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**Chronic diseases in Italy: Does
socioeconomic status carry
weight?**

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Chronic diseases in Italy: Does socioeconomic status carry weight?

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Abstract

We estimate income-related inequality in chronic patients in Italy and analyze its dynamics over time. Data come from the 2005, 2005, and 2013 waves of the Indagine Multiscopo sulle Famiglie, Condizioni di salute e ricorso ai servizi sanitari”, carried out by ISTAT. Results show an increase over time in chronic disease prevalence, higher for women than for men. This study provides evidence for chronic conditions inequalities in Italy. Indeed, chronic conditions are concentrated among poor people. In particular, over time, the prevalence of chronicity did not reduce for poor people, while it increased in richer people.

Keywords: chronic conditions, socioeconomic status, inequality, concentration index, Italy

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1. INTRODUCTION

There are many studies in previous literature that analyzed the sources of socioeconomic status (SES) in relation with inequality in health and how this inequality evolved over time (Chatterji, Lahiri, & Song, 2013). In particular, most of the studies employed the concentration index (CI) to capture the degree to which inequality in health status is associated with inequality in SES (Chatterji et al., 2013; Wagstaff & Van Doorslaer, 2000), especially when longitudinal data are available (Allanson, Gerdtham, & Petrie, 2010) in order to detect "whether the health of the poor is improving or worsening over time relative to that of the rich" (Chatterji et al., 2013, p. 623).

In this study, we estimate income-related inequality in chronic Italian patients and we analyze its dynamics using data from 2000, 2005, 2013 waves of the survey "Indagine Multiscopo sulle Famiglie, Condizioni di salute e ricorso ai servizi sanitari", carried out by ISTAT.

The ageing population trend is increasing and this is becoming relevant to the occurrence of the management of chronic diseases that, in turn, should be considered in a context of continuously rising costs of healthcare (Andersen & Gudnason, 2012; Horton, 2005; Rothenberg & Kaplan, 1990). The incidence of chronic diseases is dramatically increasing (Andersen & Gudnason, 2012; Horton, 2005) and the trend is not likely to change spontaneously in the near term (Rothenberg & Kaplan, 1990). Thus, the rise of chronic conditions forces healthcare systems to continuously operate in a context of increasing costs (Andersen & Gudnason, 2012; Horton, 2005; Rothenberg & Kaplan, 1990). According to previous studies, the organization and delivery of healthcare will be largely impacted by the ageing of the population. In particular, this is translated into a shift from the prevalence of acute to chronic illnesses (Wiener & Tilly, 2002). According to the World Health Organization (WHO) the 68% of all the deaths in 2014 was caused by chronic diseases (World Health Organization, 2015), which are the main responsible for morbidity, disability and mortality (Marcelli et al., 2017). Therefore, it is important to prevent chronic diseases in order to avoid social and economic costs to increase, and, when prevention is not possible, to study their trends (Chan, 2011; Marcelli et al., 2017).

In particular, in Italy, more than 2 million people live in conditions of disability, which testifies that a radical change in the epidemiological conditions of Italians has been detected in the last years (Massucci et al., 2010). Since chronic conditions are expected to increase with the population aging, Italy, that is the country with the biggest European population over the age of 65 (Massucci et al., 2010), has the necessity to adopt new approaches to healthcare management system to tackle the increasing demand.

