

DEPARTMENT OF ECONOMICS AND FINANCE

CHAIR OF PUBLIC ECONOMICS

***FROM A GLOBAL CRISIS TO A SUSTAINABLE FUTURE:
UNDERSTANDING THE IMPACT OF COVID-19 ON THREE
DIFFERENT HEALTHCARE SYSTEMS AND SHAPING FUTURE
CHALLENGES***

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Introduction

“The only victor in war is medicine. We are in a war right now. It happens to be with a virus, but the victor in this could be medicine because we are able to do things, such as having doctors be licensed across state lines, that we have spent years trying to do. This disaster allowed us to get that taken care of. We keep thinking about what is the future and what are the tools we can build to help these incredible providers take care of people in a better way.” (Feinberg David, 2020)

The Covid-19 pandemic has been an unprecedented global crisis that has profoundly and significantly affected different healthcare systems around the world. The outbreak of the virus has challenged the stability and, in particular, the capacity of healthcare systems to provide adequate medical services and support not only to the citizens affected by the virus itself, but also to those affected by other serious chronic illnesses, and, as such, in dire need of regular medical treatments. In response, in order to contain the spreading of the disease, different countries have implemented drastic measures, ranging from social-distancing reforms to increased testing and tracing efforts.

Nevertheless, the speed, the strength and the immediacy of the propagation of the virus have represented the primary obstacle for national authorities when trying to implement measures to address the situation. For this reason, the often-delayed and insufficient responses have fallen short of expectations. Globally, independent national authorities have responded in significantly differing ways to the pandemic situation taking into account, among the various factors, the different nature and structure of their respective healthcare systems.

The main aim of this thesis is to question and assess, through the lens of a deep and, most importantly, critical analysis whether, and eventually to what extent, implemented policies have been beneficial to the containment of the contagion. Therefore, the first chapter focuses on understanding the existing healthcare systems and, in particular, the *Beveridge Model*, and its application in Italy, the *Bismarck Model*, and its application in Germany and, lastly, the *Private Health Insurance Model*, and its application in the United States of America. The purpose of this introductory chapter is to grasp the differences in terms of institutional agreements, operational mechanisms and coverage among different systems, that will be crucial when, in later chapters, the thesis will attempt to reason on the different responses implemented by authorities. Clearly, three years after the outbreak of the pandemic, healthcare systems in several countries of the world have not yet managed to recover. The consequences stemming from the overwhelming of the healthcare infrastructure still represent an open account to be settled. However, in order to get the full picture, chapter two is centered on the description of Covid-19, and, a data-driven understanding of its impact on the above-mentioned health infrastructures. In this specific regard, the core of this thesis, chapter three and chapter four will concentrate on three aspects related to the consequences of the pandemic: the impact on healthcare workers, the impact on hospitalization and, ultimately, the implications for sanitary structures and for the production of medical equipment. The description, starting from Chapter 2, will be focused on the attempt to ascertain whether healthcare systems were adequately prepared, despite the pandemic being an unexpected event, and which, between the models analyzed, managed to provide the highest level of efficiency and coverage to all citizens in the hardest phases of the

emergency. This analysis will be introduced by a theoretical description of the policies that authorities and privates have decided to implement.

The fifth and conclusive chapter tries, given the findings in the previous chapters, to create a comprehensive model for building future healthcare policies: understanding where and how policymakers may decide to intervene, in view of strengthening the financial sustainability and the resilience of their healthcare system, because “*preventing suffering before it happens is the long-term answer*” (Kelly Kelleher, 2020)

Chapter 1: Existing Models of Healthcare

The definition of healthcare systems has changed and evolved over time. The most widely-accepted definition has been published, in 2007, by the World Health Organization (WHO), that has defined a healthcare system as “a system of all organizations, people and actions whose primary intentions are to promote, restore or maintain health” (World Health Organization, 2007). Moreover, in the Article, the WHO also proposes the main functions that an efficient healthcare system should provide to the society: (i) *health service provision*, (ii) *health generation of resources* (investment in resources and training of workers), (iii) *stewardship* and (iv) *health financing* (World Health Organization, 2007).

The provision of healthcare services is a fundamental aspect of economic and social development and well-being. When economists and scholars attempt to provide an utter, transparent and fair evaluation concerning the degree of equality among citizens, efficiency in healthcare provision represents one of the most important aspect that is taken into consideration. The argument around efficiency in and access to healthcare provision has been at the centre of heated discussion and debates. Political and economic instability, demographic changes, technological advancements and, recently, shortage in workforce, are among the main factors impinging upon instability in healthcare provision.

Healthcare systems must be designed in order to be adaptable and resilient to the several challenges that may arise. Moreover, due to different ideologies, needs and cultural backgrounds of different countries, medical service mechanisms have undergone through profound and radical changes in their functioning and their structure. In each country, healthcare systems have evolved over time, following the attempts of authorities to create a model that suits the social, political and economic needs of the population. This process of evolution and development has resulted in the creation of a multitude of different and uneven systems across and within nations. In these regards, the Italian cases is emblematic: the quality, the organization and the efficiency related to medical care services differ across cities, with a significant gap between northern and southern regions.

The publication dated 1987, promoted by the *Organization for Economic Cooperation and Development (OECD)* and supervised by George J. Schieber¹, attempting to study the approaches toward healthcare services, concluded that, in modern societies, exist three different healthcare models, implemented, in the majority of the cases, as national systems, and based on three criteria: (i) coverage (portion of the population covered by the service in question), (ii) funding (how the service is financed or subsidized) and (iii) ownership’s provision (which entity, in practice, provides the service). The first model identified is the “*Beveridge Model*”, named after Sir William Beveridge, founder of the UK’s national health service. It is also known as “*Universalistic System*” because of its features: it is a government-run system where healthcare services are provided to all citizens free of charge. In other words, it guarantees universal coverage to all the citizens, regardless of their cultural backgrounds and of their income. Virtuous examples of the use of this model are represented by the majority of European countries, including Italy, and Great Britain.

¹ “[European Health System Typologies: Last 30 Years Under Review](#)” (2017, A.I. Pereira Tavares)

The description then moves towards the second healthcare model, that is the “*Bismarck Model*”, named after the former German chancellor Otto von Bismarck, and is used, among the various nations, in Germany. Typically, it employs a national non-profit insurance scheme, jointly-funded by employers and employees through payroll deductions and enables to provide services to the majority of the population.

The last model identified in the article is the “*Private Health Insurance*” model, which is predominantly prevalent in the United States, and it consists of private and voluntary health insurance programs. Medical services can be availed either from public or private providers.

The classification made by the OECD article is not yet complete, as it is currently lacking the fourth, and last, healthcare model, predominantly diffused in poor and undeveloped countries, the so-called “*Out-of-Pocket*” (*OOP*) Model. The countries that adopted this model allow the possibility of accessing healthcare services only to the subset of the population that can afford them. Indeed, in this model, the patient pays out of his or her pocket for the medical services needed, and there is no possibility of accessing national or private insurance programmes.

This introductory chapter is centered on the examination of the above-mentioned three main healthcare models, with a special attention devoted to inherent differences, operational mechanisms and financing or subsidization arrangements.

The description will follow the same sequence that has been outlined above: Beveridge, Bismarck and, lastly, the Private Health Insurance Model.

1.1 – The Beveridge Healthcare Model and the Italian “Sistema Sanitario Nazionale”

Sir William Beveridge was an esteemed political and economic personality in the United Kingdom during the 20th century. He managed to conceptualize the “*Beveridge Model*” in 1942, during the Second World War, when he authored a report entitled “*Social Insurance and Allied Services*”, under the directives of the former British Minister of Health Ernest Brown.

The model was established under the support of the Labour Party that, after having secured themselves the victory in the elections of 1945, managed to establish the reformed *National Health Service (NHS)* in 1948, which was joined by the health services of England, Wales, Scotland and Northern Ireland, that, however, remained independent from one another.

Beveridge’s Publication reflects his attempts to provide reforms for the *Welfare System* to address what he identified as the “*five giants on the road of reconstruction (...): want (...), disease, ignorance, squalor and idleness*” (Beveridge, 1942). In the following decades, several other countries in Europe decided to adhere to this model, including Italy and Sweden.

The distinguishing feature of the model was the founding coming from a single public authority: the State, that acted under the role of a “*single-payer*”, excluding, theoretically, any kind of private support. The sole presence of the government in the healthcare market contributed to the almost-complete removal of competition, stimulating greater control over prices: public institutions did not bear the same level of administrative and operating costs as private companies.

The position of “*single-payer*” held by national authorities implies that the staff and the personnel employed in these public medical entities ought to be considered as government employees.

Moreover, the fact that this system was fully-subsidized by public revenues, through taxation, rendered medical care completely free and, as a result, patients, at least theoretically, didn’t incur into any out-of-pocket expenses. In practice, however, users are often called into personal expenses to access a number of different medical services.

