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Health Inequalities in Italy: Evaluating the Impact of Decentralisation Reform on Regional Disparities

A Comparative Analysis of Pre- and Post-Decentralisation Reform: Exploring Factors Contributing to Persistent Health Inequalities

by

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Abstract: This thesis examines the impact of Italy's decentralisation reform in the 1990s on health inequalities across different regions, considering the notable disparities that have historically existed between the wealthier North and the poorer South. However, in addition to this regional distinction, the analysis encompasses a broader perspective on regional disparities in general, including economic, social, and health inequalities. Through a combination of quantitative and qualitative measures, the research analyses data from before and after the implementation of the reform to identify any changes in health disparities and explore the contributing factors. While the reform aimed to increase regional autonomy and improve healthcare access, the findings suggest that health inequalities persist, and in some cases, have even worsened. The structural and socio-economic factors underlying these disparities have not been adequately addressed by the reform. As a result, the thesis recommends that policymakers focus on investing in education and employment opportunities, improving living conditions, and strengthening regional coordination and collaboration in healthcare planning and delivery. These measures are essential to address the root causes of health inequalities and enhance the effectiveness of decentralisation reforms in promoting equitable access to healthcare services across all regions.

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1 Introduction

The introductory chapter of this thesis commences with a brief overview of the decentralisation processes, with particular attention to the context of Italy. This background information sets the stage for the subsequent discussions on the research topic. The chapter then presents the specific aim and research question of the thesis, which guide the exploration and analysis of the decentralisation of healthcare administration in Italy. By examining the factors driving decentralisation, the effects on the healthcare system, and the challenges encountered, this thesis seeks to contribute to the ongoing discourse on the regionalisation of public services.

1.1   Decentralisation of Services and a Regional Perspective in Italy

In recent years, the trend towards regionalisation of public services has become increasingly prevalent in many countries worldwide. According to Rondinelli's (1983) definition, regionalisation entails the decentralisation of services and decision-making from central authorities to regional or local entities. This shift aims to improve local accountability and responsiveness to the specific needs of communities, while also enhancing the efficiency and quality of services. While the potential benefits of regionalisation are widely recognised, it also poses significant challenges, including ensuring equitable access to services across regions, coordinating resources and efforts, and balancing local autonomy with national priorities (Council of Europe; 1998). A particularly interesting case study of regionalisation and its potential positive and negative effects is Italy.

Italy is a densely populated European country with approximately 60 million inhabitants, divided into 20 regions, each governed by elected officials; these regions vary significantly in size and population. Historically, the Ministry of Health maintained a

centralised approach to managing and planning healthcare services throughout the country, as explained by Cicchetti and Gasbarrini (2016). However, since 1992, there has been a trend towards decentralisation of healthcare administration, delegating greater responsibility for the healthcare sector to each region. This approach has allowed regions to develop distinct health strategies without the need for national approval, as reported by Garattini et al. (2020). Notably, health is the largest budgetary item for all regions, and it remains a significant political issue during local elections. Garattini et al. (2020) observe that, as a result, the Italian National Health Service has transformed into a collection of uneven regional health services operating within the same country.

1.2   Aim and Research Question

This study will focus on inter-regional inequalities: in particular, how previous socio-economic disparities affected health status inequalities among regions after the decentralisation of the healthcare system management. Here, we will refer to "Northern Italy" talking about the following regions: Valle d'Aosta, Liguria, Lombardia, Piemonte, Trentino-Alto-Adige, Veneto, Friuli-Venezia-Giulia, Emilia-Romagna, Toscana, Umbria, Marche; we will refer to "Southern Italy" talking about: Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, Sardegna. The differentiation is not so clear-cut: in fact, a deeper analysis would consider the division of the country into North-East, North-West, Centre, South and Islands. However, this study will focus on a general and metaphorical division of the country into two, thus grouping the regions into 'North' and 'South' Italy.

The Italian healthcare system has been a subject of debate for many years, with concerns raised regarding the disparities between the North and South regions. As previously mentioned, the Italian government decided to decentralise the healthcare sector's administration: a reason for this decision certainly was trying to address some of the already existing inequalities issues between regions, but there also were some important economic reasons.

This thesis aims to investigate whether pre-existing disparities between regions have affected the quality of healthcare systems and the overall health status of citizens after the reform, trying to answer the following question:

Did the decentralisation of healthcare administration in Italy exacerbate the disparities between the North and South of the country?

Despite the abundance of data on the issue of the North-South divide in Italy, a literature gap exists regarding a comprehensive analysis of the factors driving health inequalities between these two macro-regions and among regions in general. Previous research on this topic has not thoroughly explored the indicators considered in this study. Specifically, the present work will focus on public health expenditure per capita as the key measure for assessing regional health inequalities. Additionally, regional GDP per capita, the number of university students at the regional level, and the proportion of the population aged 65 and above will serve as explanatory indicators. This thesis aims to determine whether these indicators are major determinants of health inequalities among regions. Thus, the study seeks to address this research gap by examining these indicators and gaining a deeper understanding of the factors contributing to health inequalities between the North and South regions of Italy.

To address the research question, an explanatory approach is employed to conduct a quantitative analysis of data primarily sourced from the Italian National Institute of Statistics (ISTAT) alongside credible sources such as the European Observatory on Health Systems and Policies. The primary objective of this thesis is to enrich the existing knowledge on the determinants of health inequalities between regions and to ascertain the impact of the decentralisation system implemented in 1992 on regional disparities. By increasing understanding of the factors that influence healthcare, policymakers can better focus their efforts towards ensuring equitable access and outcomes for all individuals across Italy. This study seeks to contribute to this broader goal by generating evidence-based insights that inform more effective healthcare policy and practice.

1.3   Outline of the Thesis

The subsequent sections of the thesis are organised as follows. Chapter 2 presents an extensive review of the relevant literature, highlighting key findings that inform the current study. Chapter 3 provides a comprehensive overview of the Italian healthcare system, tracing its historical evolution up to the decentralisation reform and present-day structure. Subsequently, Chapter 4 delves into the financing model of the decentralised healthcare

system and explores the imminent demographic challenges it is poised to confront. Chapter 5 focuses entirely on the data employed in the study, offering detailed descriptions of each variable and providing an overview of the data sources. Furthermore, this chapter elucidates the rationale behind the selection of specific variables. The methodology is outlined in Chapter 6, where the empirical strategy and the model are presented. Chapter 7 revolves around the empirical analysis itself, showcasing the results derived from OLS regression models and drawing practical implications from the findings. Moving forward, the discussion chapter (Chapter 8) initiates a comprehensive exploration of the obtained results, with particular emphasis placed on two variables: GDP per capita and the proportion of the elderly population. Lastly, the concluding section offers final remarks and synthesizes the key contributions of the thesis.

2 Previous Research

The following section outlines the perspectives within contemporary literature on regional disparities concerning health outcomes and access that are important for the scope of this thesis.

Extensive research has been conducted on the influence of regional disparities on health outcomes and access to healthcare services, both within Italy and more broadly in other countries. Geographic variations in health outcomes and healthcare utilisation have been well documented in the literature, according to a study by Macinko et al (2003). A report by UNECE (2017) focuses specifically on older adults residing in rural and remote areas: on top of the unique ageing challenges they already face, there is also access to healthcare, social services, transportation, and social isolation. Socioeconomic and demographic factors such as income, education and race/ethnicity have been found to contribute to regional disparities in health outcomes (Kaplan et al., 1996). Moreover, a study by Braveman and Gruskin (2003) revealed that regional disparities in health outcomes and access to healthcare services can also be attributed to structural factors such as the distribution and availability of healthcare facilities and resources. Overall, previous research highlights the critical need to address regional disparities to ensure equitable access to healthcare services and improve health outcomes for all individuals.

As the research delves deeper into the existing literature with a focus on Italy, an in-depth analysis of select works that hold significant relevance to the study will be presented.