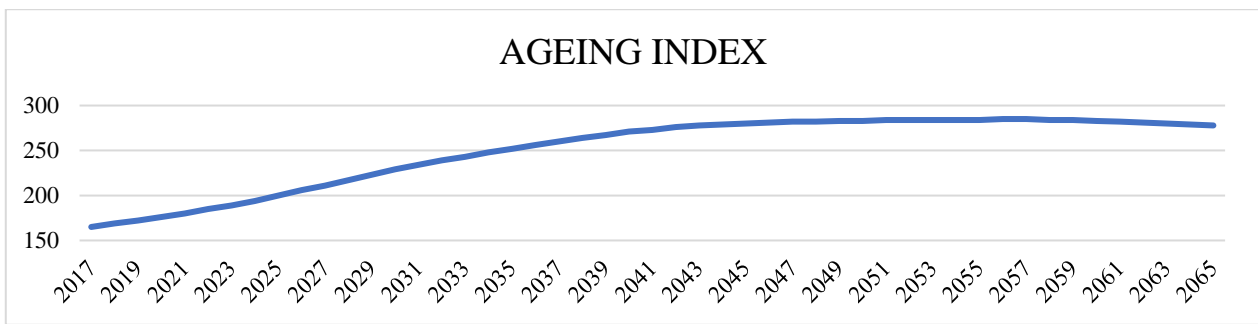


Figure 1: Ageing index for the Italian population

Source: Available at: http://dati.istat.it/Index.aspx?DataSetCode=DCIS_INDDEMOG1&Lang

As shown in Figure 1, the ageing index for the Italian population (calculated as the ratio between the population aged 65 and over and the population aged between 0 and 14 years (ISTAT, 2008)) demonstrate that the proportion of elder people compare to young people is expected to increase dramatically in the next years.

In addition, chronic conditions is often referred to a more complex clinical condition, since a chronic patient is exposed to a multidimensional phenomenon that could be characterized by different levels of severity (Von Korff, Ormel, Keefe, & Dworkin, 1992).

Due to the relevance of the topic, understanding the patterns of determinants of chronic conditions is fundamental for the development of health policies able to support the sustainability of the health systems.

In addition to that, previous studies largely support the influence from health to wealth (e.g. Benzeval & Judge, 2001; Ettner, 1996; Marmot, 2002). As provided in previous literature, poorer people, less educated and with lower social status are more exposed to the risk of suffer from poor health (Bayer, Gostin, Jennings, & Steinbock, 2006).

Despite the literature is clear in supporting a relationship between health and wealth, previous studies also stated that they are mutually determined (Bayer et al., 2006) and that the direction of the relationship between the two variables is not clear (e.g. Deaton, 2002; Kahneman & Deaton, 2010).

In particular, only few studies have compared socioeconomic inequalities in the prevalence of chronic conditions (e.g. Hayward, Crimmins, Miles, & Yang, 2000). Therefore, further research is needed to understand which are the socioeconomic characteristics that may affect the emergence of chronic conditions. In particular, while previous studies have analyzed the impact of chronic conditions on disease specific outcomes, there is a lack of studies analyzing the trend of different chronic conditions.

Indeed, the majority of the studies, in fact, are focused only on one specific conditions, without considering the bigger picture of the trend of chronic diseases (Megari, 2013).

2. OBJECTIVES

This study is aimed at analyzing the concentration of chronic diseases among socioeconomics classes. In particular, this study first analyzes the evolution of prevalence for different type of chronic disease, and, second, by computing the concentration index for chronic condition, it aims at analyzing the concentration of the disease across different socio economic classes.

In particular, differences across diseases will be considered. Consistently with previous studies (e.g. Dworkin, White, O'Connor, Baser, & Hawkins, 2007; SIN & TU, 2001), the severity of the diseases has been considered as a discriminating factor.

In addition, with reference to demographic conditions, more specifically, geographical area, and sex are investigated. First, since in Italy the income differences across regions are significant, this study aims at analyzing whether the diffusion of chronic conditions differ significantly across Italian regions (Beretta & Crea, 2020). Second, this study will investigate whether there are differences in the chronic disease distribution across gender (Erving & Frazier, 2019; Manne & Zautra, 1990; Raghavan, Varkey, & Bartter, 2017).

3. DATA AND METHODS

3.1. DATA COLLECTION

The survey “Indagine Multiscopo sulle Famiglie, Condizioni di salute e ricorso ai servizi sanitari”, carried out by ISTAT is used to perform the analysis (ISTAT, 2016). This survey is based on direct interviews on a representative sample of Italian households living all over Italy. It allows to capture citizens' needs in terms of health and quality of life, providing a wide range of information on the spread of chronic diseases, on the perceived health, conditions of disability, lifestyles and prevention, use of health services by delineating an articulate overview of the population health, prevention, and access to healthcare services. The survey is part of an integrated system of social investigations that are aimed at collecting information directly from citizens in order to provide useful tools to improve health planning, both at national and local level. The main topics investigated are acute and chronic diseases, certain types of disability, conditions of disability, lifestyles, prevention, general assessment of health status, participation in social life, the citizen's contact with health services, the use of

unconventional drugs and therapies, and, finally, aspects related to the birth event (pregnancy, childbirth and breastfeeding).