The underlying idea, however, remains: regardless of income or cultural background of any citizen, the coverage is universal and guaranteed by the State.

Notwithstanding with these significant advantages, one of the critics raised against this system refers to the concern of the prolonged waiting lists, that may, in some circumstances, result in a fatality. The reasoning behind this problem lies in the fact that, since the service is freely offered to all citizens, without any distinction, individuals may seek medical care excessively, even in unnecessary circumstances. This is the phenomenon known as “Preference Revelation” in economics: it leads, practically, to a surge in unnecessary demand, that triggers increased costs and longer waiting times.

Furthermore, if the previous concern is related to citizens’ behavior, other issues to be taken into account may arise due to the dominant presence of the State. The response of authorities to emergencies may be dampened due to external factors, including, but not limited to, financial crisis, wars and outbreak of pandemic situations, as the pandemic that the World has witnessed since the beginning of 2020 or the Russia-Ukraine war that is devastating Eastern Europe. In such circumstances, there is a significant risk of reduction in public revenues, with a parallel larger influx of patients, that create a situation for national authorities in which it is almost impossible to avoid the possibility of incurring into a budget deficit or increasing tax levies. Therefore, in order to ensure financial sustainability of the system as a whole, it is essential to build an emergency fund over time.

As said in the introduction to this chapter, the Beveridge Model is extensively used in different European nations, including Italy, Spain and the United Kingdom. Adopting a global perspective, another virtuous example is represented by Canada, in Northern America, where the State finances the majority of healthcare services.

For the central topic of this thesis, the description will focus on the Italian healthcare system, its development, its operating mechanisms, its financing and, lastly, its provision.

1.1.1 – Historical Backgrounds of the Italian “Sistema Sanitario Nazionale”

The Italian “*Sistema Sanitario Nazionale*” (SSN) represents the outcome of a prolonged process that has experienced significant changes starting from the second post-war period until more recent years, particularly in terms of operational mechanisms, population coverage and financing structure.

In the period between 1945 and 1956, the healthcare system was based on a form of “*incipient social security*”, financially sustained through the combination of state and charity donations.

Subsequently, until 1974, for nearly two decades, national authorities focused on developing a financially-stable and complete model, centered on the principle of *social insurance*.

The formal acknowledgement of a definite model, however, occurred only in 1980, with the implementation of the “*Servizio Sanitario Nazionale*” (SSN).

Over the decades, in line with the principles underlying the SSN, the percentage of the population that had access to medical services exponentially increased, going from the 33% of the total citizens in 1946, immediately after the end of the second post-war period, to 95% in 1979, that meant, for the time, an amount of 53.4 million people.

Nowadays, the system guarantees direct, and most importantly, free medical assistance for every citizen, with no exceptions and distinctions.

As the first graph suggests, Italy finds itself, among OECD Countries², in the first place in terms of population coverage, while performs worse in terms of population satisfaction, averaging less than the average of the former, as the second graph suggests.

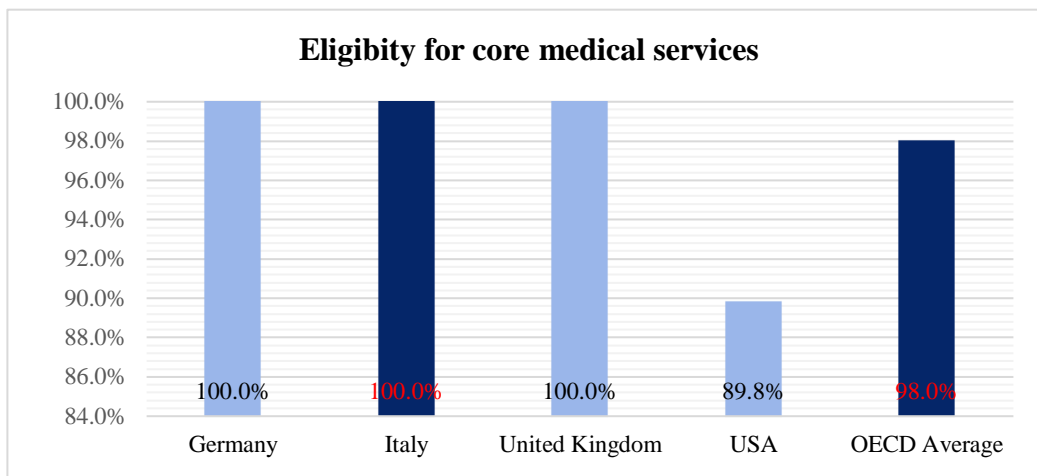


Figure 1: Eligibility for Core Medical Services
Source: OECD, "Health at a Glance 2021" (data from 2019)

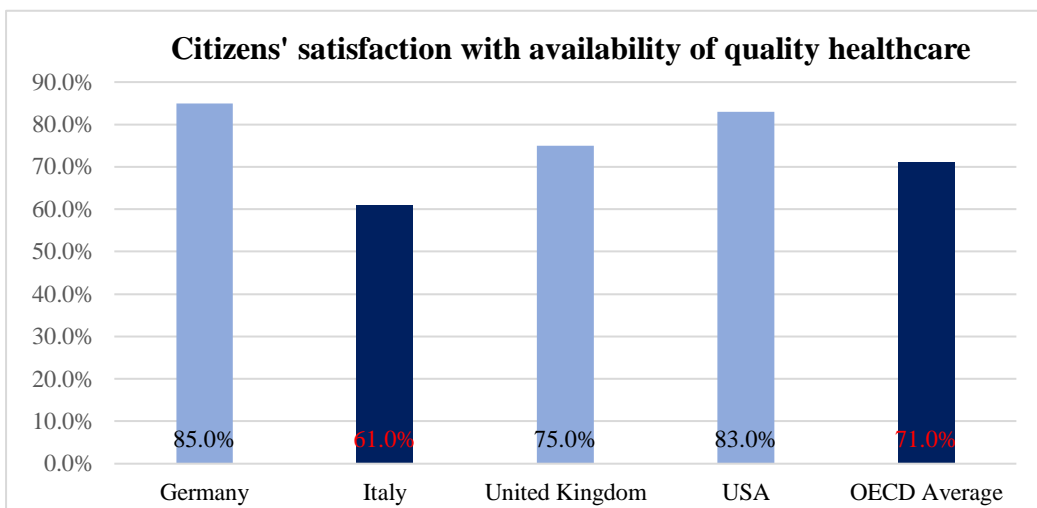


Figure 2: Satisfaction toward availability of quality healthcare, expressed as percentage of the total population
Source: OECD, "Health at a Glance 2021" (data from 2019)

Public interventions have always been predominant: in 1888, former Italian Prime Minister *Francesco Crispi* (Ribera, 1818 – Naples, 1901) obliged each municipality to institute and appoint

² OECD Countries (in alphabetical order): Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, South Korea, Sweden, Switzerland, Turkey, United Kingdom, United States

the “*Medico Condotta*”, whose duties consisted in providing medical assistance to the poorest, that in case of recognized needs, had the right to be provided with free hospitalization, medical and pharmaceutical assistance, paid by the municipalities themselves.

Management and Assistance, before the formal introduction of the SSN, were regulated by two distinct public entities: *INAIL*³ and *INPS*⁴, coupled with, in the period ranging from 1940 to 1977, other mutual agencies, with each of them being dedicated to the management of coverage of a specific category of workers; in particular, *ENPAS*⁵ was devoted to ensure medical assistance for publicly-employed workers, while *INAM*⁶ acquired the management of compulsory insurance to provide, for workers and their respective families, medical treatments.

The system, that, before the institution of the SSN, was based on compulsory insurance, proved not to be economically sustainable. Indeed, starting from 1965, the excessive extension of medical assistance to new beneficiaries, alongside with an insufficient increase in premiums and contributions, triggered the annual deficit of mutual funds to rise from a 7% on an annual basis to an intolerable 33%.

For this reason, in 1975, the Italian Government, chaired by former Prime Minister *Aldo Moro* (Maglie, 1916 – Roma, 1978), decided to begin the process towards a *National Health System*, formally started with the delegation of the management of medical assistance to regions.

In 1978, almost all political parties, with the only exception of the Italian Liberal Party, approved the healthcare reform⁷, that led to the institution, in 1980, of the *Sistema Sanitario Nazionale*.

1.1.2 – Structure and Governance of Sistema Sanitario Nazionale

Nowadays, after having undergone profound and significant changes, the SSN is organized on two levels of governance, that share a political nature, managed, respectively, by the State and the Regions, and one level of management, run by local entities, that have, as their main target, the provision of medical services to the population. The single level of management is to be divided between “*Aziende Unità Sanitarie Locali*” (*AUSL*) and “*Aziende Ospedaliere*” (*AO*), with the difference that, when referring to *Aziende Ospedaliere*, we indicate one single hospital, whereas by referring to *AUSL*, the agency may include several structures, ranging from clinical offices, to hospitals and laboratories.