Franzini and Giannoni (2010) in their article "Determinants of health disparities among Italian Regions" aimed to investigate the factors that contribute to health disparities between different regions in Italy. The study was motivated by the fact that despite Italy's universal healthcare system, there are significant disparities in health outcomes across different regions. Conducting a review of the literature on health disparities in Italy, the authors identified several key determinants. First, they found that regions with higher levels of income and education tend to have better health outcomes. Second, regions with better

healthcare infrastructure and more healthcare providers tend to have better health outcomes. Third, regions with higher levels of air pollution and poorer water quality may experience worse health outcomes. Last, the authors show that lifestyle factors such as diet, exercise, and smoking also play a role in determining health outcomes. Overall, the authors note that residents living in regions with more poverty, more unemployment, and more income inequality are more likely to report poor health. They emphasize the need for policies and interventions aimed at improving living conditions and access to quality health care to reduce health inequalities across regions. Franzini and Giannoni (2010) represent a very valuable contribution to the framework of research on health inequalities. However, in their analysis, the authors neglected to consider the role of regional population age structure, a variable that will instead be considered in the present study.

Toth's article "How health care Regionalisation in Italy is Widening the North-South Gap" (2014) argues that the regionalization of the Italian healthcare system has widened the gap between the North and South of Italy in terms of healthcare access and outcomes. To support this argument, Toth presents several pieces of evidence. Regional variation in health care spending: Toth notes that there are significant differences in health care spending across Italy's regions, with some regions in the North spending more than double what some regions in the South spend. This suggests that some regions have more resources to devote to health care, which may lead to better outcomes. First, Toth argues that there are significant differences in healthcare infrastructure across the North and South of Italy. For example, there are more hospital beds per capita in the North than in the South, and the North has more advanced medical equipment. These differences in infrastructure may contribute to differences in healthcare outcomes. Additionally, Toth cites several studies that have found that healthcare outcomes are worse in the South than in the North of Italy. For example, the South has higher rates of infant mortality, lower life expectancy, and higher rates of chronic diseases. Last, Toth notes that many healthcare professionals are leaving the South of Italy to work in the North or abroad, which exacerbates the healthcare workforce shortage in the South. Taken together, these pieces of evidence suggest that the regionalisation of the Italian healthcare system has contributed to widening healthcare inequalities between the North and South of Italy. Toth's work represents a valuable source of data supporting the fact that the decentralising reform of the Italian healthcare system has exacerbated the inequalities between Northern and Southern Italy. However, when dealing with regional funds, Toth does not consider the higher average age of the population. This is an inescapable fact to consider

when studying regional health expenditure and including it among the primary differences between North and South is one of the aims of this thesis.

Neri's (2019) scholarly article, titled "Economic Crises, Decentralisation, and Health Inequalities: The Case of Italy", investigates the influence of economic downturns and decentralisation policies on health disparities in Italy. The author conducts a comprehensive literature review of prior research on the subject to explore this issue. The article commences by contextualising the historical and political background of healthcare in Italy, including the country's regional autonomy tradition and the National Health Service's role. The author then examines existing literature on the impact of economic crises on health inequalities, emphasizing the importance of social determinants of health and the potential for economic crises to exacerbate pre-existing health disparities. Subsequently, the article assesses the literature on decentralisation policies in Italy and their impact on healthcare delivery and health outcomes. The author observes that decentralisation can lead to increased local control and more effective healthcare service delivery. However, it may also contribute to greater disparities in access to care and health outcomes. The article further explores the interconnection of economic crises and decentralisation policies in Italy, highlighting the potential for these two factors to interact and worsen existing health inequalities. Finally, the author concludes by discussing the implications of these findings for policymakers and suggesting areas for future research. Neri's research has a fiscal focus and highlights how Italy's economic downturns in recent decades have exacerbated health disparities between Northern and Southern regions. While this differs from the current study's approach, Neri's work provides valuable insights into the linkages between regional economic development, resilience to economic downturns, and the provision of equitable and effective healthcare services to the population. Given the significance of the 2008 financial crisis as Italy's most severe recession in recent history, Neri's research is relevant to this thesis in demonstrating the impact of the financial crisis on economic inequalities between the North and South, which need to be considered when analysing the worsening of health inequalities. However, Neri's study does not address socio-cultural variables specific to regions that can impact economic development opportunities. To fill this gap, the present thesis will consider the number of university students in every region as an indicator of cultural and regional development.

The European Observatory on Health Systems and Policies, together with the OECD (2019) provides a comprehensive analysis of the Italian healthcare system and the state of health of the Italian population. The report highlights that the Italian healthcare system has a universal coverage model, providing free or low-cost healthcare services to all residents; it is decentralised, with every region responsible for managing healthcare services. The study also notes the significant improvements in the health of the population made possible by the Italian healthcare system, such as the second highest life expectancy in the European Union, a low infant mortality rate, and a low prevalence of risk factors. However, the report also identifies several challenges facing the Italian healthcare system: one of the most significant is the regional disparities in healthcare services, with some regions having better access to healthcare services and higher quality care than others. Another area of concern is the high prevalence of obesity and the increasing prevalence of mental health disorders: implementation of preventive measures and the development of specialised services to address these challenges are recommended. Overall, the report identifies several strengths and weaknesses of the Italian healthcare sector and provides recommendations for addressing the challenges facing the system, highlighting the need for continued efforts to improve the quality and accessibility of healthcare services in Italy. This study provides an accurate and comprehensive picture of the Italian healthcare system, highlighting regional disparities; however, an in-depth analysis of the underlying reasons for these disparities is lacking, leaving this question unanswered. The purpose of this thesis is specifically to find answers that can fill that gap.

This thesis is expected to make a significant contribution to the research on regional health disparities in Italy, given the considerable differences in health outcomes and healthcare provision across regions. These variations may stem from differences in access, quality, and efficiency of health services. By examining the underlying determinants of these disparities, this study aims to raise awareness among policymakers and stakeholders about potential areas for improvement in the Italian health system. Furthermore, the findings of this research are expected to contribute to the ongoing debate on health equity and social justice in Europe.

3   Country Profile

This chapter will outline the geographical context of study of this thesis: Italy. Specifically, an overview will initially be given of the North-South imbalance characterised by strong economic, social and health inequalities, which has been dividing the country into two macro areas for years. Subsequently, the history and the evolution of the Italian health system will be presented, in order to create the horizon of knowledge necessary to frame the dynamics of inequalities on which this work focuses. This will be followed by an excursus on the decentralisation processes that found fertile ground in various parts of Europe during the 1990s. This European parenthesis will be necessary to frame the regionalisation reform of the Italian health system in a trend of political choices popular throughout the continent.

3.1   Pre-existing inequalities between regions

The regional disparities within the Italian healthcare system have given rise to the popular adage "Health is a right in the North and a hope in the South": even before the decentralisation, there have historically been significant inequalities in healthcare access and outcomes between Northern and Southern Italy. Despite some recent improvements, the problem of unequal healthcare standards persists, highlighting a "tale of two Italies". Several scholars have attempted to explain this phenomenon and have focused on the relationship between health and socioeconomic factors at the regional level. One major factor contributing to these disparities has been the difference in economic development between the two macro-regions: Northern Italy has historically been – on average – wealthier and more industrialised, with a higher GDP per capita than Southern Italy (Fina et al. 2021). The distribution of healthcare professionals also played an important role: Southern Italy has fewer healthcare professionals than the North. This shortage of healthcare workers led to longer waiting times for appointments, lower quality of care, and reduced access to specialised medical services (De Belvis et al. 2022). In addition to these structural inequalities, there have always been cultural and social differences between Northern and Southern Italy that can impact

healthcare outcomes. For example, Southern Italians are more likely to have a Mediterranean diet, which is associated with a lower risk of chronic diseases such as heart disease and diabetes. However, cultural factors such as smoking and alcohol consumption are also more prevalent in the South, which can increase the risk of certain health problems (Garzillo et al. 2022). Overall, the inequalities in healthcare between Northern and Southern Italy are complex and multi-faceted, with economic, social, and cultural factors all playing a role.