Despite data have been collected through this survey starting from 1994, for the purposes of this study, in order to ensure consistency of the questions and comparability of the results, the years 2000, 2005 and 2013 have been considered. Therefore, the year 1994 has not been included for the difference in some of its questions compared to the following years.

3.2. VARIABLES OF INTEREST

The variables included in the analysis are discussed below.

Chronic conditions

Only diagnosed chronic conditions have been considered in the analysis. In the survey used for the data collection there is a section dedicated to the health conditions of individuals, where chronic conditions that are diagnosed by a doctor are detected. The dummy variable "Chronic" has been created with reference to this section: 1 for respondents affected by at least one chronic disease, 0 otherwise.

Consistently with previous studies (Bossola et al., 2010; McGregor & Brophy, 2005), the severity of the chronic condition has been measured by using the Charlson comorbidity index. This validated index is a weighted average used to categorize comorbidities of patients based on the International Classification of Diseases (ICD) diagnosis codes (D'Hoore, Bouckaert, & Tilquin, 1996; Quan et al., 2005). In order to disentangle the differences in the severity of the chronic diseases, two groups have been created. A dummy variable called "Severity_High" has been created and it has the value 1 if the Charlson Index is higher or equal than 2, 0 otherwise. A dummy variable called "Severity_Low" has been created and it has the value 1 if the Charlson Index is lower than 2, 0 otherwise¹.

Demographic characteristics

The sample has been analyzed in terms of sex and geographic area in which the respondent resides. Details about the construction of the variables related to the demographic characteristics are provided in Table 1.

¹ Despite other studies (e.g. Hayward et al., 2000) differentiated the chronic conditions according to their fatality (fatal and non fatal diseases), we obtained similar results between that classification and the one with the Charlson comorbidity index. We decided to adopt the classification according to the severity of the disease because of its relevance in the Literature.

Sex	<p>Female is a dummy variable equal to 1 if the sex of the respondent is female, 0 otherwise.</p> <p>Male is a dummy variable equal to 1 if the sex of the respondent is male, 0 otherwise.</p>
Area Geo	<p>North is a dummy variable equal to 1 if the geographic area in which the respondent resides is Piemonte, Valle d'Aosta, Liguria, Lombardia, Trentino-Alto Adige, Veneto, Friuli-Venezia Giulia, or Emilia-Romagna, 0 otherwise.</p> <p>Centre is a dummy variable equal to 1 if the geographic area in which the respondent resides is Toscana, Umbria, Marche, or Lazio, 0 otherwise.</p> <p>South is a dummy variable equal to 1 if the geographic area in which the respondent resides is Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, or Sardegna, 0 otherwise.</p>

Table 1: Demographic characteristics variables

Socioeconomic conditions

As suggested by previous studies (e.g. Kolenikov & Angeles, 2009; Tajik & Majdzadeh, 2014), when a direct measure of the socioeconomic status of individuals is not available, the principal component analysis (PCA) is implemented in order to derive an index for wealth, by generating scoring weights for each variable (Vyas & Kumaranayake, 2006). Consistently with previous studies (e.g. Di Novi, Jacobs, & Migheli, 2018), along with this study, this one-dimensional index of wealth arises from information related to the property assets, education, employment and living standards collected in the survey (Vyas & Kumaranayake, 2006).

3.3. EMPIRICAL ANALYSIS

First, descriptive statistics are performed in order to analyze the prevalence of chronic diseases and their trends over the analyzed years.