One further distinction is needed, in order to understand the management of the SSN: *AUSL* represents the entities that practically provide medical services to the population and are independent in terms of administration and organization. However, they may oversee either an entire regional territory, like in the case of Molise or Valle d’Aosta, or they may be limited to the coverage of a provincial territory, similarly to what happens in the case of Perugia and Potenza. Moreover, in the case of overcrowded municipalities or provinces, as Rome or Naples, there may be several *AUSLs*, each dealing with a particular area.

³ *INAIL*: Istituto Nazionale Assicurazione Infortuni sul Lavoro

⁴ *INPS*: Istituto Nazionale Previdenza Sociale

⁵ *ENPAS*: Ente Nazionale di Previdenza e Assistenza per i dipendenti Statali

⁶ *INAM*: Istituto Nazionale per l’Assicurazione contro le Malattie

⁷ Law n° 833 of 1978: represents the birth of the Italian *Sistema Sanitario Nazionale*

Lastly, according to the region, AUSL assumes different denominations, including: “*Aziende Sanitarie Locali*” (ASL), in the case of Lazio, Campania or Piemonte, “*Azienda Sanitaria Unica Regionale*” (ASUR), in the case of Marche, and “*Azienda Sanitaria Provinciale*” (ASP), in the case of Sicilia, with each province adding its own denomination at the end.

With these distinctions and clarifications made, it is now possible to better understand and classify all the different functions that each level of governance and management perform.

The highest level of governance is represented by the State itself; it has the duty to (i) legislate and enact “framework laws”, the English translation of the Italian “*leggi quadro*”, (ii) establish and distinguish the levels of essential assistance, known as “*Livelli Essenziali di Assistenza*” (LEA), (iii) partially finance the SSN and (iv) establish the national budget, overseeing also limits for the regions and interventions in cases of excessive deficit (Mapelli, 2012).

Duties and competences of the Regions are set in Article 117 of the Italian Constitution. In particular, it establishes that they supervise and govern upon all the matters that are not under the direct control of the State, but, these responsibilities must be conducted according to general principles and regulations set by the State itself.

Furthermore, they are independent for what concerns the financing structure of regional healthcare: not only they do collect taxes from citizens, but are also free to change tax rates. Funds obtained through taxation will then be devoted to sustaining local providers (AUSL and AO), on which regions exert control and of whom regions have to cover eventual excessive deficits.

When the SSN was originally built, it was based on three levels of governance, with the third being covered by the “*Unità Sanitarie Locali*” (USL).

These were legally-independent entities with their own assemblies, composed of members appointed by the municipalities of the territories covered, and their own committee with delegation to the management of medical services.

The process of conversion from USLs to AUSLs and AOs, that occurred since 1992, represents the consequences of the process of “*aziendalizzazione*”, that occurs whenever a former public entity changes its business model and its organization in view of achieving a more privatistic structure, even remaining, formally, a public entity. Practically, it consists in the appointment of a general director, the creation of several departments, each with its own delegation, and the target of achieving a balanced budget, with profit purposes.

1.1.3 – Financing and Spending of the SSN

The financial dimension of the Italian Sistema Sanitario Nazionale is particularly complex: it involves the combination of a significant amount of public expenditure coming from the Government and a mix of public and private providers.

Tax revenues coming from households and enterprises constitute the main source of financing, while the allocation of these resources belongs to the responsibilities of national and regional authorities. Moreover, even though the SSN remains the main provider of medical services, the role of private providers is becoming increasingly remarkable, due to the problems impinging upon public healthcare. On the other hand, the public financing of the SSN, that represents its major component,

is objectively more complicated than it seems. Indeed, despite the fact that the majority of revenues derive from tax levies, the public financing of the Italian healthcare system is structured on three different levels stretching from state to local levels.

Local financing, the narrowest level, mainly concerns the financing through health companies, including, but not limited to AUSLs and AOs. Revenues, in this case, come from two main sources: (i) tickets and (ii) intramoenia activities provided by public employees⁸ - the total amount is definite, and it represents the result of an institutional agreement between the Government and Regional Authorities. The intermediate level of financing comes from regional revenues: *regional taxes*, including (i) *IRAP* (Imposta Regionale sulle Attività Produttive), fixed at 4.25%, and (ii) *IRPEF* (Imposta sul Reddito delle Persone Fisiche), an additional regional tax set at 0.9% of personal income, and (iii) revenues coming from the *co-participation of regions with special statute*⁹, that are called to intervene in the case in which the amount needed from regional funds is not achieved, until the point in which these needs are met. An additional noteworthy aspect about regional financing is that, since 2001 and with the implementation of fiscal federalism, regions are allowed, in cases of emergencies or needs, to finance their systems by incurring into a budget deficit, that is, issuing debt.

Before concluding and diving into the highest level of financing, it is necessary to highlight that regional financing is not consistent and equal across the whole peninsula. Indeed, in central and northern regions, such as Lazio and Lombardia, the regional tax revenues accounts for, respectively, 37% and 40% (data from 2020), while in southern regions, such as Calabria, it accounts only for the 8%. This is a straightforward consequence of the fact that tax revenues are closely bounded to local economies and citizens' income levels. This explains the phenomenon of "health federalism", that causes regions with high average income levels to provide more efficient medical services than regions with lower average income levels.

The highest level, represented by state financing, sustains the gap between regional need for healthcare spending and regional and local financing – in other words, it is apt at covering eventual deficits not covered by previously-mentioned resources.

Its target is to guarantee that, regardless of the inability of some regions to gather resources from their territories, the same standards of equality, efficiency and coverage (i.e. LEAs) are met in all the regions. For this reason, state financing is often addressed to as "*fondo perequativo*".

The needed resources are collected mainly through (i) *value-added taxes* or, more rarely, (ii) *excise on fuels*. Broadly speaking, Italy has devoted, in 2020, the 7.9% of its GDP to public healthcare expenditures.

Private funding, on the other hand, represents approximately 21% of the total financing of the Italian healthcare system. Italy, in this case, finds itself approximately at the average level among OECD Countries, where the two extrema are represented, respectively, by Norway, where only the 16% of total health financing comes from private sources, and United States, where it contributes to the 54% of the total. However, it is important to point out that integrative health insurance plans are undoubtedly rising, in terms of citizens' contributions. In particular, the main portion of the private

⁸ "*Intramoenia activities*": services provided outside normal working hours by doctors and nurses, that utilize hospitals and diagnostic structures

⁹ "*Regioni a Statuto Speciale*": Friuli Venezia-Giulia, Sicilia, Sardegna, Trentino Alto-Adige, Valle d'Aosta

component refers to direct out-of-pocket expenses, for services such as *drugs* or *dental care*, coupled with “*tickets*”, commonly used for specialist visitations.

Another component is made of insurance premium payments and contributions, in particular for *voluntary mutual insurance* and *health insurance*, in a proportion of two-to-one.

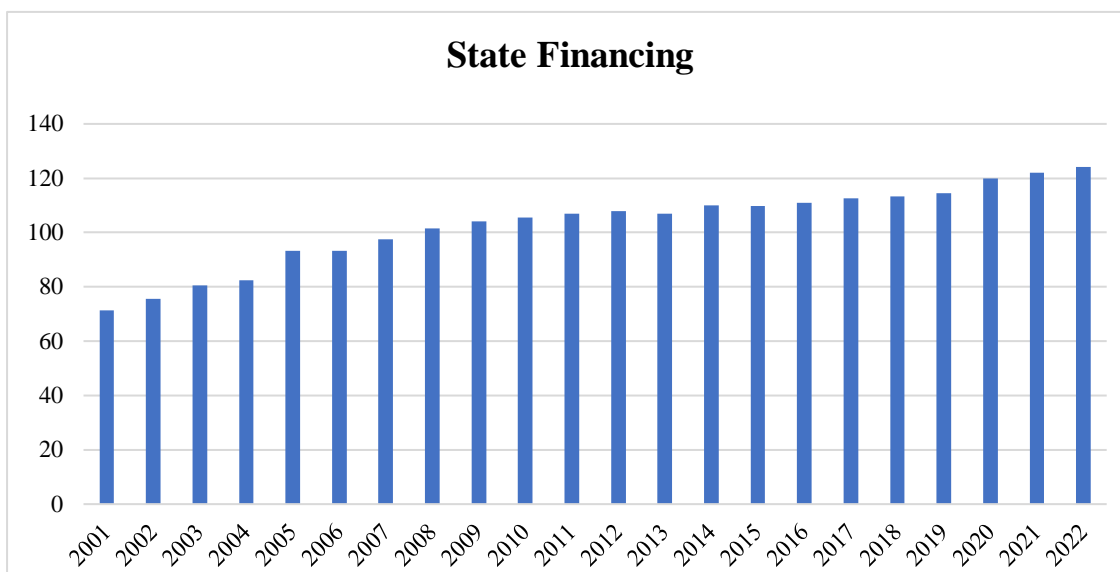


Figure 3: Highest level SSN Financing, expressed in billion of Euro
 Source: “*Il finanziamento del Servizio Sanitario Nazionale*”, Ministero della Salute

In the future, the financing structure of the Italian healthcare system is likely to change, at the expense of citizens. The increases in life expectancy and the ageing of the population, respectively due to better socio-medical conditions and lower birth rate, are likely to trigger an increase in fiscal contribution, in the form of a rise in IRPEF contribution, in order to face the increasing medical needs to provide universal coverage to the whole population.