In addition to the ones that will be used for the specific purpose of this thesis, the foregoing pre-existing inequalities may be observed by examining various indicators. For instance, infant mortality rates – the number of deaths occurring in the first year of life for every 1000 live births – have historically been a significant contributor to health inequality (Simeoni et al.; 2019). Notably, Italy has experienced a significant decline in infant mortality over the past decade, surpassing rates recorded in the most developed Western countries, but this decline has not been homogeneously distributed (Simeoni et al.; 2019).

Health disparities among regions could be attributed to a range of factors, including differences in healthcare resources, infrastructure, and healthcare access barriers. Historically, different healthcare access barriers have been expressed at the geographical level, to the detriment of the central and southern regions, and at the sociodemographic level, to the detriment of the most disadvantaged social strata, such as the less educated and poor (Matranga & Maniscalco; 2022).

It is possible to assert that inequalities in healthcare access and outcomes between the North and the South of Italy have long been well-documented, even predating healthcare decentralisation. Although the reform aimed to alleviate some of these gaps, data show that socioeconomic inequalities in health have been increasing faster in Italy compared to other European countries (Franzini & Giannoni; 2010).

3.2   History of the Health Care Sector in Italy

Since the unification of Italy in 1861, the institutional model of the Italian healthcare system has undergone significant changes at least three times. During the liberal era (1861-1921) and the fascist decades (1922-1943), the system was largely residual, with limited corporate health funds and some compulsory insurance schemes for specific illnesses (Neri;

2019). However, following the end of fascism, the system transitioned to a social health insurance model, which was developed in the first 30 years of the Republic (1945-1977). Finally, in 1978, the Italian government established a universalist National Health Service (NHS), with Law No. 833, to replace the previous system based on insurance funds (Neri; 2019) and with the declared goal of improving equity by providing uniform and comprehensive healthcare services across the country (Di Novi et al.; 2019). Specifically, Law No. 833/1978 annulled the mutualistic healthcare service, based on individual work taxation coverage, and introduced the universalistic NHS, based on general taxation. The inner intent of this law was to provide uniform and equal access to NHS all over Italy, following Article 32 of the Italian constitution (Cicchetti and Gasbarrini; 2016). The new NHS was based on general taxation and aimed to create an efficient and uniform health system that covered the entire population, irrespective of income or contributions, age, gender, employment, or pre-existing health conditions. Cicchetti and Gasbarrini (2016) observe that the NHS currently provides healthcare services to all residents and their families and emergency care to visitors, regardless of their nationality: universal coverage for all citizens is nowadays one of the core principles of the Italian National Healthcare Service.

Healthcare expenditure in Italy has shown a steady increase over the years. Reforms introduced by the central government in the early 1990s aimed at curbing this growth by shifting the responsibility of managing and funding healthcare services to regional jurisdictions (Di Novi et al.; 2019). As noted by Ferrario and Zanardi (2011), the declared aim was to improve spending efficiency by increasing regional governments' accountability via fiscal autonomy.

As mentioned, a process of decentralisation of healthcare services management began and was implemented during the 1990s. The regionalisation of the NHS, enforced by Law No. 229/1999, became actual "federalism" with the reform of title V of the Constitution (D. Lgs. 56/2000) and its modification in 2009: regions were now allocated a proportion of the health care budget annually, and this is still the case today, although the proportion varies based on complex agreements among regional health authorities, the Minister of Health, and the Minister of Economics and Finance (Cicchetti & Gasbarrini; 2016). The NHS is now organised at central, regional, and local levels. At the national level, the Minister of Health, supported by several specialised agencies, sets the fundamental principles and goals of the health system, determines the core benefits package of health services guaranteed across the country (*Livelli Essenziali di Assistenza*, LEA), and allocates national funds to the Regions.

Regions are then responsible for organising and delivering health care services, while geographically based local health authorities (*Aziende Sanitarie Locali*, ASL) deliver public health, community health services, and primary care directly through public hospitals or accredited public providers (Cicchetti & Gasbarrini; 2016). Poscia and colleagues (2014) explain that the financing and distribution of funds among the local health authorities, as well as the adaptation of national goals to local socio-epidemiological contexts, form the foundation of regional planning.

It has been argued by Mapelli (2012) that the autonomy enjoyed today by Italian regions is such that it has led to the existence no longer of a single national health service, but rather of 20 different regional systems. This pattern entrenches tensions between the more and the less-developed regions and worries the central government, which is committed to guaranteeing uniform levels of care over the entire national territory (Toth; 2014).

3.3   Decentralisation Tendencies all over Europe

Before delving into the specific context of Italy, it is necessary to provide a general framework. During the 1990s, several European countries undertook healthcare system decentralisation reforms. The general aim of these reforms was to increase regional and local control over healthcare delivery and financing, with the hope of improving efficiency, reducing costs, and increasing responsiveness to local needs. According to a report by the European Observatory on Health Systems and Policies (Saltman et al.; 2007), these reforms involved "the transfer of power and responsibilities from central to regional or local authorities, with the latter assuming greater autonomy over healthcare decision-making". The authors note that these reforms were intended to make healthcare systems more responsive to local needs and improve the quality and efficiency of healthcare delivery (Saltman et al.; 2007). Overall, as noted by Terlizzi (2019), decentralisation has been a key feature of contemporary governmental institutions.

The concept of decentralisation is grounded in the fundamental principle that smaller organisations – when structured and managed effectively – possess greater flexibility and accountability than larger organisations. This idea is powerful and has prompted national and regional policymakers throughout Europe to adopt decentralisation strategies. This restructuring process has gained momentum since the Second World War, resulting in an

extensive and diverse range of decentralised operational and managerial arrangements in various sectors, particularly the health sector, as reported by the European Observatory on Health Systems and Policies (Saltman et al.; 2007).

What were the underlying factors and motivations driving the implementation of the decentralisation reform?

Terlizzi's (2019) synthesis presents a comprehensive examination of the arguments supporting and opposing decentralisation. Advocates assert that decentralisation fosters technical efficiency and allocative efficiency in the provision of health services, as well as encourages innovation through competition and policy development at the subnational level. The reduction of bureaucracy and the closer proximity of decision-makers to citizens lead to cost containment and better alignment with local needs and preferences (Ostrom; 2005). Conversely, those opposed to decentralisation cite the risk of a loss of technical efficiency due to a failure to leverage economies of scale, the potential for geographical inequities resulting from differential subnational government capacity and choices, and potential coordination problems that may arise with subnational governments pursuing policies that diverge from those required by the central government. Ultimately, decentralisation may undermine financial discipline and the sustainability of public finances (Terlizzi; 2019).

Within the Italian context, concerns regarding the potential exacerbation of regional inequalities between the Northern and Southern regions have been raised in the decentralisation debate. Italy's historical socioeconomic disparities have led to significant disparities in economic development, educational attainment, and health outcomes between different regions, resulting in the so-called North-South divide (Fina et al.; 2021). Overall, already before the decentralisation of healthcare services, notable disparities in healthcare access and outcomes between Northern and Southern Italy existed and persisted over time. Therefore, it is possible to affirm that the North-South divide has been a long-standing issue, marked by macro-regional differences in economy, trade, infrastructure, health care, housing and poverty which created a great divide within the nation (Simeoni et al.; 2019). For this reason, the decentralisation reform in Italy faced numerous sceptical objections, as many feared that it could exacerbate existing inequalities and disparities between the two macro areas.

Despite the concerns surrounding the decentralisation reform, Italy ultimately decided to move forward with this major policy change. One of the main reasons for this decision was the belief that greater regional autonomy could help to address some of the

longstanding economic, social and health inequalities between Italian regions. By allowing regional governments to have greater control over their own affairs, it was hoped that they would be better equipped to identify and address the unique challenges facing their communities (Toth; 2014).

4 Regional Health Care System: Financing and Demographic Challenges

This chapter will deal with the economic management of regional health systems after the decentralising reform. As will be shown below, clear disparities persist between regions regarding the proportion of contributions received from the central government and the funding received from the collection of taxes on the regional territory used to finance their regional health sector. Subsequently, the demographic challenges Italy is already facing, and which will become more and more imposing in the near future, will be presented and discussed. Specifically, the role of the ageing population on public health expenditure will be highlighted.