Second, the Wagstaff and van Doorslaer concentration index (Wagstaff & Van Doorslaer, 2000) gained in the last years popularity as indicator of health inequality with respect to the socioeconomic conditions of individuals (Koolman & Van Doorslaer, 2004). However, more recent studies underlined that it is not a perfect measure for a variety of reasons, among which the extent to which

it is dependent upon the mean of health variables (Clarke, Gerdtham, Johannesson, Binglefors, & Smith, 2002; Erreygers, 2006; Wagstaff, 2005). Along with this study, the Wagstaff and van Doorslaer concentration index has been adopted with the correction proposed by Erreygers (Erreygers, 2009). In particular, the index is computed for each available year, in order to observe if the concentration in chronic disease prevalence change over the time.

4. RESULTS

4.1. CHRONIC DISEASES PREVALENCE

	2000	2005	2013
Chronic	43%	45%	49%
Severity_Low	34%	35%	38%
Severity_High	9%	11%	11%
<i>N. Obs</i>	<i>115.019</i>	<i>105.844</i>	<i>99.479</i>

Table 2: Chronic diseases prevalence

Results of this study show that, in 2000, 43% of respondents were affected by chronic conditions, while, in 2013, the 49% presents chronic diseases². Of this percentage, the great majority is affected by low severity chronic conditions. Table 2 shows also that the prevalence of chronic disease increased over time. In particular, low severity chronic diseases increased more than high severity chronic diseases even if chronic patients with high severity increased more in relative terms (an increase of 11,8% for chronic low severity and a 22.2% for chronic high severity in the period 2005 - 2013).

	2000	2005	2013
Prevalence in subsample Female			
Chronic	49%	51%	54%
Severity_Low	39%	40%	42%
Severity_High	10%	11%	12%
<i>N. Obs</i>	<i>59.716</i>	<i>55.392</i>	<i>52.155</i>

² The increase in prevalence for single disease are presented in Appendix A.

Prevalence in subsample Male			
Chronic	37%	40%	43%
Severity_Low	29%	29%	33%
Severity_High	8%	10%	10%
N. Obs	55.303	50.452	47.324

Table 3: Chronic diseases prevalence for female and male

Table 3 shows that, considering the differences across sex, female are more chronic than male in all the years of analysis for both high severity and low severity chronic diseases.

	2000	2005	2013
Prevalence in subsample North			
Chronic	44%	47%	50%
Severity_Low	35%	37%	40%
Severity_High	8%	10%	10%
N. Obs	46.212	44.337	42.112
Prevalence in subsample Centre			
Chronic	45%	49%	50%
Severity_Low	35%	37%	39%
Severity_High	10%	12%	11%
N. Obs	20.472	19.157	17.829
Prevalence in subsample South			
Chronic	42%	42%	47%
Severity_Low	32%	31%	36%
Severity_High	10%	11%	12%
N. Obs	48.335	42.350	39.538

Table 4: Chronic diseases prevalence for North, Centre and South

In terms of geographic area, results presented in Table 4 show that, over time, there has been a stable increase in the prevalence of chronic diseases in all the areas analyzed. In particular, a higher increase has been registered in the south after the 2005, compared to the Centre and the north where the increase in prevalence is more constant over time. Low severity chronic diseases increased especially

in the northern part of Italy, while high severity chronic diseases showed a decrease in their prevalence from 2005 to 2013 in the centre of Italy.

4.2. Chronic diseases concentration index

Concentration Index						
	2000		2005		2013	
	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>
Chronic	-0,135***	0,0033	-0,106***	0,0035	-0,080***	0,0036
Severity_Low	-0,066***	0,0032	-0,034***	0,0033	-0,015***	0,0035
Severity_High+	-0,069***	0,0019	-0,072***	0,0022	-0,064***	0,0023
<i>N. Obs</i>	115.019		105.844		99.479	

+The change in concentration index for Chronic severe is significant only at $p = 0,10$

Table 5: Chronic diseases concentration index

The analysis of the concentration index presented in Table 5 shows that there is inequality in the prevalence of chronic diseases in Italy, since chronic conditions are always concentrated towards poorer people, especially when they are severe³. In particular, the concentration towards poorer people is higher in 2000 with respect to the other periods of analysis. The concentration of low severity chronic conditions has dramatically decreased overtime, meaning that the low severity chronic conditions are less concentrated towards poorer people. On the contrary, the concentration of high severity chronic conditions remains stable over time, since the change in concentration index for Chronic high severity is significant only at $p = 0.10$.

