory action in the realm of health (Paley 2004). Social assistance targeted only at the very poor differs greatly from the collectivist notions of public policy that had been present prior to the 1973 coup (Gideon 2005).

Araya et al. (2006) explored the inequities in care by examining the relationship between mental health services and type of health insurance an individual has (private and public health care coverage). They conducted a study on mental health in Santiago using random stratified sampling and interviewed 3,780 participants. People in the public health system had the most severe mental health symptoms, measured by the Revised Clinical Interview Schedule (CIS-R). The CIS-R is a widely used structured interview for assessing mental health. Most importantly it was found that those in the public health system were the least likely to receive care compared to those in the private health system (OR = 2.72; 95% CI=1.6 - 4.6) (Araya et al. 2006). This inequality of services and need was also noted by Sapelli (2004). Sapelli found that individuals who chose private care were more often in better health. Those individuals in good health in the public system faced increased payments due to the higher risk of many individuals with public health insurance. This was in part due to the difficulty of someone with a prior health problem being accepted to an ISAPRE (Sapelli 2004).

Atkinson et al. (2005) examine political decision making on issues of policy implementation through a comparative case study model. Through examining a selection of health regions from both Chile and Brazil, they identify how urban and rural setting as well as complex versus basic provision of health care affected prevention and health promotion. They found that the flexibility of a decentralized health system had mixed effects on health promotion and prevention. They note that health promotion and prevention work was disproportionately biased towards urban settings. An example of the bias is that urban Chileans received increased access to dental services and social services that were not offered to those living in rural areas. The urban bias played a larger role in influencing health policy in Chile than in Brazil (Atkinson et al. 2005).

Trends in Chile

The presence of inequality has been consistent in Chile. Like much of Latin America, Chile has stark inequality and the Pinochet era only made the situation worse (see table 3). Only after the return to democracy did inequality decrease, however, not to the same levels as prior to the overthrow of democracy (Klein 2007; Oppenheim 1993).

The results for under-five mortality rate have been more positive. Under-five mortality rate gives the probability of death before age five per one thousand live births (Ahmad et al. 2000). It is a standard development measure (Hill and Pebley 1989). Chile has consistently improved on this measure from the 1950s. Unlike inequality, under-five mortality rate does not appear to have been negatively affected by reforms in the Pinochet era. The very low under-five

mortality rate is among the lowest in the world, only slightly higher than most OECD countries (UNDP 2007).

Finally, GDP per capita also rose from the 1970s onward. However, growth did slow after the economic crisis in Chile in the early 1980s (Rector 2003). During much of the period examined by this study, Chile experienced growth rates of between five and ten percent (IMF 2008). While there was consistent growth, as is noted elsewhere, the benefits of that growth were very unequal and those in the ruling classes received most of the benefits (Wermuth 2003)

Table 3. Inequality, Health, and Income: 1955-2006

Year	Gini Coefficient	Under-Five Mortality	GDP per capita (U.S. dollars)
1955-59	--	157‡	--
1960-64	--	147‡	--
1968	.46**	103‡ (1965-69)	--
1970	.43*	--	2,230*
1971	.46**	79‡ (1970-74)	--
1975-79	--	53‡	--
1980	.53**	35*, 33‡ (1980-84)	2,827‡
1982	--	--	2,148* 2,899‡
1985	--	--	3225‡
1987	.55‡	--	3,687‡
1989	.58**	25‡ (1985-89)	4,540‡
1990	.53‡, .57‡	21‡	4,806‡
1992	.54‡, .56‡	--	5,966‡
1993	--	--	3,020* 6,423‡
1994	.53‡, .57‡, .57**	17‡ (1990-94)	6,824‡
1996	.57‡	--	8,183‡
1997	--	11*	8,754‡
1998	.58‡	15‡ (1990-95)	9,017‡
2000	.58‡	--	9,479‡
2003	.52***, .57‡	--	10,713‡
2005	--	--	12,027‡ 12,346‡
2006	.49***, .54‡	9‡	13,083‡

Note: -- data not available, GDP (gross domestic product)

Sources: Gini: *(Muller 1995) †(Valdés 1999) ‡(CASEN 2006b) **(Schmidt-Hebbel 1999) ***this study (see chapter 5).

Under-five mortality: *(Wermuth 2003) †(UNICEF 2008) ‡(Ahmad et al. 2000)

GDP per capita: *(Albala and Vio 1995) † (IMF 2008) ‡(UNDP 2007)

The Effects of the IMF and WB on Policy in Chile

While the Pinochet regime and the “Chicago Boys” were responsible for the direct implementation of neoliberal reforms, the IMF and the World Bank have also played a significant role in influencing and shaping government policy in Chile. In 1948 Chile became the first developing country to receive a loan from the World Bank (Escobar 1995). This began a legacy of close ties between the

international system and Chile. Chile came to depend on the loans and other services that the IMF and WB provided (Rector 2003). In return for these loans and technical assistance, these institutions demand that certain policies are instituted, known as structural adjustment programs. For Chile, while some of the effects of the policies have been positive, there have also been significant negative effects, such as increased inequality (Klein 2007; Stiglitz 2002; Stiglitz and Charlton 2005).

Another impact of the IMF and WB came through providing policy guidance to Chile as it instituted reforms. The Pinochet regime came to be an adherent to ideas of the Washington Consensus, pushed by the IMF and WB (Klein 2007; Oppenheim 1993). The 1970s and 1980s were the time neoliberalism came to be dominant in Chile. Influential policymakers in groups such as the WB, IMF, and WTO all saw neoliberalism and its monetarist assumptions as being able to usher in a great worldwide wave of prosperity (Stiglitz 2002). This fascination with neoliberal reforms continued in a mitigated form into the 1990s as the WB increased its focus on health and public policy, advocating market measures as the most efficient way to govern issues of health (Homedes and Ugalde 2005). It has been noted that the influence of the WB has been increasing in areas of health, while the influence of other institutions (such as the Pan American Health Organization (PAHO)) have decreased (Abel and Lloyd-Sherlock 2000; Buse and Gwin 1998). The recommendations of the WB concerning health would eventually be published and increasingly advocated after the publication of the WB 1993 World Development Report "Investing in

Health.” Countries received increased pressure from the WB to privatize care and make their funding system more “efficient” (Buse and Gwin 1998; De Vos et al. 2006).

One significant example of the negative economic effects of taking on recommended neoliberal policies came in 1982 when Chile experienced a significant financial crisis. The crisis led to a nearly fourteen percent fall in GDP and a rise in the unemployment rate to twenty percent. This crisis came about, in part, as a result of enacting a free-market measure that didn't adequately protect Chile from out-flows of significant amounts of capital (Isbister 2003; Stiglitz 2002). This reform damaged the Chilean economy, but was theoretically sound according to the IMF. Another factor that played a role in the 1982 crisis was fixing the exchange rate, which led to severe problem as imports flooded the market (Hira 1998; Oppenheim 2007). This led to the need for currency devaluations, which pushed interest rates higher, reducing available domestic credit. The reduction in available credit decreased domestic investment in Chile, which also played a key role in the recession (Angell 1993). Despite this extremely negative experience in the 1980s, similar measures to those that caused the 1982 crisis are still being pushed as necessary for a strong economy (Stiglitz and Charlton 2005). These policies also helped to create the inequality that Chile currently experiences through harming those in marginal positions and weakening the social position of all but the wealthiest (Klein 2007). Portes and Hoffman (2003) argue that the much lauded gains in rising income made by Chile in the 1990s were spread extremely unequally and served to increase inequality

across the country. Informal workers, among the most marginalized class, earned an income that was, on average, four times lower than the poverty line (Portes and Hoffman 2003).

Chile, like other Latin American countries, has faced difficulties due to its acceptance of loans for development from the IMF and WB (Riveros 1998). In particular, Chile has experienced significant countervailing duties for trade (such as allowing imports of cheap goods from the United States and the European Union) as a result of getting a “subsidized” rate of repayment on its loans (Oppenheim 1993; Stiglitz and Charlton 2005). These countervailing duties actually serve to subsidize exporters such as the United States and the European Union that made the loans indirectly through the IMF and WB (Klein 2007). Also, the loans made to Chile under the Pinochet regime are still being paid off by the population today. These loans were given in response to enactment of structural adjustment programs (SAPs) that were put into place under a dictatorship. Some of the money from these loans was used to wage war on the people of Chile during the reign of Pinochet (Stiglitz 2006). This sort of debt is difficult to justify, particularly when much of it was squandered by a military dictatorship (Klein 2007; Levi et al. 2007; Vacs 2006) .

CHAPTER 4: METHODS

This chapter examines the empirical methods used to explore the research questions. The datasets used are discussed, including their comparability with the most recent census of Chile. In addition, the operational definitions of the concepts used in the study are examined. Finally, the statistical techniques used to analyze the data are discussed.

Description of the Data

In order to explore the research questions of this project – what is the relationship between income inequality and health in Chile and what are the effects of income inequality on health capabilities and functionings in Chile – a secondary analysis methodology is used. The data used in this study come from the *Encuesta de Caracterización Socioeconómica Nacional* [National Socio-Economic Characterization Survey] (CASEN), a nationally representative, cross-sectional survey carried out by the Department of Social Information of Chile every three years. It is utilized by the government of Chile to enact, modify, and adapt social and economic policy (CASEN 2003b). Two cycles of the CASEN survey are utilized in this project: 2003 (N = 257,077) and 2006 (N = 268,873). The data sets contain information about health, education, employment, and household information of individuals in Chile.

The CASEN used stratified random sampling techniques to derive the sample and collected information at the level of individuals, community, regional, and provinces. The data were then weighted to adjust for oversampling or undersampling of some groups, which is standard for large-scale data sets (CASEN 2006c; De Vaus 2002). Through comparison with the Chilean Census 2002 (INE 2002), the most recent census, an understanding of how representative the data sets are can be established. The weighted percentages from both the 2003 and 2006 closely resemble those from the most recent census on four key demographic variables (see table 4). This close correspondence between the census and the CASEN 2003 and 2006 increases the inferential power of the study (De Vaus 2002).

Table 4. Census Comparison

Variable	Census 2002 N	Census 2002	CASEN 2003*	CASEN 2006*
Gender				
Male	7,447,695	49.3	49.6	48.7
Female	7,668,740	50.7	50.4	51.3
Age				
0-14	3,733,759	24.7	25.6	23.3
15-59	9,508,237	62.9	63.1	63.7
60+	1,723,275	11.4	11.3	13.0
Marital Status**				
Married	6,983,793	46.2	47.4	43.8
Cohabiting	1,345,363	8.9	12.1	13.6
Annulled	60,466	0.4	0.3	0.2
Separated/divorced	710,472	4.7	5.7	6.2
Widowed	786,055	5.2	5.5	0.6
Single	5,230,287	34.6	29.1	30.3
Urban/Rural				
Urban	13,090,833	86.6	86.9	87.2
Rural	2,025,602	13.4	13.1	12.9
N	15,116,435		257,077	268,873

*weighted percentages presented **Marital status reported for those 18+ (N=174,756/189,758) CASEN 2003/2006 respectively

Measures

Some questions in the data sets vary slightly from year to year but are generally consistent. The 2003 and 2006 versions of the data set were selected for a variety of reasons. One of the central factors for the inclusion of the 2003 data set was a self-reported health question that had the respondents rate themselves on a five point scale: excellent, very good, good, fair, and poor. This question was also included in the 2000 version of the data set and was the central dependent variable used by Subramanian et al. (2003) in their study of

income inequality and health. The 2006 version of CASEN did not contain this measure and so analysis of the 2003 CASEN was necessary in order to examine the relationship between self-reported health status and income inequality. Also important, as noted previously, is that self-reported health has been one of the dominant methods for testing the Wilkinson hypothesis. While the reliability of self-reported health has been questioned previously (De Maio 2007a; Sen 2002), it is still one of the most fundamental operationalizations used for health in the empirical literature (Lynch et al. 2004; Wilkinson and Pickett 2006). Consistent with previous studies, self-assessed health was dichotomously coded to very good, good, and regular as one category and poor and very poor as the second.

Income inequality is operationalized through two key measures. This was done in order to examine how different operationalizations of inequality affect the relationship between income inequality and health. The two inequality measures used are the Gini coefficient (see Subramanian et al. 2003) and the generalized entropy (GE) index (see De Maio 2007b). The Gini coefficient is the most widely used measure for income inequality. It best measures inequality in the middle of the income spectrum. The Gini coefficient ranges from zero, a perfectly equal society, to one, perfectly unequal society where one individual earns all of the income (De Maio 2007b; Wilkinson 2005).

The GE index is actually four measures that are sensitive to income inequality at different income levels. The four indexes are: GE(2), GE(1), GE(0), and GE(-1). GE(2) is most sensitive to inequality at the top of the income spectrum while GE(-1) is most sensitive to inequality at the bottom of the income

distribution. GE(1) and GE(0) are sensitive to inequalities at the upper-middle and lower-middle of the income spectrum, respectively. A GE of zero represents perfect equality in income distribution and values higher than zero indicate an unequal society (De Maio 2007b; Jenkins 1991). Both the Gini and the GE were calculated using Stata's *ineqdeco* command.

For the analysis of the effects of income inequality on capabilities and functionings, the most recent data set (CASEN 2006) was used. Different health functionings are operationalized through identifying outcomes on three central aspects of health (see table 5 for a brief description and references to relevant studies). In the CASEN data set there were a variety of measures that can be used to operationalize functionings. The measures chosen were the presence of a recent health problem (in the past 30 days), utilization of health care (did not receive at least once consultation in the past three months), and unmet needs (needed care but did not receive it for a health problem in the past 30 days).

Table 5. Ideal Functionings Measures and Questions from CASEN 2006

Ideal Measure	Empirical Use	CASEN 2006
Utilization of services	Hofter (2006)	How many times in the past three months did you consult a general practitioner, a specialist, a dentist, receive emergency care, receive mental health care (utilization of at least one in the past 3 months)
Unmet needs	Nelson and Park (2006)	Why did you not receive care for your recent health problem?
Recent health problem	Karademas et al. (2008)	Have you had a health problem in the past thirty days?