Before describing where the resources obtained through the above-mentioned sources of financing end up, that is the spending of the SSN, it is important to understand what is meant for “*health spending*”. This description will be useful also for the description of the German and the American Healthcare Systems.

“*Health Spending*”, indeed, is defined as a measure of the “*final consumption of health care goods and services (i.e. current health expenditure) including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments*” (OECD, 2021). Similarly, to what happens in the case of financing, healthcare expenditure can be divided between public and private, with the former mainly concerning expenditure on public health entities, AUSLs and AOs, and the latter being related to purchases in the private market in a broad sense, ranging from purchases of pharmaceuticals to purchases of tickets for specialist visitations.

According to the data published by the Italian “*Nuovo Sistema Informativo Sanitario*” (NSIS), updated to the last quarter of 2021, and as reported by the Italian “*Ministero della Salute*”, in 2021, the

expenditure burdened exclusively by the SSN (not shown in the table)¹⁰ amounted to approximately 130,2 billion of Euro, corresponding to the 7.3% of Italian GDP.

If compared to data from 2020, in absolute terms, SSN expenditure has risen for a total amount of approximately 3,4 billion, corresponding to a percentage increase of 2.6%. However, due to the recovery of the Italian economy, following the financial strains during lockdown, the incidence of SSN spending, with respect to the total GDP, has fallen from 7.7% to 7.3%.

In particular, these resources are devoted to (i) *hospital care*, (ii) *medical services for diagnostical assistance and dental care*, (iii) *pharmaceutical products purchases*, (iv) *purchases of medical equipment* and (v) *administration expenses*.

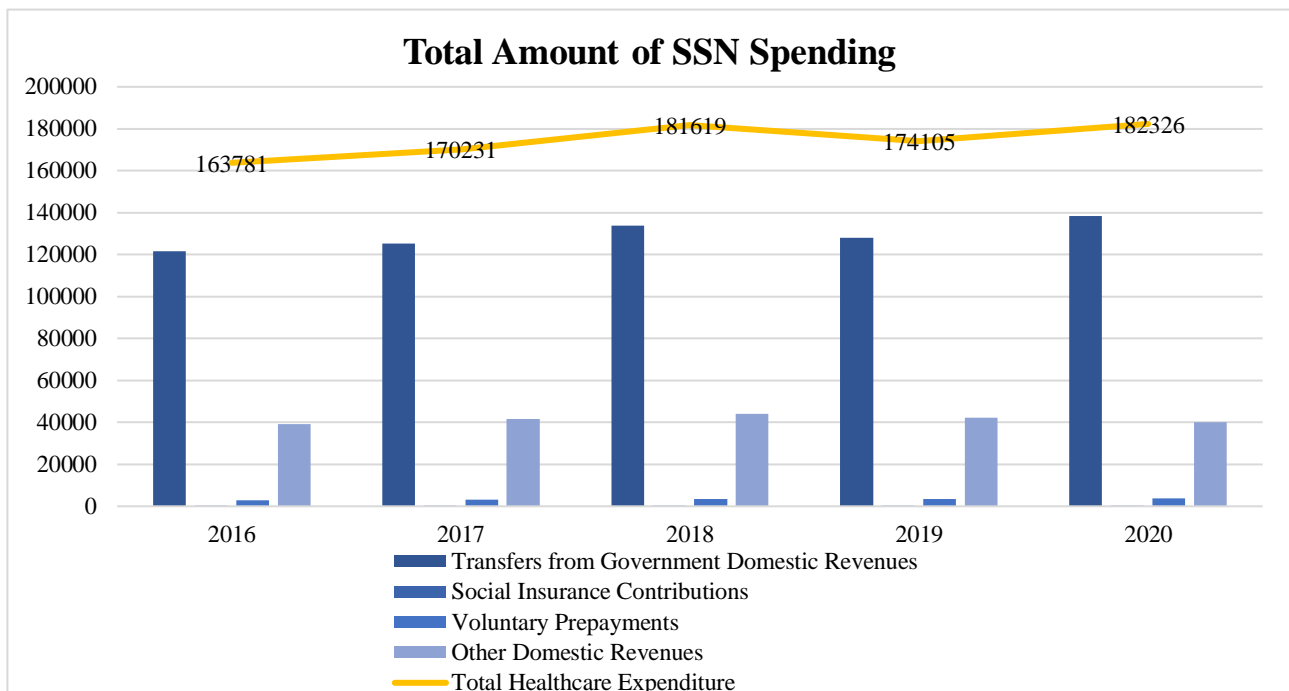


Figure 4: Total Healthcare Expenditure in Italy, from public and private entities – expressed in millions of US Dollars
 Source: WHO, *Global Health Expenditure Database*

Nevertheless, further specifications are needed: spending on hospital care includes two categories of structures, public hospitals and affiliated private facilities; moreover, beyond the boundaries of purchases of pharmaceutical products and medical equipment are found only the items that are effectively utilized by doctors and nurses within public care.

Private spending, in 2021, despite being still below pre-pandemic levels, showed a 7.4% increase with respect to 2020. In this sense, private spending is a cyclical element, positively correlated with GDP. In particular, researches have forecasted that the amount spent by citizens on private healthcare in Italy is likely to suffer a strong increase within the next years.

The mismanagement of the waiting lists, the increasing demand for medical services stemming from the pandemic and the aging of the society are overwhelming the Italian public healthcare system,

¹⁰ Regions, Provinces and other entities

causing an increasing number of citizens to seek out private medical care, hoping for shorter hospitalization, analysis and diagnostic tests.

According to a research published in 2021 by the Italian *Istituto nazionale di Statistica (ISTAT)*, between 2020 and 2021, public hospital admissions and services have significantly decreased (respectively, -21% in 2020 with respect to 2019 and -14.9% in 2021 with respect to 2019) and an increasing number of doctors are leaving public care (approximately 7 doctors per day) because the latter is not as profitable as private care.

For these reasons, over than one in two citizens (precisely, 54%) are entrusting private medical care for their treatments. This trend, bounded to show more dramatic data in the next years, hides a subtler fact about Italy: the gap between those who can afford and those who cannot afford private medical care is widening fast, and for this reason, when waiting lists are excessively prolonged, and when their economic conditions do not allow to access private healthcare, an increasing number of citizens decides to renounce to treatments.

Broadly speaking, private spending is devoted to: (i) *specialist assistance and dental care* (37%), (ii) *medical drugs expenses and tickets* (26%), (iii) *payments towards private clinics* (29%) and (iv) *purchases of therapeutic and sanitary articles* (17%).

1.1.4 – Provision of Medical Assistance in the SSN

The existing “competition” between public and private extends also to the provision of medical assistance, where the 51% is attributable to the former, in publicly-recognized structures, and the remaining to the latter, under the name of private specialists in private clinics.

The Italian system is structured as a multi-level organization, divided between *primary*, that includes basic medical assistance, *secondary*, made by specialistic assistance, and *tertiary*, which embodies higher specialization.

The basic level, as said, includes basic nursing and medical services, which drive the access of patients to superior level of assistance. The mechanism works thanks to the leading figure of the “*medico di base*”, that acts like a gatekeeper, deciding how a patient has to be treated and how to face eventual difficulties. By law, citizens are obliged to be registered within a practitioner’s office in order, in case of needs, to access higher-level care.

Other basic services stretch from vaccinations, to residential care and diagnostic centres.

Secondary-level assistance, on the other hand, consists of all the medical services that requires a higher degree of expertise, knowledge and specialization, due to the severity of the disease itself.

It is provided, in the majority of cases, by public hospitals and specialized private clinics. The specializations covered, as formally defined and recognized by the Minister of Health, are 64, and are divided in 5 different categories: (i) *basic specialization*, (ii) *medium level of assistance*, (iii) *intensive level of assistance*, (iv) *intensive care* and (v) *rehabilitation and long-term care*.

In order to access this level of assistance, excluding cases of emergencies, pediatrics, gynecology and dental treatments, the citizen must be in possess of the authorization signed by the medical practitioner.

The highest level of assistance, that is not evenly distributed and available on the whole Italian territory, includes all the treatments required for rare or extremely rare diseases or circumstances which require ad-hoc medical tools.