	2000		2005		2013	
	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>
Concentration in subsample Female						
Chronic	-0,151***	0,0047	-0,132***	0,0049	-0,102***	0,0050
Severity_Low	-0,076***	0,0046	-0,053***	0,0048	-0,026***	0,0050
Severity_High+	-0,075***	0,0019	-0,079***	0,0022	-0,076***	0,0023

³ The increase in prevalence for single disease are presented in Appendix B.

<i>N. Obs</i>	59716		55392		52155	
Concentration in subsample Male						
Chronic	-0,102***	0,0047	-0,062***	0,0050	-0,041***	0,0052
Severity_Low	-0,043***	0,0044	-0,001	0,0046	-0,008	0,0050
Severity_High	-0,059***	0,0026	-0,063***	0,0031	-0,049***	0,0031
<i>N. Obs</i>	55.303		50.452		47.324	
+ The change in concentration index for Chronic severe is not significative						

Table 6: Chronic diseases concentration index for Female and Male

Considering the differences per sex, results in Table 6 show that chronic conditions are concentrated especially towards poorer women, especially in 2013. The concentration for female with severe conditions do not present a significative change over the analyzed years. In addition, there has been a strong reduction of concentration towards poorer men from 2000 to 2013. Differently from severe conditions, that remained constantly slightly concentrated towards poorer individuals over time, there is not inequality in the distribution of non-severe chronic conditions in 2005 and 2013.

Concentration in subsample North						
	2000		2005		2013	
	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>
Chronic	-0,141***	0,0053	-0,113***	0,0054	-0,080***	0,0056
Severity_Low	-0,084***	0,0051	-0,045***	0,0052	-0,021***	0,0054
Severity_High+	-0,056***	0,0029	-0,067***	0,0032	-0,059***	0,0034
<i>N. Obs</i>	46.212		44.337		42.112	
Concentration in subsample Centre						
Chronic	-0,165***	0,0079	-0,126***	0,0082	-0,090***	0,0086
Severity_Low	-0,086***	0,0076	-0,045***	0,0080	-0,023***	0,0084
Severity_High+	-0,079***	0,0048	-0,080***	0,0054	-0,067***	0,0054
<i>N. Obs</i>	20.472		19.157		17.829	
Concentration in subsample South						
Chronic	-0,125***	0,0051	-0,106***	0,0055	-0,084***	0,0057

Severity_Low	-0,052***	0,0049	-0,035	0,0051	-0,019	0,0055
Severity_High	-0,072***	0,0030	-0,070***	0,0035	-0,064***	0,0037
N. Obs	48.335		42.350		39.538	
+ The change in concentration index for Chronic severe is not significative						

Table 7: Chronic diseases concentration index for North, Centre and South

Finally, considering the different geographic areas of the sample, Table 7 shows that, in 2000, chronic diseases are concentrated towards poorer people in all the areas investigated. Nevertheless, over time, the concentration has been reduced much more in the North compared to the Centre and South. More specifically, the Centre of Italy is the area in which the concentration towards poorer people remained higher over time.