Poverty was operationalized in the CASEN data set as lacking the necessary income to purchase a basket of goods to meet a basic level of subsistence (CASEN 2003a; CASEN 2006a). This method of measuring poverty is also used widely in the United States (Haveman and Wolff 2004). If income is low enough that not even basic food could be afforded then the individual/household is below the destitution line. For urban areas, the poverty line is defined as twice the destitution line. For rural areas, it is calculated as seventy-five percent of the core budget of food in the area. Those who are destitute have been collapsed with those in poverty so that the analysis differentiates only between those above and below the poverty line. The poverty line for the CASEN 2003 is 43,712 pesos for urban areas and 29,473 pesos for rural. For CASEN 2006 the poverty line is 47,099 pesos for urban respondents and 31,356 pesos for those that reside in a rural area (CASEN 2006a).

Data Analysis

Only respondents aged eighteen and older are included in this study. Analysis for the project was carried out both at the individual level and aggregated to the regional level. Univariate, bivariate, and multivariate techniques were utilized for the individual-level data. For the regional level, only univariate and bivariate techniques were used due to the small number of regions (this prohibits the use of multivariate techniques). The regional analysis

examines the 13 administrative regions of Chile (see figure 1)⁹. All analysis was carried out using Stata 9.

For univariate analysis of the individual-level data, the modal category is highlighted for each variable in tables 6-7 and 13-15. For the bivariate level, individual data cross-tabulations with chi-square were utilized to ascertain statistical significance¹⁰. Finally, logistic regression was used to model the relationships between the independent variables and the dependent variables. The first model (model 1) in each logistic regression is an unadjusted model and gives an account of each independent variable on the dependent variable. The models are then built up by adding one additional independent variable at a time until the final, fully adjusted model (model 7) is presented.

For understanding the results of the logistic regressions, odds ratios above 1.00 should be interpreted as increasing the likelihood of experiencing the specific outcome on that dependent variable (e.g. likelihood of reporting poor or very poor health). For example, an odds ratio of 2.50 for women, in comparison to men as the reference group, on poor health would indicate that women are 2.5 times more likely than men to report experiencing poor health. Confidence intervals are used to identify significance in the logistic regression. If the confidence interval spans 1.00 (e.g. 0.87 - 1.25) then the finding is not statistically significant. However, if the values of the confidence interval are on

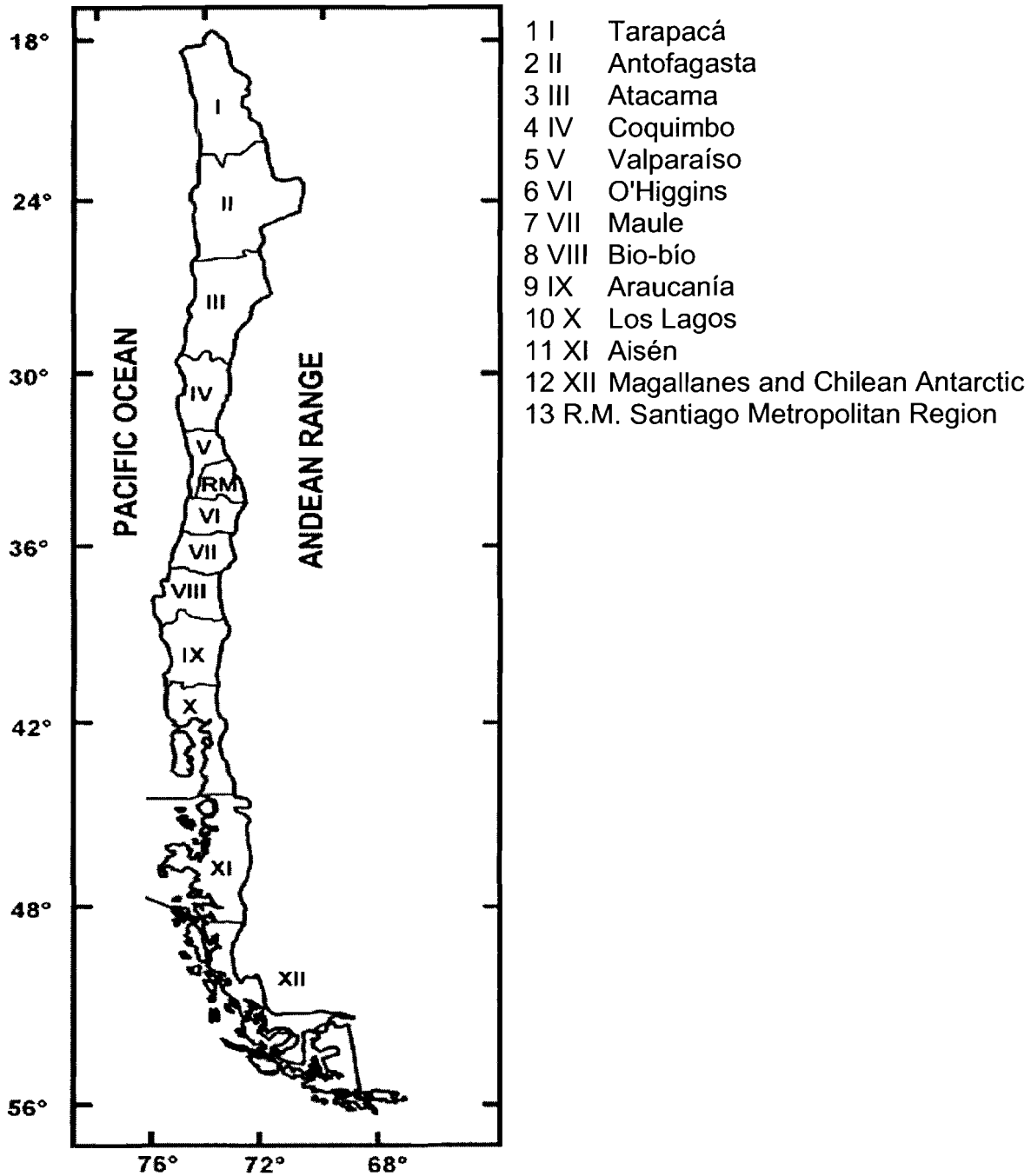
⁹ As of December 2006 two new administrative regions were added to Chile. They were added by breaking up two current regions into separate administrative districts. For comparability of analysis between the 2003 CASEN and 2006 CASEN the two regions will remain collapsed with their original regions.

¹⁰ Statistical significance gives the likelihood that a particular finding would be replicated in the population from which the sample was drawn. A significance level of 0.05 means that there is a five percent chance that the result in the sample is just due to chance and would not be found in the population (De Vaus 2002).

the same side of 1.00 (e.g. 0.56 - 0.72 or 1.49 - 2.53), then the value is significant at least at the .05 level (Gilbert 1993; Wright 1995).

The regional level univariate results present the mean age and education level and the percentages for key factors. The overall average for the country itself is also presented. The regional bivariate analysis was carried out using Pearson correlation matrices. The correlations present the strength and direction of the linear relationship between the key variables. Significance is also provided in the correlation matrices (De Vaus 2002).

Figure 1. Regions of Chile



CHAPTER 5: RESULTS

Absolute Income Effect

The weighted descriptive results for the 174,810 respondents aged 18 years or over of the CASEN 2003 dataset are presented below in tables 6 and 7. Women make up a slight majority (52.2%) of the respondents. Those age thirty-five to forty-four make up the largest age group (22.1%) in the survey. Married was the modal response for marital status with nearly half of adults (47.4%). Nearly one-third (29.1%) of participants were single. Close to half of the respondents (42.5%) had at least some secondary education. A vast majority of Chileans (87.0%) live in an urban setting¹¹.

¹¹ Urban status was defined in the CASEN 2003 and 2006 as a concentration of housing with a population over 2000 respondents or between 2000 and 1001 people if more than fifty percent of the economically active population is involved in secondary or tertiary activities (such as work or higher education). An area was defined as rural if it had a population below 1000 or between 2000 and 1001 but with less than fifty percent involved in secondary or tertiary activities (CASEN 2003a; CASEN 2006a).

Table 6. CASEN 2003 Demographic Variables

Variable	N	Unweighted %	Weighted %
Demographic Characteristics			
Gender	174,810		
Male	85,407	48.9	47.8
Female*	89,403	51.1	52.2
Age	174,810		
18-24	29,227	16.7	17.6
25-34	35,899	20.5	21.6
35-44*	38,167	21.8	22.1
45-54	28,230	16.2	16.5
55-64	20,014	11.5	10.8
65+	23,273	13.3	11.5
Marital Status	174,756		
Married*	83,211	47.6	47.4
Cohabiting	22,147	12.7	12.1
Annulled	218	0.1	0.2
Legally Separated	4,133	2.4	2.7
Separated Without a Court Order	4,089	2.3	3.0
Widowed	10,474	6.0	5.5
Single	50,484	28.9	29.1
Education	174,243		
None (0 years)	9,345	5.4	3.1
Primary (1-8 years)	76,957	44.2	30.6
Secondary (9-12 years)*	63,765	36.6	42.5
Tertiary (13+ years)	24,176	13.9	23.9
Urban/Rural	174,810		
Urban*	108,936	62.3	87.0
Rural	65,874	37.7	13.0
Income Quintile (NPC)	174,108		
1 Lower	50,786	29.2	19.5
2 Lower-Middle*	41,890	24.1	21.0
3 Middle	34,548	19.8	20.8
4 Upper-Middle	27,311	15.7	20.4
5 Upper	19,573	11.2	18.3
Poor	174,226		
Poor	33,280	19.1	15.0
Not Poor*	140,946	80.9	85.0

Note: * denotes modal category, NPC = Based on a national comparison of household income per capita

The health data are interesting in that overwhelmingly (70.9%) Chileans are enrolled in the public health care system. A slight majority of Chileans (51.1%) identify having good health, while 7.7% report having poor or very poor health. These results are very similar to those found by Subramanian et al (2003) with 52% reporting good health in their study and 8.7% reporting poor or very poor health.

Table 7. CASEN 2003 Health Variables

Variable	N	Unweighted %	Weighted %
Health Characteristics			
System of Health Insurance	172,984		
Public System Group A*	66,034	38.2	25.9
Public System Group B	44,999	26.0	24.2
Public System Group C	16,102	9.3	11.1
Public System Group D	11,257	6.5	8.6
Public System (Doesn't know which group)	1,375	0.8	1.1
FF.AA and of Order	3,345	1.9	3.3
ISAPRE	15,402	8.9	16.8
None (individual)	14,221	8.2	8.7
Other system	249	0.1	0.2
Self-assessed health	92,285		
Very Good	7,840	8.5	12.3
Good*	44,532	48.3	51.1
Regular	31,598	34.2	28.9
Poor	7,349	8.0	6.6
Very Poor	966	1.1	1.1

* denotes modal category

Table 8 presents the bivariate findings for selected factors and self-perceived health dichotomously coded. Women were slightly more likely than

men to experience poor or very poor self-reported health (8.8% and 5.8%, respectively) ($\chi^2=83.8$, $p<0.001$). As expected, a gradient¹² effect was found for age: those who were older were more likely to report poorer health than those who were younger ($\chi^2=250.4$, $p<0.001$). As would be expected those with higher educational attainment were less likely to report poor health ($\chi^2=324.3$, $p<0.001$). Surprisingly, those with no health insurance, overall, reported better self-perceived health than those with public insurance (4.7% versus 9.3%, respectively) ($\chi^2=82.1$, $p<0.001$)¹³. Those with private (ISAPRE) insurance were the least likely to report poor self-perceived health with only 2.4% reporting so. This key finding will be examined closely in the discussion section. These findings were similar to those reported in previous work on Chile (Subramanian et al. 2003) and also to a recent multilevel study in Argentina (De Maio 2007a).

¹² A social gradient refers to a finding that shows an effect in one direction across the social categories being examined (see Subramanian 2003). In this case, the gradient went from young to old, with increases for every age category and those respondents 65 and older being the most likely to report poor health.

¹³ Interestingly those with no insurance were a complex set of respondents. They had higher educational attainment than those with public insurance but lower than those with private. Also, respondents with public insurance were mostly found among the lower income quintiles and those participants with private insurance were generally in the higher income quintiles. The respondents with no insurance were spread evenly across the income spectrum. It is difficult to generalize about this particular group.

Table 8. CASEN 2003 Self-Perceived Health by Select Factors

	% Excellent, Very Good, and Fair Health	% Poor or Very Poor Health	N	Chi-Square	Significance
Sex			92,285	$\chi^2 = 83.8$	p < 0.001
Male	94.2%	5.8%			
Female	91.2%	8.8%			
Age			92,285	$\chi^2 = 250.4$	p < 0.001
18-24	98.0%	2.0%			
25-34	97.8%	2.2%			
35-44	95.3%	4.8%			
45-54	90.8%	9.3%			
55-64	85.7%	14.3%			
65+	81.6%	18.5%			
Education			92,064	$\chi^2 = 324.3$	p < 0.001
None	76.3%	23.7%			
Primary	87.8%	12.3%			
Secondary	94.5%	5.5%			
Tertiary	97.7%	2.3%			
Health System			91,974	$\chi^2 = 82.1$	p < 0.001
Public	90.7%	9.3%			
Private	97.6%	2.4%			
None	95.3%	4.7%			
Other	94.8%	5.2%			
Income Quintile (National Per Capita)			91,989	$\chi^2 = 66.0$	p < 0.001
1	88.6%	11.4%			
2	91.4%	8.6%			
3	91.4%	8.6%			
4	94.0%	6.0%			
5	96.4%	3.6%			
Urban/Rural			92,285	$\chi^2 = 68.6$	p < 0.001
Urban	92.6%	7.4%			
Rural	90.2%	9.8%			
Marital Status			92,256	$\chi^2 = 155.0$	p < 0.001
Married/Cohabiting	92.6%	7.4%			
Separated/Widowed/ Annulled	86.3%	13.7%			
Single	95.3%	4.7%			

	% Excellent, Very Good, and Fair Health	% Poor or Very Poor Health	N	Chi-Square	Significance
Below the Poverty Line			92,065	$\chi^2 = 69.9$	$p < 0.001$
Poor	89.5	10.5			
Not Poor	92.7	7.3			

Note: Row percentages are shown. Percentages may not add up to 100% due to rounding.