In terms of providers, unlike the British case, privately-owned entities provide approximately one-third of total medical services in Italy. Public entities, consequently, do not provide the entirety of treatments, neither do provide the majority of them.

In particular, publicly-owned entities represent a corpus not only composed of (i) “*presidi ospedalieri*” (POs), that are structures belonging to AUSLs, but also made of (ii) “*aziende ospedaliere*” (AO), (iii) “*aziende ospedaliere universitarie*” (AOU), (iv) “*istituti di ricovero e cura a carattere scientifico*” (IRCCS) and, lastly, (v) *laboratories and specialist ambulatories*, that range from structures devoted to rehabilitation or addictions treatments.

Private provision, on the other hand, is attributable to different categories of agents and structures affiliated to health providers, but acting, in a sense, for their own profits. Among the most important examples, it is possible to find: (i) *general medical practitioners*, as recognized by law and that operates in a specific territory, (ii) *pediatricians*, (iii) *first-aid stations*, usually named as “*guardie mediche*”, (iv) *pharmacies*, (v) *specialists working in their private offices*, either paid for performance or per-hour worked, and (vi) *other private structures*, ranging from private IRCCS to university or ecclesiastic hospitals.

1.2 – The Bismarck Healthcare Model and the German Healthcare System

The “*Bismarck Model*” is named after his developer, Otto von Bismarck, former chancellor of the Prussian empire. Bismarck’s “*Health Insurance Act*” of 1883 established the first social health insurance in the world, building a system based on the principles of solidarity and self-governance, that have remained at the core of its development thus far.

The system, which remains in use in many advanced economies, is founded on the importance of the working class, as they contribute, for a large part, to the construction of a statutory health insurance fund, through compulsory payroll contributions.

The underlying idea on the insurance principle is that, in exchange for payments, it guarantees the employers and his or her dependents absolute financial coverage against risks stemming from eventual diseases, hospitalization, death or long-term disability.

Unlike the American situation, that will be explored more in depth in the next paragraph, these contributions, functioning like an insurance premium, are not based on the health risk carried by the worker, or, broadly speaking, by the individual, but on his or her income level.

Consequently, one group of society members is composed by all types of workers, obliged, through payroll taxes, to contribute to financing social insurance program, and, as such able to be eligible to benefit from national healthcare services.

Conversely, there exist citizens that, because of disabilities, or because currently unemployed, are not able to afford mandatory contributions. The development of this system enabled them to have access to healthcare services, despite their inability of contributing to the financing of the program.

The situation for them has not always been as it is nowadays. Before 1920s, indeed, citizens who could not afford to pay mandatory contributions, lacked healthcare coverage, and were required to

pay, out-of-their-pocket, for needed medical services, with no assistance, even in emergency situations.

Starting from 1920s, however, national authorities began to provide support for these unfortunate individuals through the implementation of new social policies through public funds, aimed at covering the costs of their insurance programs. The introduction of these social policies transformed the Bismarck system into a more comprehensive healthcare model, laying down the basis for the modern welfare state.

The provision of medical services, broadly speaking, is administered by private non-for-profit entities, while, for what regards the provision of insurance programs, it differs country-by-country. In particular, in developed countries like France or developing ones like South Korea, there is one insurer, whereas, in the country where this system has its origins, Germany, there are multiple insurance providers in competition.

The common aspect between these two entities refers to the close control kept over prices by the Statutory Health Insurance scheme, that remains a public entity – this contributes to keeping medical provisions costs below than in the private market.

The direct financial contribution of both employees and employers has always been a hotly-debated topic, creating both benefits and drawbacks.

Researches (Dizioli & Pinhero, 2012) have assessed that, the mandatory financing of healthcare funds guarantees and stimulates the productivity of the workforce. This is because employees are provided with efficient preventives and immediate healthcare in the case of urgencies. In a sense, then employers and institutions adopt a “proactive” approach towards their workforce, ensuring to themselves an efficient amount of productivity and to their subordinates an efficient quality and quantity of medical services.

Moreover, this productivity stimulation triggers positive consequences on workers’ well-being: confidence in the working of the healthcare system stimulates greater care of the latter in favor of their families, that, in turn, leads to increased job satisfaction and improved morale.

Furthermore, the compulsory participation towards the financing of the health fund of different social groups, them being employees and employers, significantly reduces the financial burden falling on single economic agents, since healthcare costs can be significant, and, in some circumstances unavoidable. This helps in ensuring a smooth functioning of the national system, enabling to better face periods of financial stress.

However, the mandatory contribution of employers may pose a significant financial burden for businesses, and this applies with added strength in cases of small businesses.

Another drawback, concerning in particular the countries in which there are various insurance companies competing against each other, is related to the objective quality of medical services and the coverage offered by different insurance plans. Indeed, different insurance plans may offer different coverage levels, and, particularly for the poorest, it is not economically feasible to access the most expensive and efficient plans.

In addition, when considering the future financial sustainability of this model, it is necessary to consider the impact of the aging population, that triggers an increased demand, and consequently,

increased costs for medical services. This trend, coupled with the rising ratio of retired individuals to working people, with the former not contributing anymore to public funds through payroll taxes, have brought some scholars to question the economic feasibility of this model in the due future.

Currently, Germany adopts a healthcare model that closely resembles the initial and original Bismarck model, specifically in terms of its operational functioning and organization.

It is founded on the basis of four different principles, of which the first and foremost is the *mandatory nature of the insurance*. In particular, every national citizen or permanent resident, and his or her eventual related dependents, are entitled and obliged to be covered by the “*Statutory Health Insurance*” (SHI). It is worth-mentioning that, whenever the gross earnings limit is reached (set, in 2023, at 66.600 euro on a yearly basis), citizens can also decide to opt for *Private Health Insurance* (PHI) plans. According to latest data, the actual contribution rate amounts to 14.6% of wages, to be equally split between employer and employees. The second is the principle of *solidarity*, that finds its application in the jointly-borne cost of medical provision for an additional patient being treated. This concept establishes that “*everyone covered by statutory insurance has an equal right to medical care and continued payment of wages when ill - regardless of their income and premium level*” (National Library of Medicine, 2015). Another feature supporting the principle of solidarity refers to the fact that, up to a certain limit and within the context of the Statutory Health Insurance, premiums are based on the income level of the insured. Accordingly, high-earning citizens would cover a greater part of the medical care utilized by the poorest.

The third principle is related to the *funding through insurance premiums*: the German Federal Statistical Office, named as “*Destatis*” reports that, in 2020, the Statutory Health Insurance contributed to a total of 241,491 million euro, amounting to almost the 55% of the total healthcare expenditure, while Government subsidies contributed for a total amount of 67.9 billion euro, accounting for 15,7% ca. of the total amount. This is emblematic for saying that, in the case of salaried workers, the system is funded through a shared-contribution system. Moreover, as data suggests, often also tax revenue surpluses contribute to the financing of the healthcare system, providing coverage for disabled, unemployed and housewives.

The fourth and last principle governing the German healthcare system is the principle of *self-governance*, that represents the reason why this system is to be considered as largely decentralized. Although the ownership and the setting of general conditions and policies regarding healthcare are centered within the hands of the central state, the practical management and the financial aspect are delegated to sixteen federal states, the *Bundesländer*, that work alongside with the “self-governing bodies”, made of physicians, hospitals, insurance providers and patients.

In summary, Germany’s Healthcare System is regarded as one of the most efficient and appreciated (ref. [Figure 1](#); [Figure 2](#)) healthcare systems in the World.

1.2.1 – Historical Background of German Healthcare System

In 1883, through the “*Health Insurance Act*”, Germany became the first country to develop and introduce a system of mandatory health insurance, following the attempts of Otto von Bismarck.

He aimed, indeed, at building a system capable of providing greater coverage, in terms of population, than the old mutualistic system of the working class, that had significant efficiency gaps. In 1883, indeed, authorities managed to establish the “*Gesetzliche Keankenversicherung*” (*GKV*), the German

compulsory insurance, that contributed to the creation of a framework for Public Health, and to define and properly regulate the roles of doctors, hospitals, insurance funds and contributors.

The introduction of GKV resulted immediately in significant benefits: between 1885 and 1930, nearly the entirety of the working class was able to obtain health coverage upon mandatory contribution. Moreover, in 1918, the coverage was extended to the unemployed, including disabled people and their relatives, gained complete access to healthcare services without having to incur into OOP expenses, as their treatments were (and still are) financed by workers through payroll deductions.

In 1941, before the division of Germany in East and West following the tragic events of the Second World War, it was approved a legislation that allowed citizens, whose income exceeded certain established thresholds, to sign an extended private insurance, on a voluntary basis, nowadays known as “*Private Krankenversicherung*” (*PKV*). Enrollment in this program, however, only implied additional safety for citizens, as they were still involved in the mandatory contribution program. Furthermore, in the same year, GKV was extended to the retired and, finally, in 1975, also students started being covered by the mandatory contribution program, without having to actively contribute to it.