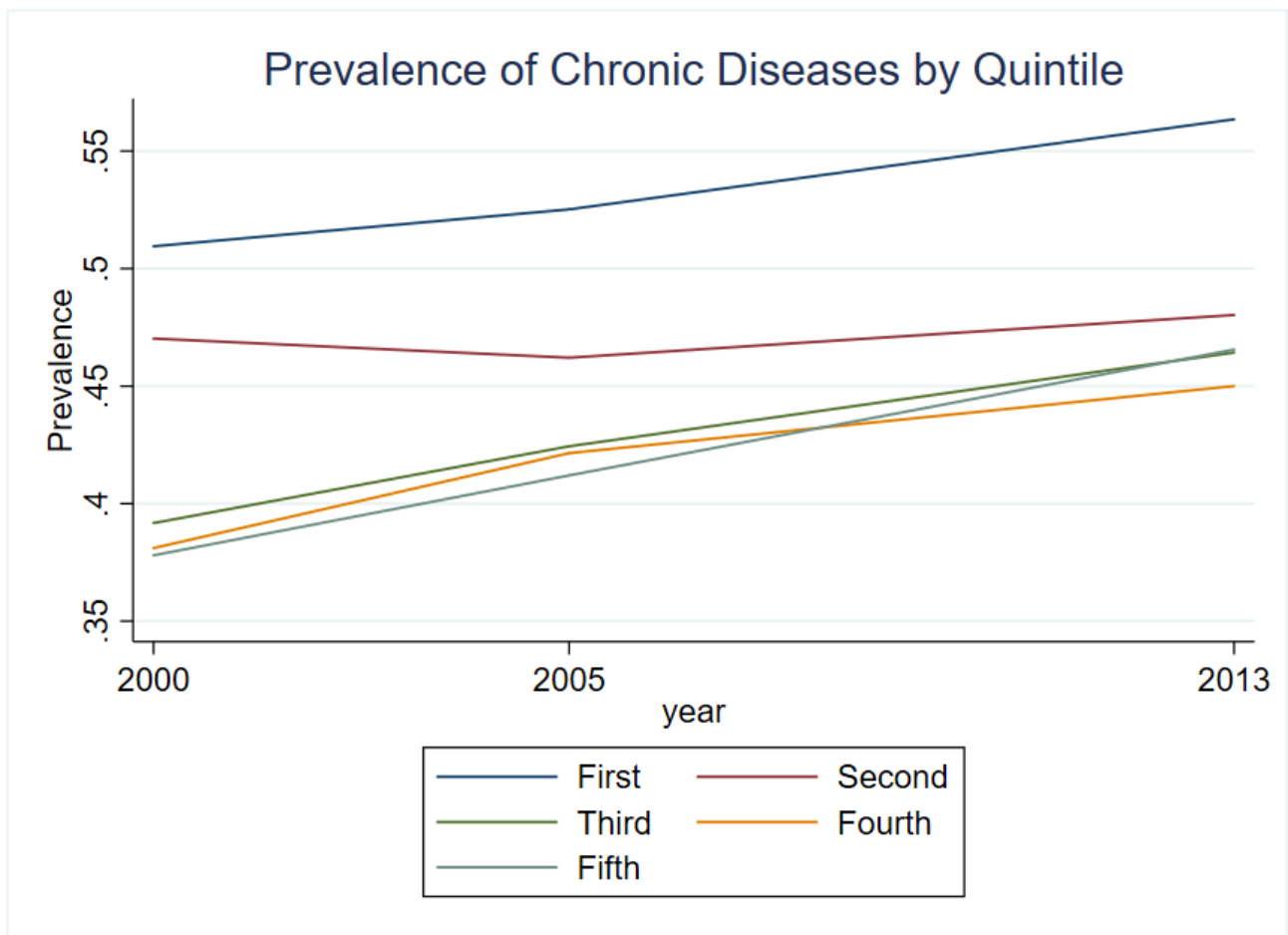


Figure 2: Chronic diseases prevalence per quintile

Figure 2 represents the prevalence of chronic diseases by quintile. It shows that, while despite the first and the second quintile are always those with the highest prevalence, meaning that poorer people are those more heavily affected by chronic conditions, the prevalence of chronic conditions for people in the fifth quintile is increasing, and it is overcoming the prevalence of chronic conditions in the third and in the fourth quintile. This trend is better explained in Table 8, which shows that the prevalence of chronicity has increased over time especially for individuals in the fifth quintile (richer people), and especially for severe chronic conditions. This result explains that inequality decreased because, over time, the difference in prevalence among quintile decreased due to the increase in higher quintile that is bigger than the lower one.