The results of the logistic regression are presented in table 9. Most interesting is the consistent and statistically significant health gradient across income quintiles. The relationship becomes further specified and remains significant throughout the models. In the unadjusted model (model 1), the lowest income quintile and the lower-middle quintile have nearly identical chance of being in poor health. This relationship becomes clearer over the course of the models until a clear gradient is found.

Those respondents with no health insurance are no more likely than those with private insurance to report having poor self-perceived health in the fully adjusted model (model 7). However, in the unadjusted model (model 1) respondents with no insurance were twice as likely (O.R. = 2.01) to report poor health. Respondents with public insurance were nearly two times more likely to report poor health (O.R. = 1.74) in the fully adjusted model and over four times as likely to report poor health in the unadjusted model (O.R. = 4.19). Also, in the fully adjusted model, respondents living in a rural area were actually *less* likely to report being in poor health, contrary to findings in model 1 and also what was hypothesized. A clear age gradient was also found in the multivariate results, with younger respondents being less likely to report poor health.

Table 9. Likelihood to be in Poor Health by Selected Factors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Income Quintile							
Highest	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.72 (1.40-2.13)	1.33 (1.07-1.66)	1.31 (1.05-1.64)	1.44 (1.15-1.81)	1.30 (1.03-1.64)	1.30 (1.04-1.64)	1.30 (1.03-1.63)
3	2.53 (2.10-3.06)	1.74 (1.42-2.13)	1.70 (1.39-2.07)	1.89 (1.54-2.33)	1.62 (1.31-2.01)	1.62 (1.30-2.01)	1.62 (1.30-2.01)
4	2.54 (2.11-3.05)	1.68 (1.38-2.05)	1.62 (1.32-1.97)	2.11 (1.72-2.61)	1.75 (1.41-2.17)	1.75 (1.41-2.18)	1.76 (1.42-2.19)
Lowest	3.47 (2.90-4.16)	2.23 (1.83-2.72)	2.13 (1.75-2.60)	2.96 (2.40-3.64)	2.35 (1.89-2.92)	2.35 (1.89-2.93)	2.40 (1.93-2.99)
Health Insurance							
Private	1.00	1.00	1.00	1.00	1.00	1.00	1.00
None	2.01 (1.46-2.76)	1.64 (1.18-2.26)	1.71 (1.23-2.36)	1.50 (1.07-2.10)	1.31 (0.93-1.84)	1.30 (0.92-1.82)	1.30 (0.93-1.84)
Public	4.19 (3.39-5.17)	3.09 (2.45-3.89)	3.06 (2.43-3.86)	2.03 (1.60-2.57)	1.73 (1.35-2.22)	1.73 (1.35-2.21)	1.74 (1.36-2.23)
Other	2.23 (1.59-3.12)	2.00 (1.42-2.82)	2.00 (1.42-2.81)	1.20 (0.85-1.70)	1.10 (0.78-1.56)	1.10 (0.78-1.56)	1.10 (0.78-1.55)
Gender							
Male	1.00		1.00	1.00	1.00	1.00	1.00
Female	1.57 (1.43-1.74)		1.42 (1.28-1.56)	1.52 (1.37-1.70)	1.50 (1.35-1.66)	1.49 (1.34-1.65)	1.47 (1.33-1.64)
Age							
18-24	1.00			1.00	1.00	1.00	1.00
25-34	1.06 (0.75-1.50)			1.03 (0.73-1.47)	1.00 (0.71-1.43)	1.03 (0.72-1.47)	1.03 (0.72-1.47)
35-44	2.40 (1.72-3.34)			2.27 (1.63-3.17)	2.10 (1.51-2.93)	2.16 (1.53-3.03)	2.15 (1.53-3.02)
45-54	4.90 (3.56-6.74)			4.95 (3.59-6.83)	4.35 (3.14-6.02)	4.46 (3.19-6.23)	4.45 (3.18-6.23)
55-64	8.01 (5.83-11.00)			8.12 (5.90-11.19)	6.60 (4.76-9.15)	6.73 (4.80-9.45)	6.70 (4.78-9.41)
65+	10.87 (7.95-14.86)			10.74 (7.84-14.70)	8.26 (5.98-9.15)	8.37 (5.99-11.70)	8.33 (5.96-11.65)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education							
Tertiary	1.00				1.00	1.00	1.00
Secondary	2.45 (1.98-3.03)				1.43 (1.14-1.81)	1.44 (1.14-1.82)	1.44 (1.14-1.82)
Primary	5.90 (4.82-7.21)				1.77 (1.40-2.25)	1.78 (1.40-2.26)	1.84 (1.44-2.34)
None	13.13 (10.49-16.43)				2.66 (2.04-3.47)	2.66 (2.04-3.48)	2.81 (2.15-3.69)
Marital Status							
Single	1.00					1.00	1.00
Married/ Cohabiting	1.62 (1.43-1.84)					0.95 (0.83-1.09)	0.95 (0.83-1.09)
Separated /Widowed /Annulled	3.21 (2.78-3.69)					0.99 (0.85-1.15)	0.98 (0.84-1.14)
Urban/Rural							
Urban	1.00						1.00
Rural	1.35 (1.26-1.45)						0.83 (0.77-0.90)
N	91,435-91,681	91,681	91,681	91,681	91,462	91,435	91,435
Model significance	All significant at .001	.001	.001	.001	.001	.001	.001

Wilkinson's Income Inequality Hypothesis

The descriptive analysis of the 13 key regions of Chile is presented in tables 10 and 11. The Metropolitan Santiago region dominates the country in terms of population, containing just over 41% of the sample, very close to the 42.3% found in the 2002 Chilean census (INE 2002). The percent in poor or very poor health ranges from a high of 11.4% in the Maule region to a low of 5.7% in the Aisén region (one of the two smallest regions in Chile). Most regions fall between 7.3% and 9.0%, including Santiago at 7.6%.

The national Gini coefficient of .52 places the country as among the highest in Latin America and the world (ECLAC 2006; Hoffman and Centeno 2003; UNDP 2007). This aggregated Gini hides a great amount of disparity across different Chileans regions. Santiago has the highest in the country at .57 while the lowest is .42 in the O'Higgins region. Even the lower levels of inequality are still high relative to other countries, such as the United States at .40, the United Kingdom at .36, and Canada at .33 (UNDP 2007).

The percent covered by the public health care system also varies widely from region to region with highest being the Araucanía region with 88.6% and the lowest being Magallanes and Chilean Antarctic, the smallest region in Chile, with 60.57%. Eight out of the 13 regions have between 80.7% and 88.6% of their population enrolled in the public health care system. The exceptional regions, besides the Magallanes and Chilean Antarctic region, are Antofagasta (69.6%), Aisén (70.8%), and the Metropolitan Santiago region (68.6%).

The mean education level ranges from Santiago with 10.3 years of education to Araucanía and Maule with 7.6 years. The region with the highest percentage of people with no formal education is Tarapacá with 8.0% and the lowest is Magallanes and the Chilean Antarctic with 1.6%.

Two related measures, the percent that had a health problem within the last thirty days and the percent that did not get a consultation for that health problem, present interesting findings. The region that is highest on both, Coquimbo represents an anomalous case with 29.5% of people having a health problem and over half (55.3%) not receiving a consultation for that health problem. Those in the Valparaíso region were the least likely to have a health problem (9.9%). The Atacama region was the lowest on not getting a consultation with 13.7 percent.

The median total household income of the regions varied widely from a high of 443,345 pesos in Antofagasta to a low of 221,261 pesos in Araucanía. The percent below the poverty line varied widely as well from Araucanía with nearly one-third (29.2%) of its inhabitants below the poverty line to the Magallanes and Chilean Antarctic region with 9.2 percent of the population below the poverty line. By far the most urban region is Metropolitan Santiago with 85.7 percent of the population living in an urban area. The least urbanized region is the Maule region with only 43.4 percent living in an urban setting.

Interestingly the two regions that surround the metropolitan Santiago region, Valparaíso to the north and O'Higgins to the south have some of the lowest Gini coefficients, .43 and .42 respectively; while Santiago has the highest

in Chile at .57. Three contiguous regions in south central Chile stand out on some of the measures as having poorer outcomes, Maule, Bio-Bío, and Araucanía. They have a higher percent reporting poor health, 11.4, 10.2, and 11.2 respectively, than the national average of 9.0. They are also the three lowest on median household income. These three regions have some of highest percentages of individuals below the poverty line, particularly Bio-Bío, at 27.4, and Araucanía, at 29.2. These results are much higher than the national average of 19.1 percent.

Table 10. Regional Descriptive Variables

Region	N, un-weighted (%)	% Weighted	Population 2003 CASEN Estimate	% Poor or Very Poor Health	Gini coefficient	Percent with Public Health Care	Mean Education (in years)	% with no Education	Mean Age (in years)	% age 65+	% that had a Health Problem
I Tarapacá	5,202 (3.0%)	2.7	290,581	7.3	.46	79.2%	8.5	8.0	42.6	13.9	13.5
II Antofagasta	4,680 (2.7%)	3.2	339,848	7.7	.44	69.6%	9.7	3.8	40.8	10.5	13.8
III Atacama	4,772 (2.7%)	1.6	172,525	7.8	.45	80.7%	8.9	5.7	41.7	11.4	10.6
IV Coquimbo	8,024 (4.6%)	4.0	429,322	8.9	.48	86.6%	8.2	7.4	43.0	15.0	29.5
V Valparaíso	19,405 (11.1%)	10.3	1,109,773	8.1	.43	81.5%	9.3	3.6	43.2	14.1	9.9
VI O'Higgins	8,491 (4.9%)	5.3	567,387	9.4	.42	81.6%	8.4	5.6	42.5	12.8	11.8
VII Maule	16,614 (9.5%)	6.0	643,295	11.4	.46	86.5%	7.6	7.4	43.1	14.0	13.0
VIII Bio-Bío	29,503 (16.9%)	12.2	1,311,333	10.2	.48	88.1%	8.0	6.6	43.0	13.4	11.9
IX Araucanía	16,620 (9.5%)	5.6	599,515	11.2	.49	88.6%	7.6	7.9	43.3	14.9	12.0
X Los Lagos	20,971 (12.0%)	6.8	733,427	8.4	.46	83.6%	7.7	5.0	43.3	14.2	11.2
XI Aisen	2,151 (1.2%)	0.6	61,451	5.7	.48	70.8%	8.1	7.9	42.3	12.0	10.1
XII Magallanes and Chilean Antarctic	1,862 (1.1%)	0.9	101,525	6.0	.52	60.5%	9.2	1.6	44.5	15.5	11.4
R.M. Santiago Metropolitan Region	36,515 (20.9%)	41.0	4,410,446	7.6	.57	68.6%	10.3	2.8	41.8	11.5	10.6
Total	174,810 (100.00%)	100.0	10,770,428	9.0	.52	80.8%	9.1	5.4	42.4	13.3	12.3

Table 11. (continued) Regional Descriptive Variables

Region	% that did not get a consultation for their Health Problem	Median Income (2003 Chilean Peso)	Percent Urban	Percent Below the Poverty Line
I Tarapacá	30.3	269,470	48.0	20.5
II Antofagasta	32.5	443,345	68.6	9.8
III Atacama	13.7	304,859	65.3	17.2
IV Coquimbo	55.3	257,914	49.7	20.3
V Valparaíso	17.5	315,466	77.1	16.5
VI O'Higgins	19.6	295,384	62.6	15.4
VII Maule	26.9	250,161	43.4	19.1
VIII Bio-Bío	23.6	229,078	58.4	27.4
IX Araucanía	31.2	221,261	49.2	29.2
X Los Lagos	31.7	256,158	45.6	19.2
XI Aisén	22.1	334,648	56.4	11.4
XII Magallanes and Chilean Antarctic	22.2	395,490	62.2	9.2
R.M. Santiago Metropolitan Region	24.1	413,366	85.7	12.0
Total	28.6	377,950	62.3	19.1

The regional bivariate table (table 12) utilizes a matrix to display the correlations between the variables from the regional univariate analysis. In this table, the key relationships for testing the Wilkinson model can be interpreted. One key finding of the table is the lack of a statistically significant relationship between the regional Gini coefficients and the percent that reported being in poor or very poor health. This indicates a lack of support for the Wilkinson hypothesis. This is counter to what was found by Subramanian et al. (2003) using multilevel analysis. In fact, the Gini variable is significant only with four other variables: mean education level, median income, percent urban, and public insurance. The first three all have strong positive relationships ($r = 0.74, 0.71, \text{ and } 0.70$, respectively; $p < 0.01$). Those regions with higher levels of education, high median income, and high urbanization rates also have higher inequality. The percent with public insurance has a strong negative relationship with the regional Gini coefficient ($r = -0.75, p < 0.01$), meaning regions of higher inequality have a lower percentage of respondents with public health care.

A key dependent variable in the project is the percent reporting poor health. It has a statistically significant relationship with the percent with public insurance ($r = 0.82, p < 0.001$), mean education level ($r = -0.79, p < 0.01$), median income ($r = -0.81, p < 0.001$), percent urban ($r = -0.71, p < 0.01$), and percent below the poverty line ($r = 0.81, p < 0.001$). Of interest is that the percent in poor health is not significantly correlated with the percent that had a health problem. At the regional level, those with higher percentages of people that had a health problem were no more likely to have a higher percentage of people

reporting poor health. This may indicate that the percentage with a recent health problem is not accounting for chronic conditions or other long-term illness not characterized by sudden symptoms.