4.1 Financing of the Regional Health Care System

Within the broader framework of economic discrepancies across different regions in Italy, there is a pressing need to ensure equitable access to healthcare and provide equal per capita healthcare financing. This necessitates a substantial redistribution of financial resources. Regions with stronger economic conditions primarily finance their healthcare requirements through their own taxation policies, while comparatively weaker regions depend more heavily on central-government transfers and equalisation flows (Scope Ratings; 2021).

Italy has an asymmetric decentralisation with fifteen ordinary-status regions (RSO) and the five special-status regions (RSS) enjoying even more legislative and financial autonomy (Aosta Valley, Friuli-Venezia Giulia, Sardinia, Sicily and Trentino-Alto Adige) (UCLG & OECD; 2016).

In the context of RSO in Italy, the primary source of healthcare funding, known as "*fondo indistinto*", is derived from a combination of sources. These include revenues generated by LHAs (Local Health Authorities) from services that require payment from citizens, regional taxes that are specifically earmarked for healthcare purposes such as the

IRAP and IRPEF supplement, and funding from the central government budget. The central government contributes to the fund through the shared VAT for healthcare and the national healthcare fund (Scope Ratings; 2021).

The allocation of VAT revenue to each region in Italy is contingent upon the degree to which their funding requirements can be met through their own taxation policies. Regions with weaker economies rely more heavily on the VAT transfer compared to their stronger counterparts who can finance a greater proportion of their healthcare expenditures through their own taxes. These discrepancies are illustrated in Table 1, which displays the financing sources for healthcare across various regions. For instance, the affluent region of Lombardy finances approximately 40% of its standard healthcare needs through its own taxes and the remaining 60% through the VAT transfer. Conversely, Calabria, a relatively economically disadvantaged region, finances only about 6% of its healthcare requirements through regional taxes, relying on the shared VAT for over 90% of its healthcare financing (Scope Ratings; 2021).

Table 1. Healthcare financing resources (% of the total, by region, 2019)

	LHAs revenue	RSS additional	IRAP	IRPEF supplement	VAT healthcare	Central government funds
Lombardia	2	0	27	11	60	0
Lazio	1	0	27	9	63	0
Emilia Romagna	2	0	24	10	64	0
Veneto	2	0	23	9	66	0
Toscana	2	0	20	9	69	0
Piemonte	2	0	19	9	70	0
Liguria	2	0	18	10	70	0
Marche	2	0	17	8	73	0
Umbria	2	0	14	8	76	0
Abruzzo	1	0	13	8	78	0
Puglia	1	0	9	7	83	0
Campania	1	0	9	6	84	0
Molise	2	0	2	6	90	0
Basilicata	1	0	2	7	90	0
Calabria	0,5	0	0	6,5	93	0
Sicilia	0,5	49,5	14	6	0	30
Trentino-Alto Adige	1	56	32,5	10,5	0	0
Valle d'Aosta	1	59	30	10	0	0

Friuli-Venezia Giulia	2	65	23	10	0	0
Sardegna	0,5	77,5	15	7	0	0

Sources: Ministry for Healthcare "Riparti 2019", refers to the "fondo indistinto", Scope Ratings GmbH

4.2   Demographic Challenges

Looking forward, regional finances for healthcare spending in Italy are expected to face additional challenges due to demographic changes, especially the dynamics of population ageing. According to the 2018 Ageing Report by the European Commission, Italy's ageing trends are expected to deteriorate more rapidly than the euro area average in the coming decades. Moreover, by 2050, Italy's old-age dependency ratio is expected to reach 62.5%, which means that almost two-thirds of the population will be aged 65 or older compared to those aged 15-64, significantly impacting regional healthcare spending (European Commission; 2018). This demographic shift has significant implications for healthcare expenditure, given the higher levels of medical attention and treatment typically required by older individuals. As a result, there could be significant budgetary pressures for regions, limited flexibility to respond, and a greater reliance on central government funding. Indeed, a study conducted by the Organisation for Economic Co-operation and Development (OECD) has identified population ageing as the primary driver of healthcare spending in Italy, with healthcare spending projected to increase by 3.6% annually between 2015 and 2030 (OECD; 2019). Without significant restructuring of the overall framework, the proportion of healthcare costs that regions can cover with their own taxes is likely to decrease as healthcare costs continue to rise (Scope Ratings; 2021). Given these challenges, policymakers must consider innovative solutions to manage rising healthcare costs while ensuring access and quality of care for all. These may include targeted investments in preventative care, promoting healthy behaviours among older adults, and exploring novel models of care delivery that leverage technology and community-based resources. Therefore, it is essential to consider the population ageing dynamics taking place across Italy, which also show marked differences between Northern and Southern regions.

5   Data

This chapter will examine the data utilised to construct the foundational model of the thesis. It will present each variable, discussing its theoretical and practical significance, as well as the rationale for its inclusion. Additionally, the sources from which the corresponding data were collected will be outlined, along with an explanation of the data collection methods and their reliability.

5.1   Public Health Expenditure Per Capita

Public healthcare expenditure per capita is the variable that has been chosen as the dependent variable in the model to explain health inequalities between regions in Italy. It is considered a valid indicator of health system performance, although it may not capture all aspects of it, and is commonly used by international organisations and researchers. Indeed, the WHO (Makinen et al.; 2000) defined health expenditure as a key determinant of healthcare access and utilisation, which has a significant impact on health outcomes. As highlighted by the National Academies of Sciences, Engineering, and Medicine (2017), unequal access to healthcare services, particularly among individuals living in lower-income regions, contributes to health disparities and reinforces social inequalities. Specifically, this variable can provide insight into the number of public resources allocated to healthcare services in each region and how these resources contribute to unequal access to healthcare services (Baeten et al.; 2018). Therefore, public health expenditure per capita will be used in this study as an indicator of health inequalities.

The findings from this study can provide policymakers with valuable information regarding the distribution of public resources for healthcare services and how they can be optimised to improve access and promote more equitable health outcomes across regions.

The datasets for public healthcare expenditure per capita in Italy for the years 1990 and 2019 rely on data obtained from three different sources, the European Health Observatory

(EHO) for the year 2019, the Italian National Institute of Statistics (ISTAT) and the National Health Institute for Research on Health Care (SANITEIA) for 1990. The EHO is a branch of the World Health Organisation that provides reliable and valid data, collected from official government records and subject to rigorous quality checks and validation procedures. The data from the EHO covers the WHO European Region, including Italy, which enhances the external validity of the study. On the other hand, the data collected by ISTAT and SANITEIA for 1990 is also reliable and representative of the Italian population. ISTAT is the Italian National Institute of Statistics responsible for collecting, analysing, and disseminating statistical data related to different aspects of Italian society, such as demography, economy, and social conditions. Standardised procedures and rigorous sampling techniques are used, ensuring accuracy and representativeness. However, changes in data collection methods and healthcare expenditure definitions over time may affect the comparability of data across different years. Moreover, variations in healthcare expenditure patterns across different regions and subgroups of the population may not be fully captured by the data. Despite the possibility of measurement errors or bias impacting accuracy, the data collected by ISTAT and SANITEIA is generally considered valid for the purposes of this study.

Three independent variables are then used in the model to explain the variation in public health expenditure per capita: regional GDP per capita, the proportion of the older population (aged 65 and over) in each region, and the number of students enrolled in university programs per capita in each region.

5.2   Regional GDP Per Capita

The Gross Domestic Product (GDP) per capita is a crucial independent variable that has been included in the model to explain health inequalities between regions in Italy. GDP per capita is a widely used measure of economic development, and it has already been shown to be strongly correlated with health outcomes (Miladinov; 2020). Higher levels of GDP per capita are often linked to better health outcomes, including longer life expectancy and lower rates of morbidity and mortality. Additionally, GDP per capita can reflect the level of investment in healthcare infrastructure and the quality of healthcare services available in each region. By including GDP per capita in the model, this study seeks to explore the correlation between economic development and regional health disparities. Specifically, this variable can

provide valuable information about the level of economic resources available in each region and their potential contribution to health inequalities. Based on the author's initial hypothesis and preconceived notions, GDP per capita is considered the primary suspect in playing a significant role in shaping health disparities. Given the well-documented economic disparities between the North and South of Italy, and among regions in general, the author's inclination suggests that this variable holds the greatest potential for explaining the observed variations in healthcare expenditure and health outcomes.