This innovation brought about a significant shift in terms of healthcare provision and accessibility, expanding coverage to previously-served segments of population – in this sense, it was a landmark in the history of social welfare: it set a precedent, for other countries, to follow and represented, at the same time, a critical step towards the establishment of a universal healthcare system. Since the introduction of the GKV program, and its subsequent extensions, the whole German population is now eligible for core medical services; an additional proof of Bismarck Model’s efficiency.

Following the its division in East and West Germany in the second half of 1940s, two different healthcare systems were established. In the eastern part, authorities established a state-centralized system, where authorities managed assistance without the cooperation of privates.

In the western part, on the other hand, it was established a system that closely resembled the pre-war model: a public-assistance model, with public mandatory contributions, in which authorities only had functions of supervision and control, and not enforcement duties.

In this case, indeed, state authorities could only judge over general issues, including, but not limited to, risk coverage and mandatory contributions. Management duties were delegated to private entities, such as national or regional associations of health workers, no-profit insurance funds, private insurance funds and local hospital associations. When Germany was reunified in 1990, with the fall of the Berlin Wall, the western model was adopted in the whole country, highlighting a strong continuity with the pre-war period. Immediately after the Unification, further improvements of the GKV were made, extending health coverage to outpatient care, domestic assistance for disabled or elderly, physical rehabilitation, full-retribution for women during pregnancy (for a period ranging from six to eight weeks before giving birth to six to eight weeks after having given birth) and preventive scanning.

1.2.2 – Structure and Governance of the German Healthcare System

The governance structure of German healthcare significantly resembles the German political structure, both being characterized by *federalism* and *corporatism*. This implies that public responsibilities are shared among the *Bund*, the Central State, the *Länder*¹¹, the 16 German Federal States, and *Corporate Bodies*, representative of medical practitioners or industries.

Bund and Länder, alongside with Municipalities, are the entities responsible for the safeguard of health, similarly to the Italian system. Broadly speaking, they perform different duties, allowing a significant reduction in the time needed for bureaucracy.

The highest level, as usual, is represented by the Bund, that has no effective influence over healthcare provision. Indeed, its duties are more centered on the management of more general issues, that stretch from the economic stability of healthcare infrastructures to the administration and the prevention of dangerous and infectious diseases, including Covid-19.

Moreover, remaining within the boundaries of its duties, Bund also deliberates and delegates specific duties to specific committees: the “*Konzertierte Aktion im Gesundheitswesen*” (KAiG)¹², introduced in 1977, focuses on the overall status of the healthcare system and deliberates on procedures to be implemented following the directives of the Bund itself, while to the “*Ethikkommission*”¹³ are attributed ethical issues, including abortion, artificial insemination, genetic researches and everything related to the care and treatments of patients in the terminal stage of their diseases.

Overall, Bund maintains a marginal role with respect to the operative stage, but its impact in terms of adherence to Constitutional Law and, generally speaking, legislative decisions is remarkable. The intermediary level, represented by the sixteen Länder, holds the majority of power in terms of operational and executive power. Practically, owning the main medical structures in their territories, they are responsible of proposing, approving and, lastly, supervising plans and projects for public hospital and clinics. Moreover, according to the underlying idea that they are more familiar, than the Central Government, with incumbent needs of citizens, Länder share also the burden of allocating funds to private and public sanitary institutions.

To Municipalities, that made up the bottom level, are left only duties concerning the planification and the management of local structures, according to precise directives set by Länder, by appointing local public health offices.

Therefore, the general framework is divided between the three above-mentioned regulatory bodies, sharing legislative, executive and operational power, as well as the monitoring of indicators and results in view of providing timely responses to the feedbacks coming from the committees in direct contact with citizens, and private institutions, to whom the management of public institutions is often delegated because of their greater financial resources and better technical expertise.

¹¹ Germany is a *Federal Republic*, and as such is divided in *Länder* (plur.), the *16 Federal States*. Three of them, the Berlin, Hamburg and Bremen States, are called “*Stadtstaaten*”, and the remaining thirteen are called “*Flächenländer*”

¹² “Concerted Action in Healthcare”: committee devoted to healthcare coordination

¹³ Commission for Ethical Issues

Furthermore, there are other institutions built with specific purposes, including the “*Kassenärztliche Vereinigungen*”, the Associations of Statutory Health Insurance Physicians, whose tasks are related to the management of contracts and insurance of doctors and nurses.

1.2.3 – Financing and Spending of the German Healthcare System

In 2021, the total healthcare expenditure amounted to 474 billion Euro, corresponding to the 13.2% of GDP, according to data provided and published by Destatis, the Federal Statistical Office of Germany. The following graph suggests that the German healthcare system is mainly financed through public contribution, coming from statutory health programs.

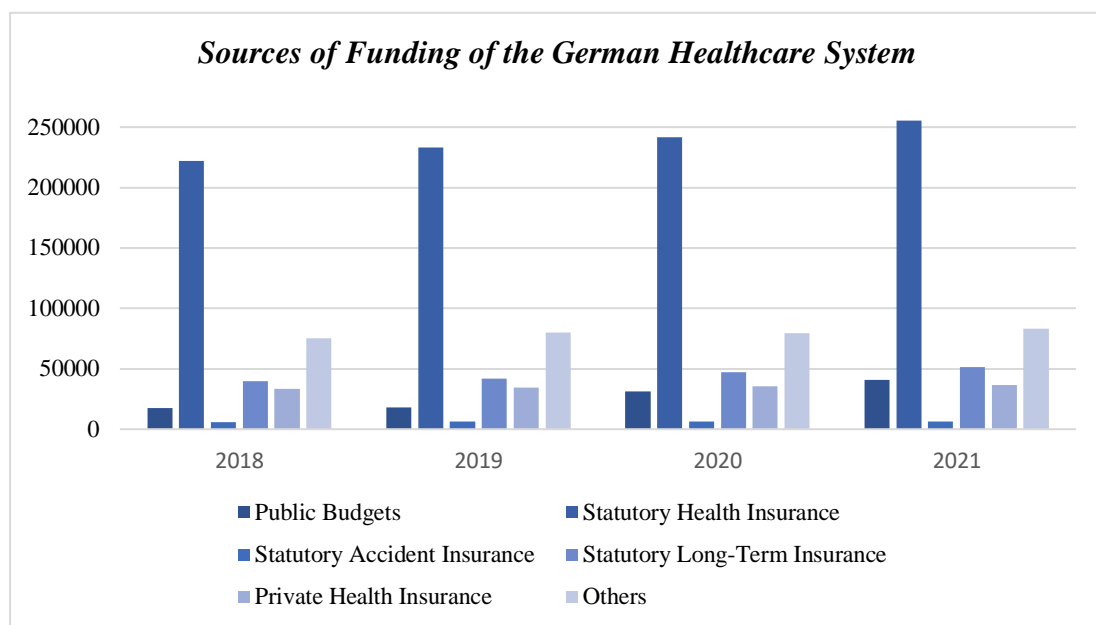


Figure 5: Sources of Funding of the German Healthcare System, expressed in millions of Euro
Source: *Destatis*, German Federal Statistical Office

Private insurance, on the other hand, represents only a small portion of the total (8%), and has remained constant since 2018. The underlying reasons are embedded in the efficiency of the system itself and the requirements that a private citizen must fulfil in order to gain access – yearly income has to exceed the established threshold of 62,550 Euro.

Moreover, it must be said that, once a citizen decides to enter into a private insurance scheme, it is difficult for him or her to return to statutory programs: not only he must not exceed 55 years of age, but also to have an income inferior than the threshold. Thus, the decision must be taken carefully, since private premiums tend to increase proportionally with the age of the insured. These requirements and these implications explain why, in Germany, Private Health Insurance (*PHI*) is not predominant.

Private Health Insurance, moreover, is heavily regulated by the Government, in order to avoid that the insured would face excessive rise in his or her premium following age increases, or to avoid being burdened by excessive premiums.

The system of Statutory Health Insurance (*SHI*), consistently over time, has represented around the 57% of total financing. Moreover, total public financing amounted, in the period considered, to

around 74% of the total, and is made of (i) *Public Budgets*, (ii) *Statutory Health Insurance*, (iii) *Statutory Accident Insurance*, (iv) *Statutory Long-Term Insurance* and, included within the category of “Others”, (v) *Statutory Pension Insurance (SPI)*.

This represents the result of the action of the Government that, between 2009 and 2011, introduced a uniform rate of participation for retired, employer and employees, corresponding to the 7.3% of their gross salaries. Moreover, citizens may be requested, upon detailed examination of personal finances, to pay an additional premium that, in 2022, amounted, on average, to the 1.3% of their gross income. These contributions cover directly the payer and, indirectly, their respective families, including spouses who are not income-earners and eventual sons or daughters. The *SHI Program* provides coverage also for certain services which are not strictly linked to its competences, including treatments for children, which are financed alongside with a federal program.