Table 12. CASEN 2003 Regional Correlation Matrix (r values)

	Public insurance	Regional Gini	Poor Health	Mean age	Age 65+	Mean Education	No education	Median income	Health Problem	No health consult	Urban	Poverty Line	GE (-1)	GE (0)	GE (1)	GE (2)
Public insurance	1.00															
Regional Gini	-.76†	1.00														
Poor Health	.83‡	-.47	1.00													
Mean age	.80†	-.65	.58*	1.00												
Age 65+	.82‡	-.67	.59*	.96‡	1.00											
Mean Education	-.92‡	-.73‡	-.79‡	-.80‡	-.82‡	1.00										
No education	.87‡	-.61*	.79‡	.61*	.70‡	-.91‡	1.00									
Median income	-.98‡	.71†	.20	-.85‡	-.86‡	.96‡	-.90‡	1.00								
Health Problem	.33	-.20	.20	.19	.38	-.32	.46	-.30	1.00							
No health consult	.23	-.02	.16	.13	.33	-.32	.41	-.24	.88‡	1.00						
Urban	-.84‡	.70†	-.71†	-.72†	-.78†	.97‡	-.90‡	.89‡	-.42	-.46	1.00					
Poverty Line	.90‡	-.49	.81‡	.71**	.72†	-.83‡	.84‡	-.92‡	.23	.21	-.74†	1.00				
GE (-1)	-.83‡	.97‡	-.56*	-.78†	-.80‡	.80‡	-.65*	.79†	-.26	-.12	.76†	-.57*	1.00			
GE (0)	-.78†	1.0‡	-.49	-.67*	-.70†	.76†	-.63*	.74†	-.22	-.06	.72†	-.52	.98‡	1.00		
GE (1)	-.75†	1.0‡	-.43	-.64*	-.66*	.73†	-.61*	.71†	-.16	.00	.70†	-.48	.95‡	.99‡	1.00	
GE (2)	-.71†	.98‡	-.38	-.62*	-.63*	.71†	-.57*	.68*	-.11	.04	.68†	-.43	.94‡	.98‡	.99‡	1.00

* .05 † .01 ‡ .001

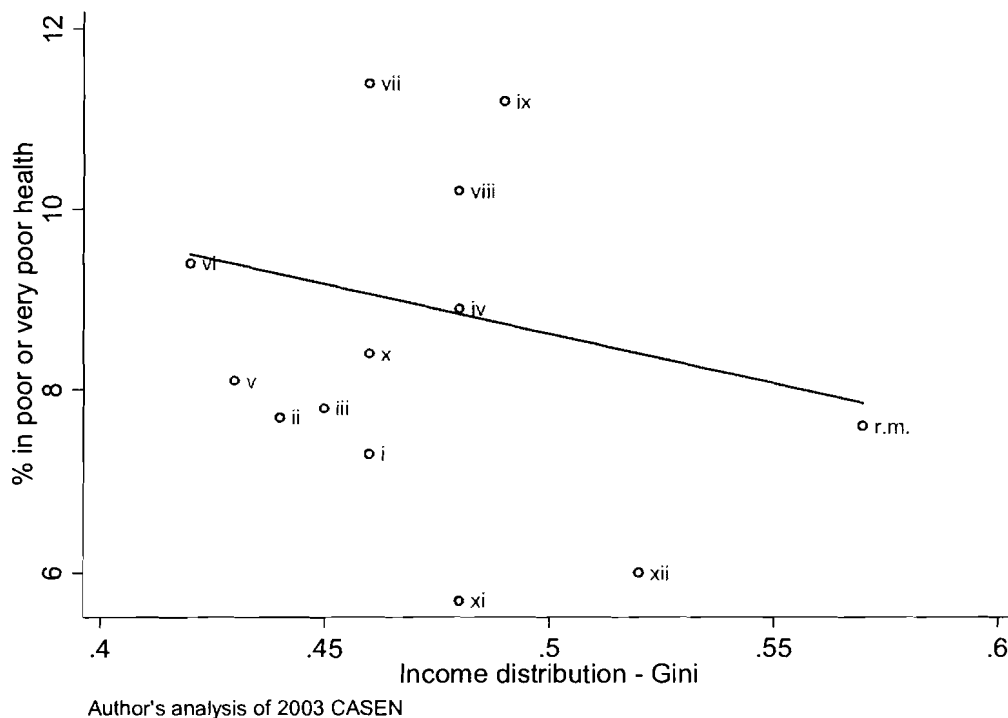
Scatterplots are often used to aid in the interpretation of correlation matrixes. In this case, they bring our attention to the anomalous position of Santiago. When Santiago is included in the model (figure 2), a moderate negative relationship is found with a coefficient of -0.47 ($p = .11$, not statistically significant) between income distribution, in this case the Gini coefficient, and percent in poor or very poor health. Santiago has the highest level of inequality in the country but also among the lowest levels of respondents reporting poor or very poor health. Because Santiago accounts for over 40% of the population, it has a large effect on the weighted correlation. If Santiago is removed (see figure 3), the relationship remains moderate but becomes positive ($r = 0.37$, $p = .23$, not statistically significant). This would suggest that those regions with higher inequality would also have a higher percent in poor health. While the r values indicate a moderate relationship in both cases (De Vaus 2002), including Santiago and excluding Santiago, neither relationship is statistically significant.

However, as the regional data are a result of aggregating the individual level data, relying on significance can be misleading (Reese 2004). Sterne and Davey Smith (2001) argue that while significance is important it must be interpreted in reference to the study parameters and not as an arbitrary division of significant being important versus not significant being not important. Whereas in the individual data set there are approximately 174,000 respondents, in the regional data the aggregation to regions leads to only 13 cases. Due to the large sample size of the original sample, it is likely that these findings would be reproduced were a similar analysis carried out. The lack of statistical significance

in the regional analysis is in large part because there are only 13 regions; such a small number decreases the likelihood of having a statistically significant result due to low statistical power.

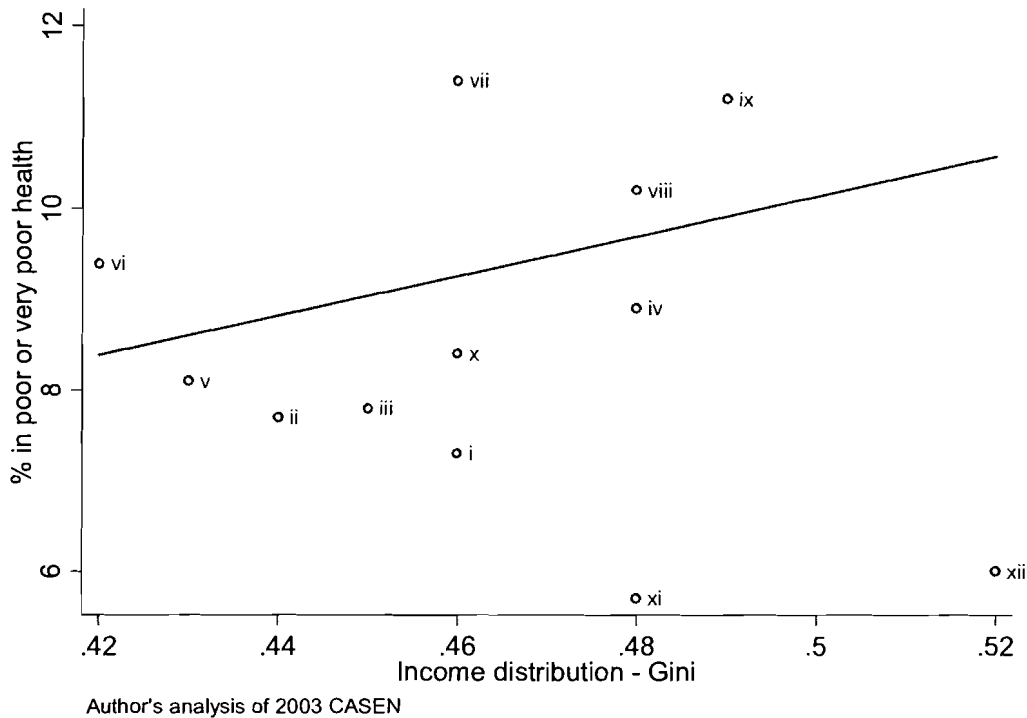
Self-assessed health is not significant though has a moderate negative relationship with the Gini coefficient when Santiago is included. This finding is opposite to that hypothesized by the Wilkinson model, with regions with lower inequality having poorer health. However, excluding Santiago indicates support for the Wilkinson model in the rest of the country. This indicates that Santiago is an outlier that has extremely high inequality but a lower percent with poor health.

Figure 2. Percent in Poor Health by Gini Coefficient



($r = -0.47$, N.S.)

Figure 3. Percent in Poor Health by Gini Coefficient – Santiago excluded



($r = 0.37$, N.S.)

Capability Analysis – Absolute Income Effect

The descriptive results for CASEN 2006 are presented below in tables 13 and 14. There were 189,758 respondents over age eighteen that took part in the survey. As would be expected, in the unweighted percentages there is a slight over-sampling of the rural respondents. Results in the demographic tables closely resemble those found in the CASEN 2003 demographic variables. One notable difference lies in the percentage of respondents below the poverty line. In the 2003 data set, approximately fifteen percent were in poverty. However, in the 2006 version that percent had declined to just over ten percent. This finding may be due in part to the redefinition of the poverty line from 43,712 pesos for urban areas and 29,473 pesos for rural in the 2003 CASEN to 47,099 pesos for urban

respondents and 31,356 pesos for rural residents in the 2006 CASEN (CASEN 2006a). On first glance, it may seem unlikely for such a large change in the poverty rate in only three years. However, Chile has had a recent history of rapid poverty reduction. From 1990 to 2003 the poverty rate fell from 33.3% to 15.2% (Damián and Boltvinik 2006). Further, a recent Economic Commission for Latin America and the Caribbean (ECLAC) (2006) report argues that from 2003-2006 Latin America overall has had its best performance on social indicators than at any time in the past 25 years. These findings make the substantial decrease in poverty between 2003 and 2006 seem plausible.

Table 13. CASEN 2006 Demographic Variables

Variable	N	Unweighted %	Weighted %
Demographic Characteristics			
Gender	189,758		
Male	92,408	48.7	47.6
Female*	97,350	51.3	52.4
Age	189,758		
18-24	30,803	16.2	17.3
25-34	34,970	18.4	19.7
35-44*	38,726	20.4	20.6
45-54	33,059	17.4	17.9
55-64	23,162	12.2	11.6
65+	29,038	15.3	13.1
Marital Status	189,693		
Married*	84,627	44.6	43.9
Cohabiting	26,727	14.1	13.6
Annulled	258	0.1	0.2
Separated	9,479	5.0	6.1
Divorced	269	0.1	0.2
Widowed	11,843	6.2	5.8
Single	56,490	29.8	30.3
Education	189,292		
None (0 years)	10,551	5.6	3.3
Primary (1-8 years)*	79,852	42.2	30.5
Secondary (9-12 years)	71,911	38.0	43.0
Tertiary (13+ years)	26,978	14.3	23.2
Urban/Rural	189,758		
Urban*	116,842	61.6	87.2
Rural	72,916	38.4	12.8
Income Quintile (National Per Capita)	189,265		
1 Lower	51,381	27.2	19.4
2 Lower-Middle*	45,318	23.9	20.8
3 Middle	38,616	20.4	20.8
4 Upper-Middle	31,718	16.8	20.5
5 Upper	22,232	11.8	18.6
Poor	189,412		
Poor	23,595	12.5	10.9
Not Poor*	165,817	87.5	89.1

* denotes weighted modal category

The proportions of the population in each health system for CASEN 2006 (table 14) also show similarities to those found in 2003. An overwhelming majority (82.2%) did receive a health consultation when they had a self-reported health problem in the last 30 days. For those that did not receive a health consultation over half (66.9%) felt that a consultation was not necessary for their health problem.

Table 14. CASEN 2006 Health Variables

Variable	N	Unweighted %	Weighted %
Health Characteristics			
System of Health Insurance	187,332		
Public System Group A*	72,038	38.5	28.0
Public System Group B	52,451	28.0	25.4
Public System Group C	19,194	10.3	12.2
Public System Group D	12,917	6.9	9.3
Public System (Doesn't know which group)	2,391	1.3	1.9
FF.AA and of Order	3,413	1.8	2.9
ISAPRE	13,449	7.2	13.7
None (individual)	10,786	5.8	6.1
Other system	693	0.4	0.5
Did you get a consultation for that health problem?	28,821		
Yes*	23,654	82.1	82.2
No	5,167	17.9	17.9
Why didn't you have a consultation?	4,795		
Not considered necessary, didn't do anything *	1,984	41.4	42.0
Not considered necessary, used home remedies	1,419	29.6	24.9
Thought about it, but did not have the money	477	10.0	13.7
Thought about it, but did not have the time	367	7.7	8.7
Thought about it, but it costs money to go to a place to get medical attention	223	4.7	2.9
Requested appointment, but was not able to obtain it	185	3.9	4.0
Obtained appointment but it still has not happened	111	2.3	2.8
Obtained appointment and did not use it	29	0.6	1.0

* denotes weighted modal category

The measures outlined in table 15 will be used to examine effects of income inequality on health functionings. Examining these outcome measures helps to provide a link to understanding the substantive health freedoms Chileans experience (Sen 1999). Nearly one-fifth (16.4%) of respondents identified having a health problem in the past thirty days. Health care utilization measured the use of health services in the past three months; nearly seventy percent had not had any type of health care consultation. Finally, 4.9% of respondents reported not receiving needed health care for their health problem or illness in the last 30 days.