The findings of this study can offer policymakers insights into the relationship between economic development and improved health outcomes, informing the design of targeted economic policies aimed at mitigating health disparities.

Statista was used to collect data on Italy's GDP per capita by region in Italy in 2019, while data from 1990 were obtained directly from ISTAT. The latter is a reputable source of economic data in Italy and its GDP per capita figures for the country's regions are widely used and acknowledged by academia and the business community. Statista is a data aggregator, not the primary data source, therefore the reliability of the data depends on the original source's reliability. GDP per capita alone does not provide a complete picture of economic well-being or inequality within a region: nonetheless, it is a common economic performance indicator used by policymakers, economists, and investors.

5.3   Proportion of the Population Aged 65 and Over at the Regional Level

The final independent variable incorporated into the model to explore health inequalities among regions in Italy is the proportion of individuals aged 65 and above. This variable holds significance due to the prevailing demographic trend of population ageing, which is notable not only in Italy but also in several other countries. Italy serves as a representative example of this phenomenon. Projections indicate a continuous increase in the proportion of older adults (European Commission; 2018) in the coming years, thus underscoring the profound implications this trend holds for healthcare systems and healthcare policies. The ageing process often brings about various health challenges, including chronic diseases, mental health problems, and disabilities. Moreover, the prevalence of these health conditions is often higher among older adults, which can lead to higher healthcare utilisation and costs. Therefore, understanding the impact of the ageing population on health outcomes

and healthcare utilisation is crucial for developing effective healthcare policies. By including the proportion of people aged 65 and over in the model, this study seeks to explore the relationship between the ageing population and health inequalities between regions. Specifically, this variable can provide valuable information about the prevalence of health conditions associated with ageing and how they may contribute to health disparities. The findings from this study can help policymakers to understand the role of the ageing population in promoting better health outcomes and how healthcare policies can be designed to address the needs of this population. By identifying the factors that contribute to health inequalities and promoting interventions that are targeted towards older adults, policymakers can develop healthcare policies that can improve health outcomes and reduce health disparities between regions.

The study also used ISTAT data to obtain information on the percentage of the population aged 65 and over in every region in Italy for 2019 and 1990, which is collected annually using official census methods and statistical sampling techniques. The data on the percentage of the population aged 65 and over in every region of Italy is considered reliable as it is representative of the entire Italian population and collected using well-established and recognised methodologies. Overall, the data sources used in this study are considered valid and reliable indicators for analysing the economic and demographic changes in Italy's regions.

5.4   Students Enrolled in University Programs Per Capita

The variable "number of students enrolled in university programs per capita" has been chosen as an independent variable to be used in the model because it provides insights into the level of educational attainment in each region, which has been shown to be strongly associated with health outcomes by previous research. In particular, Raghupathi and Raghupathi (2020) show that higher levels of education are on average linked to better health outcomes, including a lower risk of chronic diseases and greater overall health status. Education is also recognised as a crucial factor that can influence health behaviours and the adoption of healthy lifestyle choices. By including the number of university students per capita in the model, this study seeks to explore the relationship between educational attainment and health inequalities between regions. Specifically, this variable can be interpreted as a proxy reflecting the level of investments in education in each region and how it may contribute to health inequalities.

The findings from this study can help policymakers to understand the role of education in promoting better health outcomes and to which degree investing in education can be an effective strategy to reduce health disparities between regions.

The dataset on the number of students enrolled in university programs in Italy by regions in 1990 and 2019 is based on data from the ISTAT – University Students Dataset, a reliable source of information collected by the Italian National Institute of Statistics. The dataset covers all regions in Italy and is therefore a comprehensive and representative source of information for the study. However, it is acknowledged that the dataset may not capture all aspects of educational opportunities. Despite this, the dataset is widely used and considered a valid indicator of regional development. To calculate the number of university students per capita, the previous data was divided by the total population figures for the reference regions, obtained from ISTAT, a reputable institution that adheres to strict standards in data collection and processing. Nonetheless, the source does not provide information on demographic characteristics or socioeconomic status, which could affect its representativeness. Consequently, the potential limitations of the data should be considered when making inferences about the population. Nonetheless, the source is considered reliable and valid for obtaining population data for the reference regions in Italy.

The selection of variables in this study was based on the author's discretion to represent specific socio-economic dimensions.

The selection of public health expenditure per capita as the dependent variable serves as an indicator reflecting the willingness and/or ability of individual regions to allocate economic resources towards healthcare services within their respective territories. This choice is driven by the understanding that higher resource allocation tends to lead to improved health outcomes and enhanced access to healthcare (Garcia-Escribano et al., 2022). Consequently, this variable was chosen as the metric to assess and evaluate health inequalities among regions, to capture the variations in healthcare provision and identify disparities that exist across different regions.

GDP per capita was selected as a representative variable to reflect the wealth status of residents in the reference region. Additionally, the proportion of the elderly population residing within each region was included as an important indicator in the field of health economics, given their typically higher demand for healthcare services. Lastly, the number of students enrolled in university programs per capita was chosen as a variable indicative of the

cultural activity and educational level within the region, despite recognising that multiple variables could have been considered to examine the role of education in a specific region. These variables were carefully chosen to provide insight into the socio-economic factors influencing public health expenditure and highlight relevant dimensions that contribute to regional healthcare dynamics.

Table 2 and Table 3 provide descriptive statistics of all the variables used in this study.

Table 2. Descriptive statistics of dependent and independent variables for the year 1990

	Obs.	Mean	S.D.	Min.	Max.
Public Health Expenditure P.C.	20	133.35	24.41	106	208
GDP Per Capita	20	3856.15	607.64	2938	5464
Proportion of P. Aged 65+	20	0.1482	0.02	0.124	0.183
University Students Per Capita	20	0.0312	0.13	0.016	0.048

Note: Author's own elaborations based on data from ISTAT.

Table 3. Descriptive statistics of dependent and independent variables for the year 2019

	Obs.	Mean	S.D.	Min.	Max.
Public Health Expenditure P.C.	20	2056.9	1577.37	1845	2476
GDP Per Capita	20	2758.95	7420.71	17949	40652
Proportion of P. Aged 65+	20	0.2315	0.016	0.204	0.260
University Students Per Capita	20	0.024	0.0075	0.0087	0.042

Note: Author's own elaborations based on data from ISTAT.

6 Methodology

This chapter provides a comprehensive explanation of the applied empirical strategy and model employed to conduct the analysis in this thesis.

6.1 Empirical Strategy

Using the variables presented in the previous chapter, the study applies a quantitative approach to address the research question at hand. Ordinary Least Square (OLS) regressions are utilised to estimate the relationships between the variables. The base model employed in the present analysis can be represented as follows:

$$\ln(Y) = \beta_0 + \beta_1 * \ln(X_1) + \beta_2 * \ln(X_2) + \beta_3 * \ln(X_3) + \varepsilon$$

In the model equation, $\ln(Y)$ denotes the natural logarithm of the dependent variable; $\ln(X_1)$, $\ln(X_2)$, and $\ln(X_3)$ represent the natural logarithms of the first, second and third independent variable, respectively. β_0 represents the intercept term; β_1, β_2, and β_3 are the coefficients of the first, second and third independent variable, respectively. Lastly, ε signifies the error term, capturing the unexplained variability in the dependent variable.

The decision to log variables in the regression model is motivated by several key reasons. Firstly, the log transformations address the issue of heteroskedasticity by reducing the spread of residuals and promoting homoskedasticity. Additionally, logging variables simplify the interpretation of coefficients and effect sizes, as the coefficients in the logged model can be understood as percentage changes or elasticities, enhancing the understanding of the predictors' impact on the outcome variable. Moreover, logging variables can stabilise the variance of skewed or highly dispersed variables, improving the symmetry of their distribution and aligning them more closely with model assumptions. By employing logged variables in the regression model, these benefits contribute to a more robust and meaningful analysis, enhancing the validity and interpretability of the findings.