	2000	2005	2013		2005-2000 (% change)	2013-2005 (% change)	2013-2000 (% change)
First quintile							
chronic	50,95%	52,52%	56,35%		1,57% (3,08%)	3,83% (7,29%)	5,40% (10,60%)
Severity_Low	38,18%	37,75%	40,73%		-0,43% (-1,13%)	2,98% (7,89%)	2,55% (6,68%)
Severity_High	12,77%	14,77%	15,62%		2,00% (15,66%)	0,85% (5,75%)	2,85% (22,32%)
Second quintile							
chronic	47,02%	46,21%	48,03%		-0,81% (-1,72%)	1,82% (3,94%)	1,01% (2,15%)
Severity_Low	35,76%	33,98%	35,93%		-1,78% (-4,98%)	1,95% (5,74%)	0,17% (0,48%)
Severity_High	11,26%	12,23%	12,10%		0,97% (8,61%)	-0,13% (-1,06%)	0,84% (7,46%)
Third quintile							
chronic	39,17%	42,44%	46,43%		3,27% (8,35%)	3,99% (9,40%)	7,26% (18,53%)
Severity_Low	32,31%	33,27%	37,10%		0,96% (2,97%)	3,83% (11,51%)	4,79% (14,83%)
Severity_High	6,86%	9,17%	9,33%		2,31% (33,67%)	0,16% (1,74%)	2,47% (36,01%)
Fourth quintile							
chronic	38,10%	42,15%	45,00%		4,05% (10,63%)	2,85% (6,76%)	6,90% (18,11%)
Severity_Low	31,20%	33,19%	36,44%		1,99% (6,38%)	3,25% (9,79%)	5,24% (16,79%)

Severity_High	6,90%	8,96%	8,56%		2,06% (29,86%)	-0,40% (-4,46%)	1,66% (24,06%)
Fifth quintile							
chronic	37,80%	41,20%	46,56%		3,40% (8,99%)	5,36% (13,01%)	8,76% (23,17%)
Severity_Low	31,57%	34,03%	38,23%		2,46% (7,79%)	4,20% (12,34%)	6,66% (21,10%)
Severity_High	6,23%	7,17%	8,33%		0,94% (15,09%)	1,16% (16,18%)	2,10% (33,71%)

Table 8: Chronic diseases prevalence per quintile

5. DISCUSSION

Results of this study show an increase over time in chronic disease prevalence. This provides support for that stream of the literature according to which there has been an increase over time in the occurrence of many chronic conditions (Crimmins & Saito, 2000; Freedman, Schoeni, Martin, & Cornman, 2007; Martin, Freedman, Schoeni, & Andreski, 2010; Paez, Zhao, & Hwang, 2009).

Consistently with previous studies (Erving & Frazier, 2019; Manne & Zautra, 1990; Raghavan et al., 2017), the prevalence of chronic illness is higher for women than men, as well documented in literature, while the increase in relative term is bigger for men. Thus, this study is aligned with that stream of the literature according to which poorer people are more exposed to the insurgence of diseases (Chatterji et al., 2013). Considering the study of Chatterji et al., results provide some relevance for an increase in the prevalence of chronic condition because "the health of the poor is worsening [...] over time", but, at the same time, even the health of the rich is worsening as well (Chatterji et al., 2013, p. 623).

Results show also that the increase in the prevalence of chronic conditions has been led by the increase of some specific diseases. In particular, as argued in previous studies, this could be explained by the improvement in the earlier diagnosis and screening, which, in turn, are more likely to reduce the severity of chronic illness (Cutler, Landrum, & Stewart, 2006; Martin et al., 2010; Schoeni, Freedman, & Martin, 2008).

Consistently with previous studies, results provide support to that stream of the literature stating that there is concentration of chronic conditions among poor people (Bayer, Gostin, Jennings, & Steinbock, 2006). However, this study provides also evidence for a decreasing trend of this concentration. In particular, the only exception that has been registered for this trend regards the concentration of severe chronic conditions for female, for which inequality towards poorer

individuals is constant over time. On the other side, results do not provide support for concentration of non severe chronic conditions for male.

7. CONCLUSION

This study contributes at the current literature in different ways.

First of all, it provides an analysis of the trends and of the concentration of chronic diseases in Italy in the period 2000 - 2013 by considering also differences in terms of gender and geographic areas.