Table 15. Functionings Variables

Variable	N	Unweighted %	Weighted %
Functionings Measures			
Recent health problem	189,431		
Yes	29,275	15.5	16.4
No	160,156	84.6	83.6
Health care utilization	189,758		
None	136,909	72.2	69.1
At least one consultation	52,849	27.9	30.9
Unmet needs	28,449		
Needed medical attention – didn't receive it	1,392	4.9	5.6
Received medical attention or not considered necessary	27,057	95.1	94.4

The 2006 bivariate findings utilize the three health capabilities measures as dependent variables with a variety of key factors. Women were much more likely to report a recent health problem than men were (19.6% and 12.8%,

respectively) ($\chi^2=1623.5$, $p<0.001$). Particularly interesting is that those with no insurance were the least likely to report having a health problem with 9.6% ($\chi^2=668.2$, $p<0.001$). Clear gradients in education and age were found for a recent self-reported health problem, with those with less education ($\chi^2=1698.9$, $p<0.001$) and those who were older ($\chi^2=5856.1$, $p<0.001$) being more likely to experience a health problem. Though statistically significant, the poor were not substantively¹⁴ more likely to report having had a health problem than those who were not below the poverty line (17.3 versus 16.3, respectively; $\chi^2=14.7$, $p<0.05$).

For health care utilization, the young were less likely to utilize health care ($\chi^2=5319.3$, $p<0.001$). Of those with secondary education, 72.6% did not utilize health care, the highest percent for any education level ($\chi^2=841.1$, $p<0.001$). Those respondents living in a rural area were significantly more likely to have not utilized health care than those living in an urban setting (75.5% and 68.2%, respectively; $\chi^2=524.7$, $p<0.001$). An income gradient in utilization of health care was also observed with those at the highest end being the least likely to utilize care ($\chi^2=1273.2$, $p<0.001$). It is likely that those who are wealthiest are suffering less from medical problems and so need less care.

For unmet health care needs, the bivariate findings were much less clear. While most variables were statistically significant, most fail to have substantive differences on the key independent variables presented. One key finding, which would be expected, is that those with no health insurance were much more likely

¹⁴ While a finding may be statistically significant, the difference between the groups may lack meaningfulness if it is extremely small (one percent in this case). Though the difference may be found in the actual population, the statistical significance here is more likely due to the extremely large sample size than to an important difference between the groups (De Vaus 2002; Salkind 2004).

to have needed health care but not received it than those with insurance were ($\chi^2=289.5$, $p<0.001$). A small, imperfect gradient in unmet needs by income quintile was found, those in the lower income quintiles were slightly more likely to have needed health care but not receive it ($\chi^2=68.5$, $p<0.001$).

Table 16. CASEN 2006 Functionings Measures by Select Factors

	Recent Health Problem ^a (past thirty days)			Health Care Utilization ^a (past three months)			Unmet Needs ^b		
	Yes	No	Significance	None	At least one	Significance	Needed but did not receive	Received Health Care or Not Considered Necessary	Significance
Sex			p < 0.001			p < 0.001			p < 0.01
Male	12.8	87.2		76.3	23.7		6.5	93.5	
Female	19.6	80.4		62.6	37.4		5.0	95.0	
Age			p < 0.001			p < 0.001			p < 0.001
18-24	9.5	90.5		77.1	22.9		6.1	93.9	
25-34	11.8	88.2		75.4	24.6		8.4	91.6	
35-44	13.2	86.8		72.8	27.2		6.8	93.2	
45-54	17.8	82.2		66.7	33.3		5.0	95.0	
55-64	23.1	76.9		60.7	39.3		4.9	95.1	
65+	29.5	70.5		54.2	45.9		3.7	96.3	
Education			p < 0.001			p < 0.001			N.S.
None	24.9	75.1		64.9	35.1		4.3	95.7	
Primary	20.8	79.2		66.7	33.3		5.2	94.8	
Secondary	14.1	85.9		72.6	27.4		5.9	94.2	
Tertiary	13.6	86.4		66.3	33.7		5.8	94.2	
Health System			p < 0.001			p < 0.001			p < 0.001
Public	17.5	82.5		69.0	31.0		5.6	94.4	

	Recent Health Problem ^a (past thirty days)		Health Care Utilization ^a (past three months)		Unmet Needs ^b	
Private	13.6	86.4	62.9	37.1	2.6	97.4
None	9.6	90.4	84.7	15.3	16.4	83.6
Other	18.0	82.0	61.2	38.8	3.1	96.9
Income Quintile (National Per Capita)						
1 Lowest	17.8	82.2	72.1	27.9	7.0	93.0
2	16.2	83.8	71.9	28.1	6.6	93.4
3	16.3	83.7	71.1	28.9	4.7	95.3
4	16.7	83.3	68.0	32.1	5.2	94.8
5 Highest	15.0	85.0	61.8	38.2	4.0	96.0
Urban/Rural						
Urban	16.7	83.3	68.2	31.8	5.5	94.5
Rural	14.4	85.7	75.5	24.5	5.8	94.2
Marital Status						
Married/ Cohabiting	17.1	82.9	67.8	32.2	5.4	94.7
Separated/Widowed/ Annulled	25.4	74.7	58.7	41.3	5.0	95.0
Single	11.5	88.5	75.9	24.1	6.7	93.3
Below the Poverty Line						
Poor	17.3	82.7	72.8	27.2	7.7	92.3
Not Poor	16.3	83.7	68.6	31.4	5.3	94.7

Notes: ^a N ranges from 187,053 – 189,758. ^b N ranges from 28,278 – 28,449. Statistical significance ascertained with chi-square tests.

The multivariate findings for the capability analysis utilized each of the functioning measures as the dependent variable in a logistic regression. For likelihood of having a recent health problem (table 17), some findings that were significant in the unadjusted model (model 1) became not statistically significant once the model was fully specified. Most important for this analysis is income quintile. All of the quintiles were significant in the unspecified model but some lost their significance with the addition of health insurance system in the second model. In the fully specified model, only quintiles 2 and 5 (lowest) are significant and are 1.1 and 1.2 times more likely to have experienced a health problem than those in the highest income quintile, respectively. Those with no insurance are consistently less likely than those with private insurance to have a self-reported health problem in the last 30 days, though the proportion shifts from 32% less likely in the unspecified model to 27% in the fully specified model. Respondents with public insurance also remain consistently more likely than those with private insurance to have a self-reported health problem. This relationship also becomes reduced as the model becomes specified. The addition of age, in model 4, in particular reduced the effect of insurance type. One interesting finding is the strong effect of those with only primary or no education in the unspecified model that becomes insignificant in the later models. A clear age gradient was also found to remain significant, with those who are 65 and older being three times as likely to report a recent health problem.

For the second functionings measure, likelihood of having utilized health care (table 18), a clear income gradient is present in the unspecified model. Those in the lowest income quintile are 1.6 times more likely to have not utilized health care than those in the highest quintile. This relationship becomes less striking through the different models but consistently remains significant. In the fully adjusted model, a less striking gradient is present, with those in the lower three income quintiles being roughly 1.4 times as likely to have not utilized health care. Also interesting is the role played by insurance type. Those with no insurance, as would be expected, are 3.26 times more likely to have not utilized health care in the past three months than those with private insurance. This relationship remains significant but becomes reduced to 2.53 times in the final model. Those with public insurance were also less likely than those with private insurance to have utilized health care in the past 3 months. The relationship remains significant throughout but its effect is reduced from 1.31 times in model 1 to 1.17 times in the fully adjusted models. The addition of income quintile had the largest effect on reducing the role of insurance type. For those respondents aged thirty-five or older a clear gradient in health care utilization was found. One interesting result was the role of education on health care utilization. Those with less education were less likely to have utilized health care in the fully specified model. This was in contrast to the unspecified model where those with less education than secondary were *more* likely to have utilized health care than those respondents who had secondary education. Also interesting, though not

surprising, is that those in rural areas were more likely to have not utilized health care.

The final functioning measure, unmet needs (table 19), had a much smaller sample size, which may have played a role in the lack of significance for some of the findings. Of particular interest is that the top three income quintiles had approximately equal likelihood of having needed health care but not received it. The lowest two (4 and 5) had significantly higher likelihood of not receiving needed care (1.68 and 1.79 times, respectively). These odds ratios remained consistent throughout the models. Also interesting was the role of insurance type on unmet needs. Those with no insurance were 6.97 times more likely to have needed health care and not received it than those with private insurance. While this finding may be expected, a significant effect was also found for those with public insurance. Respondents enrolled in public insurance were 2.36 more likely than those with private insurance to have had unmet health care needs. Age and education were not significant factors for unmet needs with only respondents aged 25-34 being 1.57 times more likely than respondents aged 18-24 to have needed care but not receiving it. Similarly, marital status and urban/rural residence were not significant predictors in the fully specified model. Marital status, however was significant in model 1 with those who are married/cohabitating and those that are separated/widowed/divorced being less likely (21% and 26%, respectively) than those who are single to have unmet care needs.

Table 17. Likelihood of having had a Health Problem by Key Factors (Odds Ratios and 95% Confidence Intervals)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Income Quintile							
Highest	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.13 (1.05-1.22)	1.05 (0.96-1.13)	1.05 (0.97-1.14)	1.10 (1.01-1.20)	1.12 (1.03-1.21)	1.12 (1.03-1.22)	1.11 (1.02-1.21)
3	1.10 (1.02-1.19)	0.99 (0.92-1.07)	1.00 (0.92-1.08)	1.05 (0.96-1.13)	1.06 (0.97-1.15)	1.06 (0.97-1.15)	1.06 (0.98-1.15)
4	1.09 (1.01-1.17)	0.96 (0.89-1.04)	0.96 (0.89-1.04)	1.04 (0.96-1.13)	1.06 (0.97-1.15)	1.06 (0.97-1.15)	1.07 (0.98-1.16)
Lowest	1.22 (1.14-1.31)	1.07 (0.99-1.16)	1.06 (0.98-1.15)	1.15 (1.01-1.25)	1.17 (1.07-1.27)	1.17 (1.07-1.27)	1.20 (1.10-1.31)
Health Insurance							
Private	1.00	1.00	1.00	1.00	1.00	1.00	1.00
None	0.68 (0.59-0.77)	0.67 (0.59-0.77)	0.71 (0.62-0.82)	0.71 (0.61-0.81)	0.72 (0.63-0.83)	0.72 (0.63-0.84)	0.73 (0.63-0.84)
Public	1.35 (1.25-1.46)	1.35 (1.24-1.47)	1.31 (1.21-1.43)	1.09 (1.00-1.19)	1.11 (1.01-1.22)	1.11 (1.01-1.22)	1.12 (1.02-1.23)
Other	1.39 (1.20-1.61)	1.39 (1.20-1.61)	1.39 (1.19-1.61)	1.09 (0.94-1.28)	1.12 (0.96-1.31)	1.12 (0.95-1.31)	1.11 (0.95-1.30)
Gender							
Male	1.00		1.00	1.00	1.00	1.00	1.00
Female	1.67 (1.60-1.74)		1.63 (1.56-1.70)	1.62 (1.54-1.69)	1.61 (1.54-1.69)	1.60 (1.52-1.66)	1.58 (1.51-1.65)
Age							
18-24	1.00			1.00	1.00	1.00	1.00
25-34	1.28 (1.17-1.40)			1.27 (1.16-1.40)	1.27 (1.16-1.39)	1.20 (1.10-1.32)	1.20 (1.10-1.32)
35-44	1.46 (1.34-1.59)			1.42 (1.31-1.55)	1.42 (1.30-1.55)	1.31 (1.19-1.44)	1.31 (1.19-1.44)
45-54	2.01 (1.90-2.24)			2.03 (1.87-2.21)	2.02 (1.85-2.21)	1.85 (1.68-2.04)	1.84 (1.67-2.03)
55-64	2.86 (2.63- 3.12)			2.79 (2.56- 3.05)	2.76 (2.52-3.03)	2.50 (2.26-2.77)	2.45 (2.24-2.75)
65+	3.99 (3.69- 4.33)			3.75 (3.45- 4.07)	3.68 (3.36-4.03)	3.24 (2.93-3.59)	3.21 (2.90-3.56)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Education							
Tertiary	1.00				1.00	1.00	1.00
Secondary	1.04 (0.97-1.10)				0.90 (0.84-0.97)	0.89 (0.83-0.96)	0.90 (0.84-0.96)
Primary	1.66 (1.56-1.77)				0.96 (0.89-1.04)	0.95 (0.88-1.03)	1.00 (0.92-1.08)
None	2.10 (1.91- 2.31)				1.00 (0.89-1.12)	0.99 (0.89-1.11)	1.07 (0.95-1.20)
Marital Status							
Single	1.00					1.00	1.00
Married /Cohabiting	1.59 (1.51-1.68)					1.11 (1.05-1.18)	1.11 (1.04-1.18)
Separated /Widowed /Divorced	2.62 (2.45-2.81)					1.27 (1.17-1.37)	1.25 (1.15-1.35)
Urban/Rural							
Urban	1.00						1.00
Rural	0.84 (0.81-0.87)						0.75 (0.72-0.78)
N	N/A	186,582	186,582	186,582	186,141	186,082	186,082
Sig	N/A	.001	.001	.001	.001	.001	.001