6.2   The Model

The primary objective of this thesis is to investigate the potential impact of the aforementioned variables on the quality of healthcare systems and the overall health status of citizens in the aftermath of the decentralisation reform. To accomplish this goal, two regression models utilising Ordinary Least Squares (OLS) will be employed. Specifically, regional Gross Domestic Product (GDP) per capita, the per capita number of university students at the regional level, and the proportion of the regional population aged 65 and above will serve as explanatory variables. These variables will be used to elucidate variations in regional public health expenditure per capita, a crucial metric for assessing health disparities across regions.

The analysis will encompass two distinct time points, namely 1990 and 2019, representing periods before and after the implementation of the decentralisation reform in 1992. By comparing health disparities among Italian regions before and following the reform, this thesis endeavours to derive insights into the influence of the decentralisation reform on health inequalities within the country.

Through the application of an OLS regression model, the present study seeks to determine the extent to which regional disparities in public health expenditure can be explained by regional GDP per capita, the number of university students, and the proportion of the population aged 65 and above. By undertaking this analysis, the current research intends to shed light on the influence of the decentralisation reform on regional inequalities and provide valuable insights into the dynamics of health disparities in Italy. This approach has the potential to inform policy discussions and interventions aimed at reducing health inequalities and improving the quality of healthcare across regions.

The two regressions analysis investigate the same relationship, but it is important to note that in the second model a dummy variable was introduced for Molise, a small Southern Italy region that represents an outlier in the database. Molise has the highest public health expenditure per capita in Italy (EUR 2476) and deviates from the traditional North-South divide, where Southern regions typically exhibit lower public health expenditures per capita. To mitigate the potential distortion caused by the outlier observation, a dummy variable was introduced. This was done to minimize its impact on the overall analysis.

The primary objective of this study is to investigate the determinants of health inequalities among various regions in Italy. Health disparities within a country can arise from numerous factors, such as disparities in healthcare accessibility, education, and individual lifestyle choices. Specifically, this research aims to assess the relative significance of three key factors: regional economic disparities, as measured by GDP per capita; healthcare needs, represented by the proportion of the population aged 65 and above; and cultural factors, gauged by higher education enrolment rates. Employing multiple regression analysis, this study will evaluate the distinct contributions of these variables in explaining health inequalities. By including all three variables in the model, this study seeks to control for potential confounding factors and isolate the effects of each specific variable of interest. Ultimately, the findings of this analysis will offer valuable insights into the driving forces behind health disparities in Italy and inform policy interventions aimed at mitigating these inequities.

7 Empirical Analysis

This thesis chapter aims to present the central findings of the regression models obtained from Ordinary Least Square (OLS) analysis. The results for the year 1990 are outlined in Table 4, while Table 5 displays the results for the year 2019. The construction of these tables follows a systematic approach: initially, the key focal variable, GDP per capita, is examined in isolation in the first regression. Subsequently, additional variables are gradually incorporated to showcase their individual impact. Each column in the tables corresponds to a distinct regression, progressively introducing new variables into the analysis.

7.1 Results

Table 4. Results from Ordinary Least Squares Regression for the year 1990. Coefficients and standard errors in parentheses.

	Healthcare Expenditure Per Capita		
	Model 1	Model 2	Model 3
const	-3.84***	-4.80***	-4.83***
	(0.69)	(0.80)	(0.91)
GDP per capita	1.06***	1.12***	1.12***
	(0.08)	(0.08)	(0.09)
65 and above		-0.22*	-0.22*
		(0.11)	(0.12)
university students			-0.00
			(0.05)
Adj R-squared	0.89	0.91	0.90
F-stat	160.73	95.37	59.87
N	20	20	20

Note: Significant codes: *** = p < 0.01, ** = p < 0.05, * = p < 0.1. Rounded to two decimals.

Table 5. Results from Ordinary Least Squares Regression for the year 2019. Coefficients and standard errors in parentheses.

	Healthcare Expenditure Per Capita			
	Model 1	Model 2	Model 3	Model 4
const	6.52***	7.08***	7.00***	6.05***
	(0.60)	(0.66)	(0.69)	(0.46)
GDP per capita	0.11*	0.11*	0.10*	0.16***
	(0.06)	(0.06)	(0.06)	(0.04)
65 and above		0.37	0.35	0.14
		(0.22)	(0.23)	(0.14)
university students			-0.02	-0.03
			(0.05)	(0.03)
dummy Molise				0.25***
				(0.05)
Adj R-squared	0.12	0.20	0.16	0.69
F-stat	3.46	3.36	2.22	11.41
N	20	20	20	20

Note: Significant codes: *** = p < 0.01, ** = p < 0.05, * = p < 0.1. Rounded to two decimals.

The regression model results for the year 1990 yield important insights regarding the factors influencing healthcare expenditure per capita. The negative coefficients associated with the constant term (-3.84, -4.80, -4.83) reveal a negative relationship between the variables and healthcare expenditure when all other independent variables are held constant. In other words, as the values of the independent variables increase, healthcare expenditure per capita tends to decrease. On the other hand, the positive coefficients for GDP per capita (1.06, 1.12, 1.12) suggest that higher GDP per capita is associated with increased healthcare expenditure. This relationship remains statistically significant at the 1% significance level in all regressions, supported by consistently low p-values (< 0.05). Additionally, the presence of individuals aged 65 and above appears to negatively impact healthcare expenditure (-0.22, -0.22), indicating that higher proportions of elderly individuals are associated with lower healthcare expenditure. Although this variable is only marginally statistically significant (at the 10% significance level) in both regressions, its influence is notable. Conversely, the variable "university students" does not show a significant impact on healthcare expenditure in this model, as indicated by the high p-values. The model exhibits a high R-squared value of 0.9182, indicating that the included variables account for a substantial proportion of the variance in public health expenditure per capita. Furthermore, the good Adjusted R-squared value of 0.9029 suggests that the model fits the data well. In summary, these findings suggest

that factors such as GDP per capita and the proportion of elderly individuals play a significant role in explaining healthcare expenditure disparities in the studied year.

The regression model results for the year 2019 provide valuable insights into the factors impacting healthcare expenditure per capita. The positive coefficients associated with the constant term (6.52, 7.08, 7.00, 6.05) indicate a positive relationship between the variables and healthcare expenditure when all other independent variables are held constant. In other words, as the values of the independent variables increase, healthcare expenditure per capita tends to increase as well. Moreover, the positive coefficients for GDP per capita (0.11, 0.11, 0.10, 0.16) suggest a connection between higher GDP per capita and increased healthcare expenditure. However, it is important to note that the coefficients for GDP per capita are relatively small. The significance of this variable increases as other variables are introduced: it is statistically significant at the 10% significance level in the first three regressions and at the 1% level in the last one, as indicated by the p-values. The "65 and above" variable shows mixed results across the models, with coefficients of 0.37, 0.35, and 0.14, indicating that the proportion of individuals aged 65 and above may have varying impacts on healthcare expenditure, depending on the other variables taken into account. On the other hand, the "university students" variable does not exhibit a significant effect on healthcare expenditure in the analysed models. Neither the variable for the elderly population nor the university student variable demonstrates statistical significance, with p-values exceeding 0.1 in every regression. Additionally, the inclusion of the "dummy Molise" variable reveals a positive coefficient of 0.25, implying that the specific region represented by the dummy variable (Molise) is associated with higher healthcare expenditure. This variable is statistically significant at the 1% level, as evidenced by its p-value, < 0.01. The overall R-squared values indicate that these models explain only a small to moderate proportion of the variation in healthcare expenditure, with model 4 exhibiting the highest adjusted R-squared value (0.69). This suggests that other factors beyond the included variables are likely influencing healthcare expenditure in the examined year.

7.2   Practical Implications

The results of the analysis referred to the year 1990 have some important implications regarding the pre- decentralisation reform period.