As introduced at the beginning of this paragraph, health expenditure, in Germany, amounts to 13.2% of GDP, representing the highest-spending country in Europe, both in absolute terms and with respect to country’s gross domestic products.

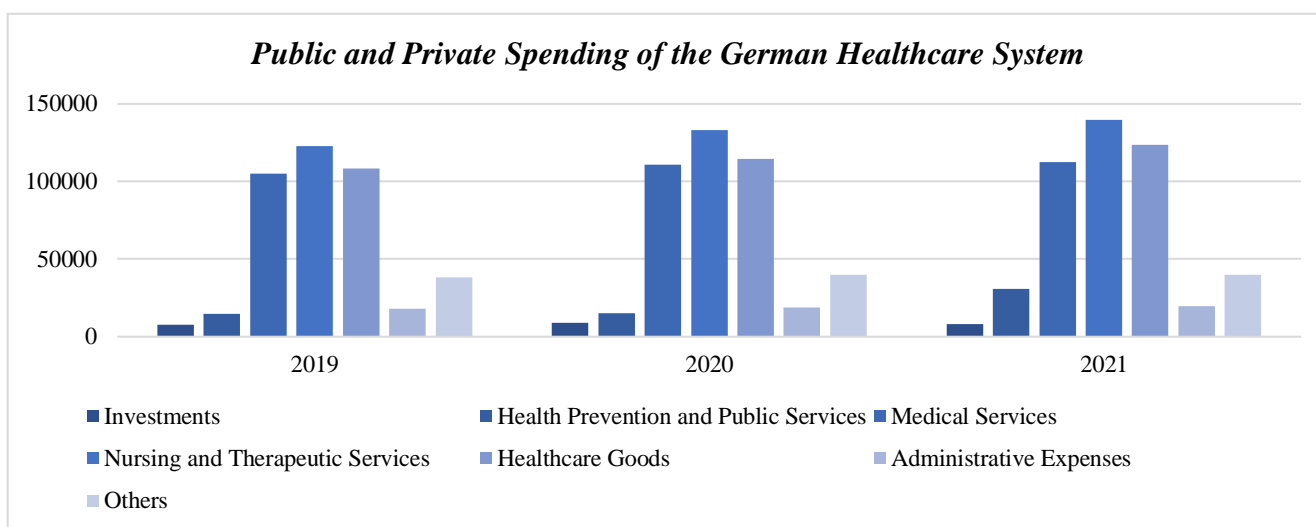


Figure 6: Public and Private Spending of German Healthcare System, expressed in millions of Euro
Source: *Destatis*, German Federal Statistical Office

Investments, despite being the smallest category, are still considered extremely important. They include everything ranging from purchases of innovative machinery to research and development. Länder and Federal Government are eager to continue to innovate and strengthen the system, predicting a significant surge in the demand for medical services following the incumbent problem of the aging of the society and certain specific features of the German population, among which a significant rate of obesity and the excessive, albeit declining, smoking rate.

Almost the entirety of spending is devoted for the different types of services that the system offers: (i) *prevention and public services*, that include screening or health protection programs, (ii) *medical services*, ranging from diagnostic to laboratory or special medical treatments, (iii) *nursing and therapeutic services*, in which it is possible to find all types of maternity services, and (iv) *healthcare goods*, that involve the purchases of goods used for all the above-mentioned offered performances. Moreover, it is worth noticing that, within the category of “medical services”, there are also all the types of treatments that are not included in either *Statutory* or *Private Health Insurance*, such as the payments for plastic surgery.

1.2.4 – Provision of Medical Assistance in the German Healthcare System

German citizens are allowed to choose between three different *health insurance schemes*, financed, in the same proportion (7.3%), by employers and employees: (i) *Statutory Healthcare* (in German: GKV), (ii) the *Unfallversicherung*, the German insurance against working accidents and (iii) the *insurance for long-term assistance*, the long-term care.

General and specialist practitioners that offer clinical services, are often paid by the GKV, and as such must be enrolled within regional associations, that are responsible for stipulating contracts with health insurance funds. In particular, the *Kassenärztliche Vereinigungen* are devoted to the management and the coordination of physicians, acting like intermediaries between insurance funds and doctors themselves.

The physicians salaried by Statutory Health Funds typically offer treatments in private structures, either on their own (around 60%), or with the cooperation of other professionals.

Contrarily to the Italian system, in which a formal prescription from the “*medico di base*” is needed to access higher-care performances, in Germany, there is no need for prescription under SHI, implying that General Practitioners are completely exempted from the role of Gatekeeper.

However, this feature, typical of the Bismarck Model, is rapidly disappearing, because of the 2004 Reform, aimed at reducing pressure on medical infrastructures and strengthening local care.

Practically, this implied encouraging citizens to refer to a general practitioner, that, apart from becoming a “*gatekeeper*”, would also become responsible for the coordination of future services for the citizen in analysis. In this way, the reform attempted at stimulating the institution of multi-specialist clinics (and it managed to reach this result) and facilitating treatments for chronic illnesses. This reform, however, has not created all the expected outcomes. The total number of general practitioners, due to their increased importance should have been rising ever since, but this was not the case: only the 46% of German publicly-accredited doctors is a General Practitioner, that are forced to deal with heavy workloads. The case of general practitioners will be dealt with in more detail in the following chapters, when dealing with the impact of Covid-19 on health workforce.

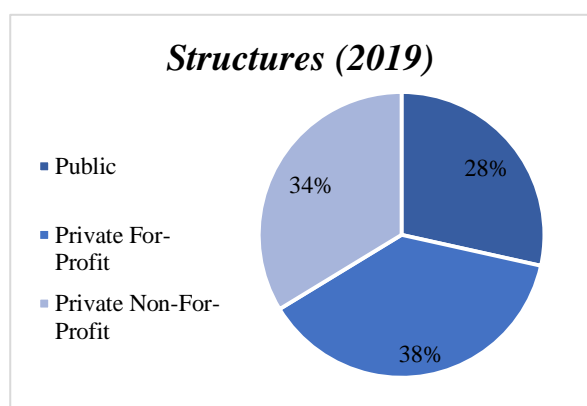


Figure 7: Number of Structures in the German Healthcare System
Source: OCPI, “*Come Funziona il Sistema Sanitario Tedesco?*”

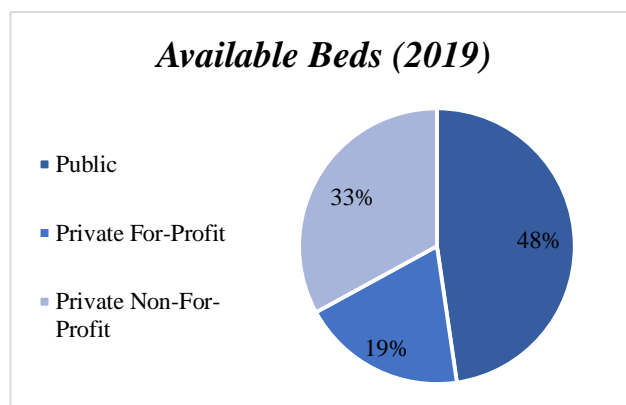


Figure 8: Number of Structures and Available Beds in the German Healthcare System
Source: OCPI, “*Come Funziona il Sistema Sanitario Tedesco?*” (2021)

Hospital services are offered through 1914 structures, mostly private (around 72%), either for-profit or non-for-profit. However, despite representing only the 28% of the entirety of medical structures, almost half of the total available beds belong to public structures. In line with the majority of

developed countries, the number of available beds has progressively decreased since 1990s, because of the development of new technologies, greater prevention and more efficient care. Nevertheless, the total of beds per 1000 citizens is still the highest among European Countries. These structures are complemented by out-patient clinics, rehabilitation structures and, from 2004, multi-specialist clinics.

1.3 – The Private Health Insurance Model and the American Healthcare System

The “*Private Health Insurance Model*” is grounded on the principle of voluntary and individualistic choices. In countries in which there is no government-run healthcare system, and, as such, no universal coverage guaranteed by the State, citizens are forced to find remedy within the private market, governed by price-based mechanisms. The inclination of residents of these countries to seek insurance coverage, if not already provided by alternative sources, can be attributed to their risk-averse nature. These markets, including the American Private Healthcare Market, are often characterized by insufficient coverage, that stems from the limited competition against different insurance providers.

In the United States, the *Government Accountability Office* (GAO) published a report in November 2022, concluding that enrollment in private health insurance plans is “significantly concentrated” (United States Government Accountability Office, 2022), in reference to the *individual* (insurance plans directly sold to individuals), *small groups* (insurance plans offered by small employers) and *large groups market* (insurance plans offered by large employers). The straightforward consequence stemming from the lack of competition is a considerable number of uninsured citizens.