Table 18. Likelihood of having Not Utilized Health Care by Key Factors (Odds Ratios and 95% Confidence Intervals)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Income Quintile							
Highest	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.31 (1.23-1.39)	1.30 (1.41-1.59)	1.30 (1.22-1.38)	1.26 (1.19-1.35)	1.20 (1.13-1.29)	1.20 (1.13-1.28)	1.21 (1.13-1.29)
3	1.52 (1.43-1.61)	1.50 (1.49-1.68)	1.51 (1.42-1.61)	1.48 (1.38-1.57)	1.38 (1.29-1.47)	1.38 (1.29-1.47)	1.38 (1.29-1.47)
4	1.58 (1.50-1.68)	1.58 (1.50-1.70)	1.60 (1.50-1.70)	1.52 (1.43-1.62)	1.41 (1.31-1.50)	1.41 (1.31-1.50)	1.39 (1.30-1.49)
Lowest	1.60 (1.51-1.69)	1.60 (2.54-3.20)	1.64 (1.54-1.74)	1.56 (1.47-1.66)	1.42 (1.33-1.52)	1.42 (1.33-1.52)	1.39 (1.29-1.48)
Health Insurance							
Private	1.00	1.00	1.00	1.00	1.00	1.00	1.00
None	3.26 (2.91-3.66)	2.85 (2.54-3.20)	2.70 (2.40-3.04)	2.75 (2.44-3.09)	2.59 (2.29-2.92)	2.55 (2.26-2.87)	2.53 (2.24-2.85)
Public	1.31 (1.24-1.39)	1.06 (1.00-1.13)	1.10 (1.03-1.17)	1.27 (1.19-1.36)	1.19 (1.11-1.27)	1.18 (1.10-1.26)	1.17 (1.09-1.25)
Other	0.93 (0.83-1.04)	0.84 (0.75-0.94)	0.84 (0.75-0.94)	1.01 (0.89-1.13)	0.96 (0.85-1.09)	0.97 (0.86-1.09)	0.98 (0.86-1.10)
Gender							
Male	1.00		1.00	1.00	1.00	1.00	1.00
Female	0.52 (0.50-0.54)		0.52 (0.50-0.54)	0.52 (0.50-0.54)	0.52 (0.50-0.54)	0.53 (0.51-0.55)	0.53 (0.51-0.55)
Age							
18-24	1.00		1.00	1.00	1.00	1.00	1.00
25-34	0.91 (0.85-0.97)		0.94 (0.88-1.00)	0.94 (0.88-1.00)	0.93 (0.87-1.00)	1.01 (0.94-1.08)	1.01 (0.94-1.08)
35-44	0.80 (0.75-0.85)		0.82 (0.77-0.87)	0.82 (0.77-0.87)	0.79 (0.74-0.85)	0.89 (0.83-0.96)	0.90 (0.83-0.96)
45-54	0.60 (0.56-0.64)		0.62 (0.58-0.66)	0.62 (0.58-0.66)	0.59 (0.55-0.63)	0.67 (0.63-0.72)	0.68 (0.63-0.73)
55-64	0.46 (0.43-0.49)		0.48 (0.45-0.51)	0.48 (0.45-0.51)	0.45 (0.42-0.48)	0.51 (0.47-0.55)	0.52 (0.48-0.56)
65+	0.35 (0.33-0.37)		0.36 (0.34-0.39)	0.36 (0.34-0.39)	0.33 (0.31-0.36)	0.39 (0.36-0.42)	0.39 (0.36-0.42)
Education							
Tertiary	1.00		1.00	1.00	1.00	1.00	1.00
Secondary	1.35 (1.29-1.42)		1.26 (1.19-1.33)	1.28 (1.21-1.35)	1.26 (1.19-1.33)	1.28 (1.21-1.35)	1.27 (1.20-1.34)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Primary	1.02 (0.97-1.07)				1.28 (1.20-1.36)	1.30 (1.22-1.38)	1.24 (1.16-1.32)
None	0.94 (0.86-1.02)				1.41 (1.28-1.56)	1.41 (1.27-1.56)	1.31 (1.18-1.45)
Marital Status							
Single	1.00					1.00	1.00
Married /Cohabiting	0.67 (0.64-0.70)					0.84 (0.80-0.89)	0.84 (0.80-0.89)
Separated /Widowed /Divorced	0.45 (0.43-0.48)					0.79 (0.74-0.85)	0.81 (0.75-0.86)
Urban/Rural							
Urban	1.00						1.00
Rural	1.43 (1.39-1.48)						1.35 (1.30-1.40)
N	N/A	186,859	186,859	186,859	186,416	186,356	186,356
Sig	N/A	.001	.001	.001	.001	.001	.001

Table 19. Likelihood of having Needed Health Care but Not Received it by Select Factors (Odds Ratios and 95% Confidence Intervals)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Income Quintile							
Highest	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.32 (0.91-1.91)	1.26 (0.85-1.85)	1.26 (0.85-1.86)	1.28 (0.87-1.88)	1.35 (0.91-2.01)	1.36 (0.92-2.02)	1.36 (0.92-2.02)
3	1.17 (0.83-1.67)	1.07 (0.73-1.57)	1.07 (0.73-1.57)	1.12 (0.77-1.63)	1.20 (0.81-1.79)	1.21 (0.81-1.79)	1.21 (0.81-1.79)
4	1.70 (1.20-2.40)	1.54 (1.05-2.25)	1.54 (1.05-2.25)	1.57 (1.08-2.29)	1.67 (1.12-2.50)	1.68 (1.12-2.52)	1.68 (1.12-2.52)
Lowest	1.80 (1.29-2.52)	1.61 (1.11-2.35)	1.62 (1.12-2.36)	1.64 (1.13-2.38)	1.78 (1.18-2.69)	1.79 (1.19-2.70)	1.79 (1.19-2.70)
Health Insurance							
Private	1.00	1.00	1.00	1.00	1.00	1.00	1.00
None	7.34 (4.55-11.82)	6.63 (4.10-10.71)	6.54 (4.04-10.58)	6.60 (4.07-10.69)	7.20 (4.37-11.75)	6.97 (4.24-11.46)	6.97 (4.24-11.46)
Public	2.21 (1.50-3.26)	1.86 (1.22-2.83)	1.90 (1.25-2.89)	2.17 (1.42-3.32)	2.38 (1.53-3.72)	2.36 (1.51-3.67)	2.36 (1.51-3.67)
Other	1.18 (0.59-2.38)	1.10 (0.55-2.21)	1.12 (0.56-2.24)	1.34 (0.67-2.70)	1.44 (0.71-2.94)	1.43 (0.71-2.91)	1.43 (0.71-2.91)
Gender							
Male	1.00		1.00	1.00	1.00	1.00	1.00
Female	0.75 (0.63-0.90)		0.77 (0.64-0.93)	0.77 (0.64-0.93)	0.76 (0.63-0.92)	0.74 (0.62-0.90)	0.74 (0.62-0.90)
Age							
18-24	1.00			1.00	1.00	1.00	1.00
25-34	1.42 (0.98-2.06)			1.50 (1.02-2.19)	1.51 (1.03-2.21)	1.57 (1.05-2.34)	1.57 (1.05-2.34)
35-44	1.14 (0.80-1.61)			1.23 (0.86-1.76)	1.21 (0.84-1.75)	1.28 (0.85-1.94)	1.28 (0.85-1.94)
45-54	0.82 (0.57-1.17)			0.88 (0.61-1.26)	0.90 (0.61-1.33)	0.94 (0.61-1.45)	0.94 (0.61-1.45)
55-64	0.80 (0.56-1.16)			0.87 (0.59-1.27)	0.91 (0.60-1.40)	0.95 (0.59-1.51)	0.95 (0.59-1.51)
65+	0.59 (0.42-0.83)			0.62 (0.43-0.89)	0.66 (0.44-1.00)	0.67 (0.42-1.06)	0.67 (0.42-1.06)
Education							
Tertiary	1.00				1.00	1.00	1.00
Secondary	1.00 (0.76-1.32)				0.83 (0.61-1.13)	0.84 (0.61-1.14)	0.84 (0.61-1.14)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Primary	0.89 (0.68-1.16)				0.83 (0.58-1.21)	0.84 (0.58-1.22)	0.84 (0.58-1.22)
None	0.73 (0.48-1.10)				0.71 (0.42-1.19)	0.70 (0.42-1.18)	0.70 (0.42-1.18)
Marital Status							
Single	1.00					1.00	1.00
Married /Cohabiting	0.79 (0.64-0.98)					0.89 (0.69-1.16)	0.89 (0.69-1.16)
Separated /Widowed /Divorced	0.74 (0.57-0.97)					1.08 (0.79-1.48)	1.08 (0.79-1.48)
Urban/Rural							
Urban	1.00						1.00
Rural	1.05 (0.89-1.24)						1.00 (0.84-1.20)
N	N/A	28,246	28,246	28,246	28,194	28,184	28,184
Sig	N/A	.001	.001	.001	.001	.001	.001

Capability Analysis – Income Inequality Effect

The 2006 descriptive region findings are presented in tables 20 and 21. Similar to 2003 regional findings, the Santiago metropolitan region is largest with 40.7% of the population. The smallest region is Aisén with about 0.5% of the population or around 61,729 residents aged 18 and older. The mean education levels of the different regions range widely from a high of 10.3 years in Santiago to 7.9 years in both Maule and Araucanía. As for the percentage with no formal education, the Magallanes and Chilean Antarctic region is the lowest with 1.8% and Tarapacá, at 8.0%, is the highest. Mean age is one of the variables with the smallest range with an average of 43.9 years. The region with the highest mean age is Los Lagos at 44.7 years and the low is Antofagasta at 41.6 years. Antofagasta is also the region with the lowest percentage of elderly residents (those aged 65 and older) with 11.4%. The region with the highest percent of residents aged 65+ is Araucanía at 16.8%.

There were interesting regional differences for the functionings measures as well. The percentage of respondents with a recent health problem ranged from a low of 10.0% in Aisén to a high of 20.4% in Araucanía, with an average of 15.5%. For the percent that did not utilize health care in the past three months the average was 72.2%. Aisén had the highest percentage of individuals that did not utilize health care with 81.5% while Santiago was the lowest at 69.2%. Finally, the percentage that needed care but did not receive it was highest in Tarapacá with 6.7% and lowest in Aisén with 3.1%, the overall average was 4.9%.

As to percentage of respondents living in an urban setting, Santiago was highest with 87.3%, much higher than the average of 61.6%. The region with the lowest level of urbanization was Los Lagos with 43.6%. The percentage of respondents living below the poverty line varied widely from a high of 20.3% in Araucanía to a low of 4.0% in Magallanes and the Chilean Antarctic, with the country average at 12.5%. The rate of respondents with public health insurance was on average 84.9% with a high of 91.1% in both Bio-Bío and Araucanía. Magallanes and Chilean Antarctic had the lowest percentage of respondents with public insurance with 69.4%. Finally, while lower than in 2003, the Gini coefficients were still among the highest in Latin America and the world. The country Gini was .49 with the highest income inequality experienced by Santiago at .51 and the lowest in Aisén, O'Higgins, and Atacama with .43.

Table 20. CASEN 2006 Regional Descriptive Variables

Region	N, un-weighted (%)	% Weighted	Population 2006 CASEN estimate	% with Recent Health Problem	Gini Coefficient	% with Public Health Insurance	Mean Education (in years)	% with no Education	Mean Age (in years)	% Age 65+
I Tarapacá	5,109 (2.7)	2.7	313,171	15.9	.44	80.7	8.6	8.0	44.5	16.3
II Antofagasta	4,874 (2.6)	3.2	363,314	13.7	.50	74.1	10.0	3.8	41.6	11.4
III Atacama	4,611 (2.4)	1.5	174,707	14.4	.43	85.0	9.3	5.0	42.7	12.9
IV Coquimbo	8,430 (4.4)	4.1	472,871	13.7	.45	90.4	8.4	7.1	44.4	16.7
V Valparaíso	19,949 (10.5)	10.2	1,168,931	15.0	.44	85.1	9.5	3.7	44.0	15.6
VI O'Higgins	18,530 (9.8)	5.3	606,117	14.9	.43	86.2	8.2	6.9	44.2	15.5
VII Maule	16,890 (8.9)	6.00	683,158	14.2	.46	90.8	7.8	7.9	44.4	16.0
VIII Bio-Bio	30,078 (15.9)	12.2	1,393,641	16.1	.47	91.1	8.4	6.5	44.3	15.9
IX Araucanía	17,469 (9.2)	5.56	635,496	20.4	.48	91.1	7.8	7.9	44.6	16.8
X Los Lagos	21,602 (11.4)	7.0	795,573	16.0	.46	87.0	7.9	5.5	44.7	16.3
XI Aisén	2,693 (1.4)	0.5	61,729	10.0	.43	77.5	8.7	5.5	43.7	13.9
XII Magallanes and Chilean Antarctic	2,483 (1.3)	0.9	106,748	11.9	.45	69.4	9.7	1.8	44.2	13.7
R.M. Santiago Metropolitan Region	37,040 (19.5)	40.7	4,656,280	14.7	.51	74.4	10.3	2.9	43.0	13.5
Total	189,758 (100.0)	100.0	11,431,736	15.5	.49	84.9	8.8	5.6	43.9	15.3

Table 21. CASEN 2006 Regional Descriptive Variables (continued)

Region	% that did not get a consultation for their Health Problem	%that needed Health Care but did not Receive it	% that did not Utilize Health Care	Median Income (2003 Chilean Peso)	Percent Urban	Percent Below the Poverty Line
I Tarapacá	24.8	6.7	77.3	370,280	51.8	11.0
II Antofagasta	21.1	5.2	73.6	579,731.5	71.5	5.0
III Atacama	20.4	5.7	72.8	488,852	69.4	6.0
IV Coquimbo	17.7	3.8	73.9	317,596	49.7	13.6
V Valparaiso	14.8	4.0	70.1	389,853	79.1	11.3
VI O'Higgins	17.7	4.2	75.2	337,496.5	50.7	10.0
VII Maule	13.7	4.5	75.9	294,472	41.8	14.8
VIII Bio-Bio	17.2	4.7	70.9	282,840.5	59.7	19.4
IX Araucanía	23.5	5.0	71.3	261,138	47.9	20.3
X Los Lagos	21.4	6.2	72.5	349,286	43.6	9.7
XI Aisén	15.5	3.1	81.5	486,947	59.1	5.6
XII Magallanes and Chilean Antarctic	15.7	5.5	70.5	534,624	58.8	4.0
R.M. Santiago Metropolitan Region	15.0	5.1	69.2	498,800	87.3	8.3
Total	17.9	4.9	72.2	453,720	61.6	12.5

The regional bivariate table (table 22) provides a correlation matrix of the different bivariate relationships of the key factors. Of the inequality measures, only the Gini coefficient was statistically significant for the percentage of respondents that had a health problem, a moderate negative correlation of -0.57. This indicates that those regions with higher inequality actually had a *lower* percentage of respondents that reported having a problem in the past thirty days. This is counter to what was hypothesized. While not statistically significant, though close, one interesting relationship was between GE (-1), the general entropy index that measures inequality at the lowest levels of income, and percentage of respondents who had a recent health problem. There was a positive moderate relationship of 0.52. For the poor there appears to be a connection between income inequality and health, in the direction that would be predicted by the literature (Subramanian et al. 2003) and was hypothesized. The apparently contradictory findings are likely due to the level of income inequality to which they are sensitive. Among the poor, it appears that regions with higher inequality also have a higher percentage reporting a recent health problem. This finding is the opposite for the Gini coefficient, which is sensitive to inequality in the middle income range.