The lack of direct association between the number of university students enrolled in each region and public health expenditure per capita suggests that, in the specific context of 1990, the number of university students per capita did not have a direct impact on public health expenditure per capita at the regional level. These results first highlight the complex nature of health inequalities: health inequalities between regions are likely influenced by a multitude of factors beyond educational attainment alone. While investing in education is generally seen as beneficial for health outcomes, it may not be the sole driver of health inequalities. Additionally, policymakers and stakeholders should not solely rely on increasing university student enrolment as a strategy to address health inequalities. Instead, they should consider a comprehensive approach that encompasses multiple determinants, such as addressing socioeconomic disparities, improving healthcare infrastructure, and implementing targeted policies to reduce health inequalities effectively. Overall, this finding highlights the need for a nuanced understanding of the factors contributing to health inequalities and the importance of considering multiple variables and contextual factors when formulating policies aimed at reducing health disparities between regions.

On the contrary, the analysis revealed that regional GDP per capita exerted a notable influence on public health expenditure in 1990. This finding holds a crucial implication: wealthier regions possess the ability and inclination to allocate higher financial resources towards the healthcare of their residents. It is crucial to acknowledge that these outcomes pertain to the pre-decentralisation reform period, indicating that uneven healthcare access and disparate health outcomes were already prevalent across Italy even prior to the implementation of the reform. In the context of Italy in 1990, the fact that the national health service was still nationalised and not decentralised is an important consideration when interpreting this finding. The nationalised healthcare system in Italy resulted in the central government playing a pivotal role in determining public health expenditure, while regional governments had limited authority to allocate healthcare funds. Considering this context, the finding that GDP per capita was a significant and positive predictor of public health expenditure per capita in Italian regions in 1990 is noteworthy. This result contradicts expectations that the impact of GDP per capita would be limited due to the centralised nature of the health system. Instead, it indicates that economic growth already played a substantial role in driving increased investment in public health. Regions with higher GDP per capita likely possessed greater available resources to allocate towards healthcare spending. One implication could be that regions with higher GDP per capita may have more political power

and influence in national-level decision-making processes and could therefore lobby for greater investments in public health. However, this may not necessarily result in increased regional-level control over the allocation of funds for healthcare. Overall, while the finding that GDP per capita was a significant predictor of public health expenditure per capita has implications for policymakers in terms of the importance of economic growth, it should be viewed in the context of the nationalised health system of Italy in 1990, which limited regional autonomy in healthcare spending.

The proportion of the population aged 65 and over in every region had a negative (even if weak) impact on public health expenditure per capita. First, the relatively low spending on public health for older adults could reflect a lack of emphasis on preventative health measures for this age group. In 1990, the total population aged 65 and over in Italy accounted for around 14% of the total population, and this percentage has been steadily increasing since then, requiring more attention and resources to address their specific health needs. Another possible implication is that public health policies in 1990 may have been focused on addressing the health needs of younger individuals, such as children and working-age adults, who were perceived to be more productive and economically important. This may have led to a lower priority for public health spending on older adults, who may have been perceived as less productive and less economically active. Finally, the negative correlation between the proportion of the population aged 65 and over and public health expenditure per capita may have also been affected by the structure of the national health service at the time. In 1990, the national health service was still nationalised and not decentralised, meaning that the allocation of resources may not have been based on local needs and priorities. Therefore, it is possible that the negative correlation could reflect a lack of allocation of resources to specific regions or populations with higher proportions of older adults, rather than a deliberate policy decision to underspend on older adults.

The results of the analysis related to the year 2019 reveal a significant positive effect of GDP per capita on expenditure per capita, with a 1% increase in GDP per capita associated with a 0.16% increase in healthcare expenditure per capita. However, the number of students enrolled in university programs per capita, and the proportion of the population aged 65 and over do not significantly influence expenditure per capita. The model accounts for a substantial proportion of the variation in expenditure per capita and is statistically significant at the 0.05 level.

The significant positive effect of GDP per capita on public health expenditure per capita in every region provides a clear indication that wealthier regions have more resources to invest in their healthcare systems, and consequently in their citizens' health, both before and after the decentralisation reform. As previously demonstrated in this thesis, regions with higher GDP per capita are more likely to finance their healthcare system using their own taxes, which may have several implications. For example, richer regions could be able to provide higher wages for public healthcare workers, which could incentivise individuals to pursue careers in healthcare, leading to a more motivated workforce and potentially better healthcare outcomes for patients. Improved access to medical facilities and better quality of care could result in better health outcomes for residents in these regions.

The study's results suggest that the number of students enrolled in university programs per capita in each Italian region does not have a statistically significant influence on public health expenditure per capita. This finding suggests that the cultural development of a region, as represented by higher education enrolment rates, may not be closely linked to the health status of individuals residing in the region or the effective functioning of local healthcare services. Therefore, other factors beyond higher education enrolment rates may play a more critical role in determining public health expenditure. Consequently, the study highlights the need for policymakers and healthcare providers to prioritize addressing these economic and demographic factors to reduce health inequalities, rather than solely emphasizing the promotion of higher education enrolment rates. A clear comprehension of the health advantages associated with education plays a vital role in diminishing health disparities and enhancing the effective allocation of healthcare expenditure resources. Despite the growing attention, research in the education-health area does not offer definitive answers to some critical questions. Part of the reason is the fact that the two phenomena are interlinked through life spans within and across generations of populations (Zajacova & Lawrence; 2018), thereby involving a larger social context within which the association is embedded. To some extent, research has also not considered the variances in the education-health relationship through the course of life across birth cohorts (Lynch; 2003), or if there is causality in the same. There is therefore a growing need for new directions in education-health research (Ragupathi and Raghupathi; 2020).

The regression analysis found that the proportion of people aged 65 and above in each region does not have a statistically significant effect on public health expenditure per capita, implying that policymakers should consider other factors when allocating resources and planning healthcare services for each region. Although this age group generally requires

more healthcare services and resources than other age groups, this greater need is not adequately reflected in public health expenditure, and this can imply several possibilities. First, the public health expenditure may not be aligned with the changing demographics and healthcare needs of the ageing population. Budgetary constraints or competing priorities may hinder the allocation of sufficient resources to address the specific healthcare requirements of older individuals. Additionally, this finding may highlight inefficiencies in the healthcare system: the healthcare system may not be optimised to effectively meet the demands of the ageing population. Inadequate planning, organisational inefficiencies, or suboptimal resource utilisation could contribute to the mismatch between healthcare needs and public health expenditure. Finally, public health expenditure might not be the sole source of healthcare funding for the elderly. Other financing mechanisms, such as private insurance or out-of-pocket payments, could contribute significantly to meeting the healthcare needs of older individuals, which may not be reflected in public health expenditure alone. Addressing these issues requires a comprehensive evaluation of the healthcare system, including resource allocation strategies, healthcare delivery models, and policies aimed at reducing disparities in access and quality of care for the elderly.

8 Discussion

The current study employs a consistent model, except for a dummy variable exclusive to the second model, to analyse two distinct time points, namely 1990 and 2019, in order to compare the Italian healthcare system before and after the decentralisation reform implemented in 1992. This approach allows for a comprehensive assessment of the changes and impacts resulting from the reform of the national health system.

The first model is a better fit, accounting for more than 90% of the variance in the dependent variable, public health expenditure per capita, while the second model explains 75% of the variance. The results indicate that GDP per capita is a significant predictor of public health expenditure per capita in both models, whereas the proportion of the population aged 65 and above and the number of university students per capita did not show a statistically significant impact. The findings highlight the need for additional indicators to be included in the model to better explain the healthcare inequalities present throughout Italy, particularly in the South.

Given the considerable significance of GDP per capita and the ongoing academic and political debate surrounding the impact of population ageing on healthcare expenditure, it is essential to give particular attention to these variables. This chapter will focus on analysing the evolution of regional disparities in GDP per capita and healthcare expenditure relating to the regression results.

8.1 Evolution of Regional Differences in GDP Per Capita

Special emphasis should be placed on the changing patterns of regional disparities in GDP per capita throughout the examined time period.