Second, by adopting the Charlson index (D'Hoore et al., 1996) this study advances some knowledge related to the differences among chronic diseases according to their severity have been analyzed. In particular, this study contributes in the understanding of the trends and prevalence of chronic conditions with different degrees of severity.

In common with applied research more generally, this study is not without limitations.

First of all, despite it has been widely used in the literature (e.g. Kolenikov & Angeles, 2009; Tajik & Majdzadeh, 2014), this study suffers of the limitations associated with the adoption of the PCA to construct a socioeconomic index. Therefore, further research could consider the adoption of directly observable measures as socioeconomic variables.

Second, only a restrict set of diseases has been considered in the analysis. In particular, only diagnosed chronic conditions have been retained in the sample. Nevertheless, further research could be conducted in order to analyze differences between self reported and diagnosed diseases.

Finally, despite the adoption of the Charlson index is appropriate for the purposes of our study, future studies could consider the adoption of information related to the complications for defining the severity of the condition.

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APPENDIX

Appendix A - Prevalence for single disease

Prevalence for single disease (%)			
	2000	2005	2013
Allergy	8,5	8,3	9,7
Diabetes	4,4	5,5	7,1
Hypertensin	14	16,8	21,4
Heart attack	1,4	2,1	2,4
Angina pectoris	1	0,8	0,8
Other heart dis.	4	3,8	4,8
Thrombosis	1	1,4	1,8
Chronic bronchitis	5,3	5,5	4,5
Asthma	3,2	3,7	4,3
Thyroid	3,4	4,1	6,2
Arthrosis	21,4	22,2	19,4
Osteoporosis	5,4	6,4	8,9
Cirrhosis	0,2	0,3	0,3
Tumors	1	1,1	1,9
Chronic headache	6,6	7	6,7
Alzaimer and parkinson	1,1	0,8	1,5
Depression	3,4	5,7	4,1
<i>N. Obs</i>	<i>115.019</i>	<i>105.844</i>	<i>99.479</i>

Appendix B - Concentration Index for single disease

Concentration Index for single disease						
	2000		2005		2013	
	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>	<i>Index value</i>	<i>Std. error</i>
Allergy +	0,026***	0,0019	0,027***	0,0019	0,025***	0,0022
Diabetes	-0,036***	0,0014	-0,039***	0,0016	-0,046***	0,0018
Hypertension+	-0,079***	0,0023	-0,074***	0,0026	-0,073***	0,0030
Heart attack +	-0,009***	0,0007	-0,009***	0,0010	-0,010***	0,0010
Angina pectoris +	-0,006***	0,0007	-0,005***	0,0006	-0,005***	0,0007
Other heart dis.	-0,026***	0,0013	-0,023***	0,0014	-0,020***	0,0016
Thrombosis	-0,005***	0,0007	-0,006***	0,0008	-0,009***	0,0010
Chronic bronchitis	-0,038***	0,0015	-0,041***	0,0016	-0,028***	0,0015
Asthma	-0,017***	0,0012	-0,012***	0,0013	-0,009***	0,0015
Thyroid	-0,010***	0,0012	-0,006***	0,0014	-0,001***	0,002
Arthrosis	-0,140***	0,0027	-0,127***	0,0029	-0,105***	0,0028
Osteoporosis	-0,036***	0,0015	-0,043***	0,0017	-0,053***	0,0020
Cirrhosis +	-0,002***	0,0003	0,003***	0,0003	-0,002***	0,0004
Tumors ++	-0,002***	0,0006	-0,000	0,0007	-0,003***	0,0010
Chronic headache +++	-0,021***	0,0019	-0,014***	0,0018	-0,018***	0,0018
Alzaimer and parkinson	-0,006***	0,0007	-0,001**	0,0006	-0,007***	0,0009
Depression	-0,022***	0,0012	-0,035	0,0016	-0,030***	0,0014
N. Obs	<i>115.019</i>		<i>105.844</i>		<i>99.479</i>	
<p>+ The change in concentration index is not significant</p> <p>++ The change in concentration index is significant at p = 0.10</p> <p>+++ The change in concentration index is significant at p = 0.05</p>						