The second functionings measure, percentage that did not utilize health care, also had a negative relationship with the Gini coefficient, though this time moderately strong at $r = -0.68$ ($p < 0.05$). This indicates that in regions of lower inequality respondents were more likely to report not having utilized health care. This negative relationship is also repeated for the general entropy indexes with

GE (0) and GE (1), the two indexes that measure the middle of the income spectrum, having coefficients of -0.72 ($p < 0.01$) and -0.75 ($p < 0.01$), respectively.

For those that needed care but did not receive it, none of the inequality measures were statistically significant at the regional level. Despite this finding, each of the inequality measures had a moderate weak positive relationship with percentage of respondents with unmet needs. This indicates that in regions with higher inequality there was an increased percentage of respondents with unmet care needs. The lowest coefficient is for GE (2) ($r = 0.25$), the measure that examines inequality among the wealthiest. The highest coefficient is for GE (0), which is sensitive to inequality in the lower middle of the income spectrum, at 0.34. While not significant at the regional level, they still indicate a relationship because, as discussed previously, the data was aggregated from 180,000 cases. Similar relationships would likely be repeated with another such large sample.

Another interesting finding was the relationship between urbanization and the functionings measures. The percentage that had a health problem has a moderate negative correlation with the percentage urbanization of -0.61, indicating that more urbanized regions had a lower percent of people reporting a health problem in the last 30 days. For not utilizing health care and urbanization rate the correlation was -0.79. Less urbanized regions had a higher percentage of respondents reporting no health-care utilization.

When Santiago was excluded from the 2006 bivariate regional analysis, the findings remain generally consistent but weaker, likely due to the reduced number of cases. One interesting finding was that for GE (-1), the GE measure

sensitive to inequality amongst the poor, and utilization of health care; the relationship remained about the same strength but changed direction, from -0.36 ($p = 0.22$, not statistically significant) to 0.29 ($p = 0.35$, not statistically significant). This indicates that for the poor, when Santiago is excluded, regions with higher inequality have a higher percentage of participants reporting not utilizing care. This may indicate that barriers to care for the poor are greater outside Santiago.

Table 22. CASEN 2006 Regional Correlation Matrix

	Public insurance	Regional Gini	Health problem	Needed care	Non-utilization	Mean age	Age 65+	Mean education	No Education	Median income	Urban	Poverty Line	GE (-1)	GE (0)	GE (1)	GE (2)
Public insurance	1.00															
Regional Gini	-0.72†	1.00														
Health problem	0.54	-0.57*	1.00													
Needed care	-0.31	0.30	0.28	1.00												
Non-utilization	0.51	-0.68*	0.35	-0.02	1.00											
Mean age	0.86†	-0.72†	0.60*	-0.12	0.48	1.00										
Age 65+	0.89†	-0.71†	0.61*	-0.18	0.48	0.98†	1.00									
Mean education	-0.91†	0.70†	-0.63*	0.06	-0.71†	-0.88†	-0.88†	1.00								
No education	0.86†	-0.64*	0.45	-0.09	0.77†	0.78†	0.81†	-0.94†	1.00							
Median income	-0.97†	-0.64*	-0.51	0.25	-0.49	-0.92†	-0.94†	0.92†	-0.89†	1.00						
Urban	-0.82†	0.69†	-0.61*	-0.03	-0.79†	-0.81†	-0.79†	0.97†	-0.92†	0.83†	1.00					
Poverty Line	0.83†	-0.33	0.25	-0.27	0.19	0.71†	0.76†	-0.70†	0.74†	-0.88†	-0.57*	1.00				
GE (-1)	-0.57*	0.87†	0.52	0.31	-0.36	-0.52	-0.54	0.47	-0.36	0.45	0.45	-0.16	1.00			
GE (0)	-0.73†	0.99†	-0.54	0.34	-0.62*	-0.72†	-0.71†	0.68*	-0.60*	0.66*	0.65*	-0.34	0.89†	1.00		
GE (1)	-0.65*	0.86†	-0.37	0.30	-0.48	-0.75†	-0.70†	0.59*	-0.52	0.64*	0.53	-0.36	0.68†	0.89†	1.00	
GE (2)	-0.23	0.37	0.04	0.25	-0.01	-0.44	-0.36	0.12	-0.07	0.28	0.04	-0.13	0.25	0.44	0.78†	1.00

* .05 † .01 ‡ .001

CHAPTER 6: DISCUSSION

The relationship between income inequality and health has been the central focus of this project. The analysis has explored this relationship empirically for the case of Chile. With regard to the first hypothesis, a clear social gradient in self-reported health at the individual level was found for CASEN 2003. Those at the lower end of the income spectrum were significantly more likely to report being in poor health. This supports the findings of Subramanian et al (2003), who also found a health gradient across income quintiles in their study of CASEN 2000. As noted in their study, this finding indicates support for an absolute income effect on health. Also similar to previous findings is that the gradient was not linear (Subramanian et al. 2003). Those in the lowest income quintile were 2.40 times as likely to be in poor health as those in the highest income quintile, whereas those individuals one quintile higher were only 1.76 times as likely to be in poor health (see table 9, model 7).

The 2006 functionings results bring to light very interesting findings that must be connected to issues of capabilities. Individuals who had a recent health problem, did not utilize care, and had unmet care needs may face the likelihood of reduced health status and even reduced life expectancy. Making connections from the empirical findings to possible capabilities that are being impinged by inequality is key in the capability approach literature (Sen 1999). As has been

noted previously, the implicit role of capabilities can be inferred through findings on functionings (Moghadam and Senftova 2005).

For the likelihood of having a health problem, no clear gradient was found when the other key factors were controlled for. While the findings for each quintile were significant initially, the addition of other factors reduced their significance. Only the second highest and the lowest income quintiles had significant findings in the final model (see table 17, models 1 - 7), 1.11 and 1.20 times more likely to have had a health problem, respectively. This finding could indicate a couple possibilities. The first is that contrary to most findings (Marmot and Wilkinson 2006), the poor in Chile are not much more likely to experience a recent health problem than wealthier people. However, this possibility would contradict the findings in my analysis of the 2003 CASEN. Another possibility is that individuals come to adapt their preferences to their social setting (Sen 1999). This would mean that the poor in Chile may be underreporting health problems, either because they perceive them as “normal” or because they know that worrying about them will not bring treatment. De Maio (2007a) found that when comparing “objective” measures with self-reported measures of health in Argentina that, despite living in areas of high morbidity and low life-expectancy, many individual respondents still reported better than poor health. He notes that this is likely because residents in these marginalized areas make comparisons with those around them and may rate themselves as being in better health due to the overall poor health they see in their community. If adaptive preference is playing a role in people identifying health problems, it makes self-reported

measures less valid, particularly at lower levels of income. Conducting a similar analysis with other measures, possibly diagnosis rates, mortality rates, or morbidity rates, could produce a different result. Such an analysis could also help identify the external validity of self-reported measures in the CASEN. However, because the CASEN only contains self-reported health measures it would have to be supplemented by other data.

For health care utilization, a small gradient was found with those in the second highest income category being 1.21 times more likely than those in the highest category to have not utilized health care. The lowest three income quintiles were all extremely close with the third being 1.38 times and the bottom two quintiles being 1.39 times more likely to not have utilized care. These findings are particularly interesting as it is the poor who are typically the most likely to experience poor health (Raphael 2004). However, the finding that the poor were only slightly more likely to report having a recent health problem in the 2006 analysis while the poor were much more likely to report being in poor health in the 2003 analysis highlights the importance of the measures used. The fact that in Chile it is the wealthy that are the most likely to utilize care indicates the inequitable two-tier system of health care that has been noted by others (Barrientos 2000; Kubal 2006). The wealthy are more likely to use health care due to better access. The poor, who likely need the care more, are less likely to use it, probably due to a lack of access. This finding would seem to indicate that, for many in Chile, the government does not ensure adequate health capabilities.

Related to overall utilization of health care is the issue of unmet needs. In the final logistic regression model the highest three income quintiles are all approximately equally likely to have had needed care but not received it. The second to lowest and lowest income quintiles are significantly more likely to have needed care but not received it, 1.68 times and 1.79 times, respectively. These unmet needs were found despite the fact that the poor are supposed to receive adequate care under the public health system (Borzutzky 2006). This finding further indicates the unequal treatment received by the poor under Chile's health care system.

The second hypothesis for this study was that those with private insurance would be less likely to suffer self-perceived poor health or poor functionings status. For the CASEN 2003 results, those with public insurance were 1.74 times more likely to have poor self-reported health in the final model. Particularly interesting is that this was specified from 4.19 times more likely when no other factors were controlled for. Also interesting is that those individuals with no insurance and those with other types of insurance (e.g. military) were no more likely than those with private insurance to have poor self-assessed health.

For the functioning measure of having had a health problem, those with no insurance were the least likely to report having had a health problem in the past 30 days (0.73 times as likely as those with private insurance). Respondents with public insurance were 1.12 times more likely to have had a health problem than those with private insurance. This indicates that factors other than type of insurance are playing a larger role in determining the likelihood of an individual

experiencing a health problem. One possibility for the individuals with no health insurance could be that due to their lack of insurance, they may assess a health problem as less severe. Also, some of the respondents with no insurance may also be wealthy and not think that health insurance is a necessity for them.

As would be expected, those individuals without any health insurance are the most likely to have not utilized health care at 2.53 times as likely as those with private insurance. Those with public insurance were 1.17 times more likely to have not utilized health care than those with private insurance. This indicates that those with private insurance have the best access to care. This is particularly worrisome in light of the fact that those with public insurance are also more likely have experienced a recent health problem. Also, in Chile those aged 65 and older are usually covered by the public health system and are among the most likely to experience a health problem (Borzutzky 2006). However, the logistic regression indicates that the elderly are much more likely to utilize care, so unmet needs for the elderly, in general, may not be a significant problem.

Particularly damning for the Chilean health care system is the issue of unmet health care needs. Individuals with public health insurance were over twice as likely (O.R. = 2.36, C.I. = 1.51-3.67) as those with private insurance to have needed health care but not received it in the past 30 days. This finding calls into question the legitimacy of a two-tier system that has such clear inequities in service provided. This is particularly compounded by the fact that it is also those who are in the bottom income quintiles who are also more likely to have unmet health care needs. Not as surprising, but still important, is that those with no

insurance were 6.97 times as likely to have had a health problem but not received care. This finding indicates a significantly underserved portion of the population. Comparing this finding to likelihood of having a health problem could mean a couple of things. While those with no insurance were less likely to report having a health problem, those that did report a health problem may have been reporting a serious injury or illness that would require care. These individuals clearly had a difficult time receiving any care under these circumstances. Those respondents with no insurance face important barriers to utilizing health care. Though less extreme, respondents with public insurance also lack the substantive freedom of access to necessary care.

The hypothesis that rural respondents would report being in poor health is not supported by the findings. While in the unadjusted model rural respondents were 1.35 times more likely to report poor self-assessed health, in the fully adjusted model rural residents were less likely to be in poor health (0.83 times) (see table 9). This indicates that other, unexamined factors are playing a larger role in affecting the likelihood of being in poor health for rural residents. Rural residents, despite less access to care, may in fact be in better health than those living in urban areas. This could be due to increased stress experienced by urban residents as well as by increased exposure to pollution (Cakmak et al. 2007).

Similar results were found for the variables “recent health problem” and “unmet needs”. For recent health problems, those who lived in a rural area were 0.75 times as likely as urban respondents to have experienced a health problem. Rural respondents were also no more likely than urban respondents to have

unmet care needs. This was particularly surprising as other authors have noted a disparity between urban and rural health care (Borzutzky 2006; Kubal 2006).

Only for likelihood of not utilizing health care were the findings supportive of the rural hypothesis. Those respondents living in a rural area were 1.35 times more likely to have not utilized health care than those who lived in an urban setting. This supports the notions put forth by some that many rural areas do not have adequate health care services (Barrientos 2000; Borzutzky 2006).

Homedes and Ugalde (2005) argue that this is in part due to the disproportionate political power of urban residents on health issues. Urban residents in Latin America are more likely to put pressure on office holders and thus receive more health expenditures in their areas.

At the regional level, the results were also complex. With the exception of GE(-1), none of the inequality measures correlated significantly with self-reported poor health. Further, the direction of the relationships are counter to what would be expected from the literature (Subramanian et al. 2003). Regions with higher inequality had a lower percentage reporting poor health status. This counter-intuitive finding may be due to the small number of regions and heterogeneity within those regions. Possibly breaking down the population into smaller units may allow for a clearer examination of particular differences. However, it is important to keep in mind the size of the area being examined. Wilkinson and Pickett (2006) found that studies examining areas larger than municipalities were much more likely to find support for the hypothesis. Another possibility is that the health measures used, all different aspects of self-reporting, may be problematic

for the Chilean population. As discussed previously, though self-reported health is widely used in the Wilkinson literature, some argue that it is problematic (Crossley and Kennedy 2002; Sen 2002). De Maio (2008) found a stronger relationship between “objective” measures of health, life expectancy in this case, and inequality in Argentina than for self-reported morbidity. Were a similar pattern for a disjuncture between health measures present in Chile, this study, by only using self-reported measures, may be underestimating the relationship between inequality and health in Chile.