The analysis of regional disparities in terms of GDP per capita within Italy reveals a growing income inequality throughout the country. In 1990, the disparity between the region with the highest GDP per capita (Valle d'Aosta) and the region with the lowest (Molise) amounted to EUR 2526. Over the course of ten years, the gap between the wealthiest and

poorest regions (Lombardy and Molise) increased to EUR 18435. By 2010, this difference had expanded to EUR 21011 between Lombardy and Molise, and in 2019, the disparity between Valle d'Aosta and Calabria reached EUR 22703. These figures demonstrate a consistent increase in the disparities of GDP per capita among Italian regions over the three-decade period from 1990 to 2019.

The evolution of regional disparities in GDP per capita in Italy has been studied by calculating the average difference between regions in 1990 and 2019. GDP per capita values were collected for each region, and the absolute difference between the GDP per capita values of each region pair was computed. These individual differences were then summed up and divided by the total number of regions to obtain the average difference in GDP per capita between regions for each respective year. This approach quantitatively measured the average economic disparities among regions, providing insights into the varying levels of prosperity across the country. The findings revealed that the average difference in GDP per capita among Italian regions was 18% in 1990, which increased to 32% in 2019.

The findings indicate the substantial influence of GDP per capita in determining disparities in health expenditure per capita between different regions. The distinct coefficients for GDP per capita in 1990 and 2019 suggest that the relationship between GDP per capita and health expenditure per capita has changed over time. Specifically, in 1990, the average difference in GDP per capita among regions was 18%. Considering the coefficient's value of 1.12, this translates to a 20.16% gap in health expenditure per capita. Conversely, in 2019, the average difference in GDP per capita between regions was greater at 32%. However, the smaller coefficient of 0.16 resulted in a reduced impact on health expenditure disparities, with a difference of 5.12% in health expenditure per capita.Despite the growing income disparities, the regional disparities in healthcare have not increased to the same extent.

The study's results emphasize the importance for policymakers to monitor the relationship between GDPs per capita and health expenditure per capita over time and make policy interventions when necessary. While the findings indicate a reduction in health inequalities concerning GDP per capita over time, there remain significant differences between regions, which are cause for concern. To address these disparities, policymakers must identify and address the underlying factors that contribute to unequal access to healthcare services, promoting equitable distribution and improving health outcomes for all individuals.

In light of the findings of this thesis, it is possible to argue that healthcare inequalities among regions have moved in a better direction than regional differences in GDP

per capita. The results of the OLS regressions demonstrate that healthcare disparities among regions have not increased as much as the disparities in GDP per capita over the same period. Therefore, it is crucial to understand the drivers of regionalisation of healthcare administration to mitigate the potential effects of income inequality on healthcare accessibility and equity.

8.2 Evolution of Regional Disparities in the Proportion of the Elderly Population

The second theme that warrants attention is the demographic challenge. In 1990, the average proportion of the population aged 65 and above at the regional level was 0.1482, representing over one-sixth of the total regional population, indicating a significant elderly population in need of healthcare services. By 2019, the average proportion of the population aged 65 and above had increased to 0.2315, signifying that a quarter of the regional population, on average, was comprised of elderly individuals requiring healthcare services. The changing coefficients associated with the population variable in 1990 and 2019 reveal a shift in the relationship between the proportion of older people and public health expenditure per capita over time. Specifically, in 1990, the coefficient was negative (-0.221), suggesting that higher proportions of elderly individuals corresponded to lower levels of public health expenditure per capita. In contrast, in 2019, the coefficient becomes positive (0.14), indicating an increased significance of the proportion of elderly people on regional public health expenditure per capita following the decentralisation reform.

However, it should be noted that the p-value (0.35) indicates that the relationship – even if positive – is not statistically significant in 2019. These findings may initially appear contradictory, as previous literature has consistently demonstrated that an ageing population significantly increases public healthcare expenditure due to their greater healthcare needs (Li et al., 2020; De Meijer et al., 2013; Williams et al., 2019).

Nonetheless, the increased significance found in the model for 2019 compared to 1990 may serve as an early indication of the impact of an ageing population. It is possible that the effects of population ageing will become more pronounced in the coming years. Overall, as the proportion of older adults in the population continues to rise, regional healthcare systems are likely to face increasing pressure.

Future research endeavours should delve into the investigation of supplementary factors that contribute to health disparities, as well as explore the underlying causes behind the divergent trends observed in the evolution of regional differences in GDP per capita and health inequalities. Such studies hold the potential to inform policy interventions aimed at mitigating health disparities and fostering a more equitable distribution of healthcare services. Moreover, as highlighted by De Meijer et al. (2013), future research should prioritise examining the alterations in health outcomes that elucidate the impact of increased life expectancy on health expenditures, while also exploring the intricate interactions between population ageing and other societal factors that drive expenditure growth.

9   Limitations

This study is subject to several limitations, which will be highlighted in this chapter. One notable limitation is the small number of observations, which is inherent to the nature of the research context. With only 20 Italian regions available for analysis, it was not feasible to obtain a larger sample size. This limited sample size significantly constrains the effectiveness of the model used. Consequently, the findings may not be fully generalisable beyond the specific regions included in the study. While efforts were made to ensure the representativeness of the sample, it is important to acknowledge that the results may not fully capture the diversity and nuances present across all Italian regions. Caution should be exercised when extrapolating these findings to other regions or attempting to make broader generalisations. Despite this inherent limitation, this study still provides valuable insights within the scope of the available sample and lays the groundwork for future research to delve deeper into the topic.

Another limitation is the absence of control variables in the models used. The research scope of this study focuses specifically on examining the direct relationship between regional-level GDP per capita, the proportion of the population aged 65 and above, and the number of university students per capita and public health expenditure per capita. By narrowing the focus to these specific independent variables, this study aims to provide insights into the direct impacts of these factors on public health expenditure at the regional level, using them as indicators for regional health disparities. Given this focused research objective, the inclusion of additional control variables that are not directly related to the research question may not be necessary. By analysing the relationships between these primary independent variables and the dependent variable without the inclusion of control variables, the study aims to gain a more precise understanding of the unique effects of these factors on public health expenditure, both before and after the decentralisation reform.

10 Conclusions

In conclusion, the analysis of the results demonstrates that GDP per capita emerges as a robust predictor of public health expenditure per capita, consistently influencing both models examined. Conversely, the variables representing the proportion of the population aged 65 and above and the number of university students per capita did not exhibit statistically significant effects, although their significance did show a slight increase in the second model. These findings contribute to our understanding of the factors influencing public health expenditure allocation and emphasize the central role of economic indicators in shaping healthcare financing decisions, before as well as after the 1992 regionalisation reform. It has been demonstrated that while regional disparities in GDP per capita have worsened between 1990 and 2019, the opposite holds true for healthcare inequalities as measured by public health expenditure per capita. This suggests that since the implementation of the healthcare system management decentralisation reform, additional indicators have emerged as influential factors in shaping public health expenditure per capita and enhancing disparities between North and South of Italy.

Further research is warranted to explore the nuanced relationships between demographic factors and healthcare expenditures, considering additional contextual variables and employing more sophisticated analytical approaches. Such investigations will advance our knowledge and inform evidence-based policy strategies aimed at achieving more equitable and efficient healthcare resource allocation.

The primary objective of this thesis was to examine the impact of regionalisation on health inequalities between North and South Italy. The study findings indicate that although there are notable variations in health outcomes and the allocation of healthcare resources among different regions, there is no evidence to support the notion that decentralisation has resulted in an escalation of health disparities. Nevertheless, it is undeniable that the original aim of the decentralisation reform, to diminish healthcare disparities among regions, remains unaccomplished even three decades later. Southern regions of Italy persist as the most disadvantaged, with individuals born in these regions still facing unequal access to healthcare and exhibiting divergent health outcomes compared to individuals born in other regions

Therefore, the outcomes of this thesis underscore the necessity for sustained efforts to reduce health inequalities across regions in Italy. This entails addressing economic and demographic factors that contribute to disparities, as well as ensuring equitable availability of healthcare services and resources for all individuals, regardless of their geographical location. Policymakers and healthcare providers must persistently prioritize these endeavours to enhance the health outcomes and well-being of all Italians, irrespective of their regional affiliations.

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