One key finding that requires discussion is that when Santiago is excluded the relationship between the Gini coefficient and the percentage reporting poor health becomes positive instead of negative. Santiago had amongst the highest Gini coefficient but one of the lowest percentages of respondents reporting poor health. Because of the large effect of Santiago in the weighted correlation, as Santiago contains approximately forty percent of the population, the relationship becomes negative. This interesting finding indicates that with the exception of Santiago the relationship between income inequality and self-reported poor health for regions in Chile is supportive of the Wilkinson model. Possible explanations for this could be that Santiago, as the capital and area of the highest population, may provide better access to care, even for those with lower income. However, due to the ecological fallacy, it must be acknowledged that

alternate explanations are possible (Diez-Roux 2001; Pearce 2000; Robinson 1950)¹⁵.

For the regional functionings analysis, the regional Gini coefficient was statistically significant with the percentage of people that had a health problem and the percent that did not utilize health care in the past three months. However, the relationship was moderate and negative in both cases (-0.57 and -0.68, respectively), indicating that regions with higher inequality actually had a lower percentage of people reporting a recent health problem and a lower percentage of respondents having not utilized health care. This is also counter-intuitive and requires further analysis to identify why this may be the case. For non-utilization of care, only GE (0), the measure of inequality at the lower-middle income spectrum, was statistically significant. Similar to the Gini coefficient, it was moderate and negative. While none of the GE measures were statistically significant for percentage that had a health problem, GE (-1), the measure of inequality among the poorest, had a moderate positive relationship. This indicates that for the poor in Chile living in a region of higher inequality is correlated with having a higher likelihood of having a health problem. That the type of inequality measure used could lead to slightly different results suggests that researchers must be careful when deciding what measures are used for measuring inequality.

¹⁵ Concern must be taken when making statements about the individual level from the regional level due to the ecological fallacy. The ecological fallacy identifies that higher levels of analysis, the regional level in this case, do not allow for statements of cause at the individual level (Robinson 1950; Pearce 2000; Diez-Roux 2002). However, due to the findings at the individual level and the findings from previous literature, my interpretation of the results does not seem unfounded.

A statistically significant relationship was not found between the percentage of people in a region with unmet health care needs and income inequality in that region. More specifically, all of the correlations between the income inequality measures and unmet needs were weak yet positive. At all levels of income inequality, areas with higher inequality have a higher percentage of respondents that required care but did not receive it. While not statistically significant, the findings indicate support for the Wilkinson hypothesis at all levels of income for a very key functioning measure. It would indicate that inequality is negatively affecting health capabilities through impeding access to necessary care.

Those regions that had a higher urbanization rate had a lower percentage of people reporting a recent health problem; the relationship was moderately negative and statistically significant. Regions with a lower percentage of urban respondents had a higher percentage reporting not utilizing health care ($r = -0.79$, $p < 0.01$). This indicates that regions that were more urban had a lower percent of participants reporting not having utilized care. This finding is supportive of the rural hypothesis. Lower urbanization is correlated with a higher percentage of recent health problems and higher likelihood of not utilizing health care within the past three months. For unmet needs, the relationship was extremely weak and not significant. With regards to health problems and health care utilization, my findings support previous literature indicating that those who live in rural areas are more likely to not have access to health care (Barrientos 2000; Borzutzky 2006).

Finally, for the percentage with public insurance none of the correlations for the functionings measures were statistically significant. Interestingly, both the percentage of respondents that had a recent health problem and the percentage that did not utilize health care have moderately strong positive correlations (0.54 and 0.51, respectively). This finding indicates that in regions with higher percentages of respondents with public insurance there were higher rates of both recent health problems and non-utilization of care. For unmet needs, the relationship was weak and negative, though still not statistically significant. Those regions with higher rates of public insurance were less likely to have respondents reporting not receiving needed care. This contrasts with the findings at the individual level of respondents who had public insurance being more likely to report unmet needs. This indicates the importance of keeping in mind the ecological fallacy. This is because it would be a fallacy to say that those who have public insurance are less likely to have unmet needs, just based on the regional data. Even though regions with a higher percentage of respondents with public insurance also had a lower percentage of respondents who had unmet needs, the findings at the individual level were the opposite, with individuals with public insurance being *more* likely to experience unmet needs.

These findings paint a story of serious inequality in health outcomes and access to health care. Massive overhauls to the system of wealth and income, such as land reform, face significant difficulties due to limitations imposed by international bodies, foreign lenders, and the ruling classes. However, such revolutionary reforms are unlikely due to the consensus in Chile of focusing on

softening the effects of neoliberal policy as opposed to reversing it (Hira and Sanghera 2004). Also, the possibility of being cut off from foreign lending and capital flight makes large scale reforms less likely (Stiglitz 2002). This limits the autonomy of Chile and therefore the steps that the government can take to improve the lives of Chileans. However, there are still many possible ways to address the effects of inequality on health and to address inequality directly (Hamilton 1982). One policy currently under debate in Chile is the creation of a health solidarity fund (Borzutzky 2006; Homedes and Ugalde 2005). Under this Concertación backed policy, some part of the mandatory seven percent of income Chileans pay to health care, either public or private, would instead be put into a separate fund. This fund would be used to target care expenditures in the areas that are not now receiving the highest levels of care, particularly the poor and those in underserved rural areas. A similar program was found to be successful in Colombia (Homedes and Ugalde 2005) and was proposed as a possible reform as a part of the AUGE plan, a set of recent health reforms, in Chile (Borzutzky 2006).

Further discussion of policy implications based on my findings would be premature. The complex relationship found between income inequality and health requires further study to understand how other factors, such as class, ethnicity, and objective health measures interact with the relationships explored here. Engagement with these factors and others would give a better idea how the effects of inequality on health can be mitigated and how inequality itself can be

reduced. This study provides an important first step by examining central factors in light of the larger political context of Chile.

Limitations

This study examined the relationship through secondary analysis and thus any problems present in the collection of the data would be carried forth into the analysis (De Vaus 2002). While some useful functioning measures were found and examined in this study, the limitations of the CASEN made analysis of other key functioning and capabilities measures not possible. Measures of “objective” health status such as blood pressure, cholesterol levels, and other factors would have been interesting to examine as well. One area where this sort of research is being carried out is through the PAHO/WHO Stepwise Approach to Chronic Noncommunicable Disease Risk-Factor Surveillance (STEPS). The goal of the project is to create standardized and comparable data sets for countries in North and South America. Researchers and governments could then use this data for improving health policy and interventions. The third step of the process includes collecting and analyzing blood samples and other medical test to identify risk factors (WHO 2008). However, STEPS is an expensive process and the required tests raise the risks of various complications associated with diagnostic medicine (Garrett 2000).

Examining the country in units smaller than regions could allow for a more nuanced account of how income inequality and health are related. It is possible that the regions are too diverse to allow the observation of some patterns. An analysis at the provincial or municipal level may lead to the identification of

patterns that are not found at the regional level. A follow-up study could explore this using a similar methodology.

Another limitation in the study is the way relevant capabilities and functionings were chosen. Sen proposes that the best way to achieve consensus on appropriate capabilities and functionings, as well as their relative weight, is through an open and democratic process (Sen 1999). In this study however, the individuals who developed the CASEN constructed the questions, though I chose the final factors for analysis. While Sen's notion may be the ideal way of creating a quantitative "index" of fundamental capabilities and functions, it faces significant difficulties. First, it is difficult to define how the process would be carried out. This is largely because of differential access of actors to types of discourse. If it is carried out through academic debate in journals and conferences, it would likely miss a vast array of views from social actors that are unable to engage with this type of literature. Also problematic would be an open forum among citizens within a country because of the relations of power that construct participation in such a process (Paley 2004). Similarly, the most marginalized and capability-deprived individuals would be those that would not be able to adequately participate in either of these situations.

This notion of creating a "complete" index relies on the quantitative side of those who utilize the capability approach (Gaertner and Xu 2006; Lelli 2005). Those who are more directed toward utilizing the capability approach for qualitative purposes would argue that this notion of creating such an index would be flawed and could never be "complete" (Frediani 2007; Zimmermann 2006).

Finding a balance between creating comparative measures that still allow for adequate nuance and complexity is a crucial challenge for researchers creating operational definitions.

Participatory action research is one possible method of dealing with this particular limitation (Reitsma-Stree and Brown 2004). Through participatory action research, it would be possible to engage with communities and allow them to inform and develop the research. This could be an important opportunity through which marginalized populations would be able to play a part in the research process and have their voices heard. This would be particularly useful for the capability approach as it would allow for a better understanding of how different marginalized communities perceive and weigh the importance of particular functionings and capabilities. Using this method as a further study would allow a better understanding of how particular communities place value on capabilities and functionings. Yet, this approach may make more aggregated levels of analysis difficult.

CHAPTER 7: CONCLUSION

The relationship between income inequality and health remains controversial (Lynch et al. 2004). This project emphasizes that the choice of measures used to examine health and inequality have profound implications, and different measures may yield different results. Drawing from the work of Sen, I suggest that functionings represent an interesting opportunity to examine achieved health outcomes. Through analysis of these functionings, a better understanding of the capabilities that people experience may be reached. This project examined different operational definitions that can be used to examine functionings. The key is not to lose sight of the purpose of measuring functionings. Though comparability with measures from other countries is a useful goal, examining non-standard operationalizations of health can still yield useful results that can be useful for public policy formation. Using these alternative operationalizations also allows different accounts of specific functionings while still providing links to larger issues of access to health (Sen 1999).

Using the capability approach in conjunction with the Wilkinson hypothesis has provided a more nuanced way of measuring health outcomes. Also, the capability approach extends the implications of the Wilkinson hypothesis by focusing on the substantive freedom to have good health. Further studies could use these two perspectives in conjunction to speak to larger issues of

development while not overstepping their particular findings. In this study, larger issues of class, power, and politics in Chile were engaged with theoretically, though not empirically. However, engaging with this context serves to strengthen the empirical analysis by giving a better idea where this particular study fits in the larger literature on development.

Chile has found some success in reversing the devastating effects of the damage done to the health system under the Pinochet dictatorship (Borzutzky 2006). Spending on both health care and public health has experienced a large increase. Also, health care has been expanded to include many that did not have access under the Pinochet regime (Barrientos 2000; Borzutzky 2006). However, important challenges remain to providing a health care system that provides well for all Chileans, not just those who can afford quality care. While some aspects of policies that have been implemented represent a step in the right direction in addressing health inequality, others may actually increase health inequalities (Barrientos 2000; Letelier and Bedregal 2006). It is not enough to have just direct health interventions. The massive inequalities in wealth and income experienced in Chile also need examination and policy intervention (Wermuth 2003). The underlying income inequalities play a role not only in health through ability to afford care, but through the psychosocial and social capital pathways proposed in the Wilkinson hypothesis (Wilkinson 1996).

This project has continued the dialogue on inequality and health by extending previously asked questions in new directions and has found some interesting and complex answers. The complex and sometimes contradictory

relationship between income inequality and health found throughout the analysis indicates that there is still much to be done. Based on this study's data and analysis, it would be as premature to discount the Wilkinson hypothesis as it would be to accept it. As further analyses are done the contours of this relationship will likely become more visible and its implications more clearly understood. Though the complexity of the statistics and the focus on numerical results predominate in a secondary analysis, it is the individual Chileans that are the focus of the project. Hopefully, the answers generated to the research questions can provide a starting point for addressing sustained inequalities and furthering efforts to mitigate the effects of inequality on health outcomes.

APPENDICES

Appendix A

The Central Human Capabilities

1. *Life*. Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.
2. *Bodily Health*. Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.
3. *Bodily Integrity*. Being able to move freely from place to place; to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.
4. *Senses, Imagination, and Thought*. Being able to use the senses, to imagine, think, and to reason—and to do these things in a “truly human” way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to have pleasurable experiences and to avoid non-beneficial pain.
5. *Emotions*. Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)
6. *Practical Reason*. Being able to form a conception of the good and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.)
7. *Affiliation*.
 - A. Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another. (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political speech.)
 - B. Having the social bases of self-respect and non-humiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails

provisions of non-discrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin.

8. *Other Species*. Being able to live with concern for and in relation to animals, plants, and the world of nature.
9. *Play*. Being able to laugh, to play, to enjoy recreational activities.
10. *Control over One's Environment*.
 - A. *Political*. Being able to participate effectively in political choices that govern one's life; having the right of political participation and protections of free speech and association.
 - B. *Material*. Being able to hold property (both land and movable goods), and having property rights on an equal basis with others; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with other workers.

Source: Nussbaum 2006

Appendix B

Definition of Key Terms

Unfreedoms – significant obstacles (e.g., racism, sexism, or various forms of deprivation) that negatively affect individuals' well-being or the ability to create a life they value (Sen 1999)

Substantive/positive freedoms – the freedom to do or have something (e.g., freedom to have basic health care) (Sen 1999).

Negative freedoms – freedom from something (e.g., freedom from imprisonment without due process) (Sen 1999).

Capabilities – substantive freedoms that enable an individual to achieve particular functionings (e.g., access to sufficient food and water) (Sen 1999).

Functionings – something that a person values being or doing. Basic functionings include things such as having enough food to eat or having basic medical care. More complex functionings would include having sufficient self-respect (Sen 1999).

Capability Approach – an evaluative approach put forth by Amartya Sen that emphasizes that development should be judged by substantive freedoms as opposed to measures of income (Sen 1999)

Wilkinson's income inequality hypothesis – a hypothesis developed by Richard Wilkinson that posits that high inequality leads to worse health outcomes than for societies that have less inequality (Wilkinson 1996)

Neoliberalism – a hegemonic paradigm that emphasizes the liberalization of markets. Also places a de-emphasis on the social welfare state. It also recommends private solutions to problems and places responsibility for taking care of problems with the individual (Stiglitz 2002)

Neoliberal institutions – groups or institutions that either adopt neoliberalism as their dominant guiding principle or that promote the principles of neoliberalism through their actions.

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