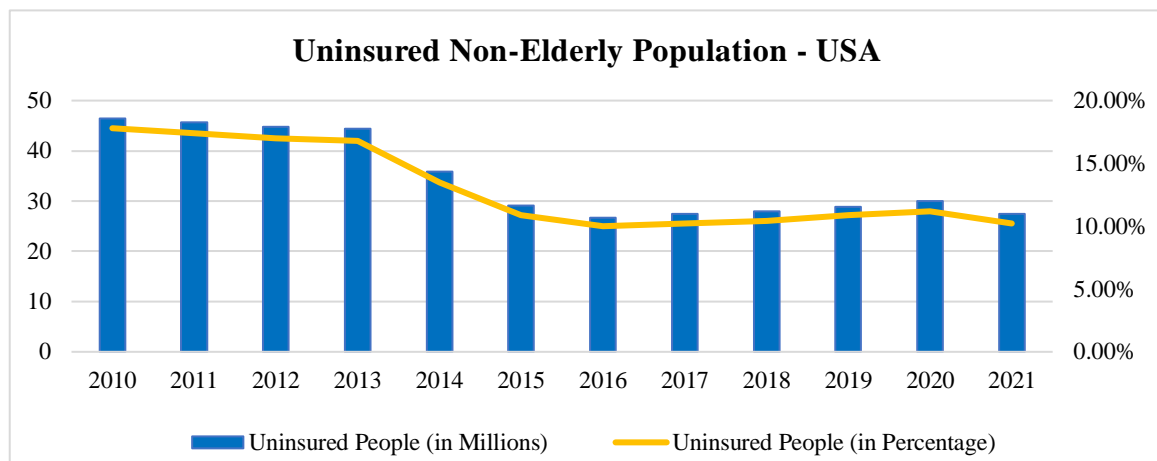


Figure 9: Uninsured Non-Elderly American Population, in millions of citizens and in population percentage
Sources: KFF, “*Key Facts about the Uninsured Population*”; NCHS, “*Health Insurance Coverage*”

Being based on the principles of voluntary and individualistic choices, adherence to this model implies that any citizen has to pay, personally, for his or her medical treatments. The annual or monthly payment, the premium, is calculated including factors like the type of the insurance plan, the coverage it offers and the health risks and health history of the individual, and, in case of employees has to be paid by the employer as a side-benefit to the salary.

Theoretically, those who are not financially able to afford to pay, or those who decide, on their own, not to sign for an insurance program, would have to pay for eventual needed medical treatments through the *Out-of-Pocket Model*.

Practically, however, since the majority of uninsured citizens are either poor families or people with disabilities, National Authorities step-in and provide social programs aimed at helping individuals and families in difficulties.

In the United States, in particular, the Government provides, for different social classes, different aid programs, including, but not limited to the Medicare, the Medicaid and the Children's Health Insurance Program.

Medical entities, made of professionals and sanitary structures, usually joint under the name of associations, deal strategic contracts with insurance companies and the payments they receive are on a "*fee-for-service*" (*FFS*) basis.

This payment method, according to several scholars is the root of several distinguished inefficiencies, not only it does raise costs for patients, but also creates a mechanism such that doctors focus more on delivering as many services as possible, rather than focusing on providing high-quality treatments.

This problem could be solved by stipulating contracts implying "*performance-based*" payments, stimulating greater care for the quality, rather than the quantity.

The United States, in particular, represent the exception among Western economies. They continue implementing a system in which a private mechanism based on competition among for-profit providers is still predominant.

Because of its nature and its structure, moreover, US Healthcare Spending is among the highest in the world, amounting to \$4255 billion of US Dollars, corresponding to 18.3% of GDP.

1.3.1 – Historical Background of the American Healthcare System

The description of the historical background of the American healthcare system is conducted following the outline delineated in the publication of Bradford Kirmann-Liff, entitled "Healthcare reforms: Learning from international experience" and published in 1997.

He illustrated, in "*eight acts*", the main adjustments and reforms that authorities have implemented over time, and that have concurred to build the actual healthcare system of the United States; these acts, because of their progressive nature, are also known as "incremental reforms".

Between the late 19th and the beginning of the 20th century, in Europe, as seen in the previous paragraphs, there was a significant shift towards universal medical coverage, with all the main developed countries that started to follow the early examples of Germany and United Kingdom.

In USA, however, the situation was completely different: people and politicians pushing for a national welfare state, among which figured also Franklin D. Roosevelt, future US President, represented only the minority of the population. This phase, known as "*first act*", was, then, characterized by severe hostility towards those who pushed for a universal healthcare system.

The "*second act*" started with the Great Depression of 1929. During these years, ranging from 1929 to the early 1930s, the situation in USA was characterized by severe social tensions, due to the strong impact of the crisis on the economic structure of the country, triggering unemployment rate to 25% of the total population. In this period, former President Roosevelt, enacted the so-called "*Social*

Security Act”, often referred to as “New Deal”, the first attempt of its administration towards general universal healthcare protection.

Moreover, they also attempted at building a national health insurance program, but their attempts immediately failed, due to the strong pressure exerted by the *American Medical Association (AMA)*, that identified, in this new model, a serious threat for their own profits. The pressure exerted by private institutions on the attempts of healthcare refunding of public authorities will be a recurring theme, in the sense that all the developments were mainly obtained due to the virtue of national institutions, such as the Congress or the President, directly.

The end of the Second World War, and the severe increase in inflation coincides with the beginning of the “*third act*”. Roosevelt’s Administration was forced, in this sense, to freeze the salaries of workers, in the attempt of controlling the rising inflation. Because of that, workers, otherwise not willing to work, started being offered side benefits to their salaries, which, in most cases, consisted of health insurance. This mechanism, still in use nowadays, allowed employers to detract these medical expenses from their tax payments and, at the same time, employees could avoid paying taxes on it.

The “*fourth act*” coincides with former President Truman’s attempt of establishing a national health insurance scheme. However, similarly to what happened in the “second act”, also this attempt resulted in a complete failure, because of the pressure of sector-specific interest group, that did not share the same idea of US former President, as they would have received no economic benefits.

The “*fifth act*” consists in the implementation of the two famous programs of Medicare and Medicaid. This period ranges from Eisenhower’s presidency to Johnson’s, with the latter contributing to the formal implementation of policies introduced by the former.

In particular, it all started in 1960 (under Eisenhower’s period), when the US Congress approved the “Medical Assistance Act”, that allowed for the possibility of federal financing towards the US States that guaranteed medical assistance to the elderly and the disabled. This policy, under the name of *Medicare*, entered into force in 1965, when the President was Lyndon B. Johnson. His administration also managed to approve the “*Medicaid*”, a social policy aimed at providing health coverage to the poorest segment of the population.

At this point, the US Healthcare system was, in practice, divided between public and private insurance schemes, with the former being Medicare and Medicaid, and the latter being the *Employer-Employee Mechanism* and the *Self-Employed Mechanism*.

During 1970s, under the guide of Richard Nixon, and in order to face the severe increase in medical costs, that were raising the burden, for the Federal Government, related to Medicare and Medicaid, in USA were established experimental systems of medical assistance.

These systems were grounded on the leading figure of non-for-profit insurance providers, centered on “*Health Maintenance Organizations*” (*HMO*), capable of controlling medical expenditure. This is what is known as the “*sixth act*”

HMOs were not able to completely supervise the problem of the rising costs, and this led to the “*seventh act*”: the crisis of the compensation system based on the indemnity plan.

Businesses were burdened with extremely severe costs, and it started to be unprofitable for them to offer side benefits to the salaries of employees. This represented a serious threat for private insurance companies, that, in order not to lose the streams of profits, decided to change their composition. From this moment, they converted themselves into “*Managed Care Organizations*” (MCO), keeping the initial status of private and for-profit companies.

The last, and “*eighth act*”, coincides with the attempts of former President Bill Clinton to introduce even more comprehensive social policies aimed at bringing the American healthcare system closer to European models. The main goal of its reform, known as “*Hillary Care*”, consisted in obliging insurance companies to not to deny coverage to citizens with pre-existing severe medical conditions and making health benefits mandatory as side benefits to the salaries of any job. However, once again because of sector-specific pressure, his attempt failed.

1.3.2 – *The American Health System Structure*

The American health system is based on the coexistence of different health insurance schemes, to which citizens can freely decide whether to apply or not. Broadly speaking, these programs can be divided in three main categories, ranging from individually-purchased or employer-provided to state-financed programs. These programs, according to their structure, help the insured in facing medical expenses, either partially or completely. According to a research published in 2021 by the United States Census Bureau, the total amount of the uninsured amounted to the 8.3% of the total population, that correspond to 27.2 million citizens, not-evenly distributed among different age groups.

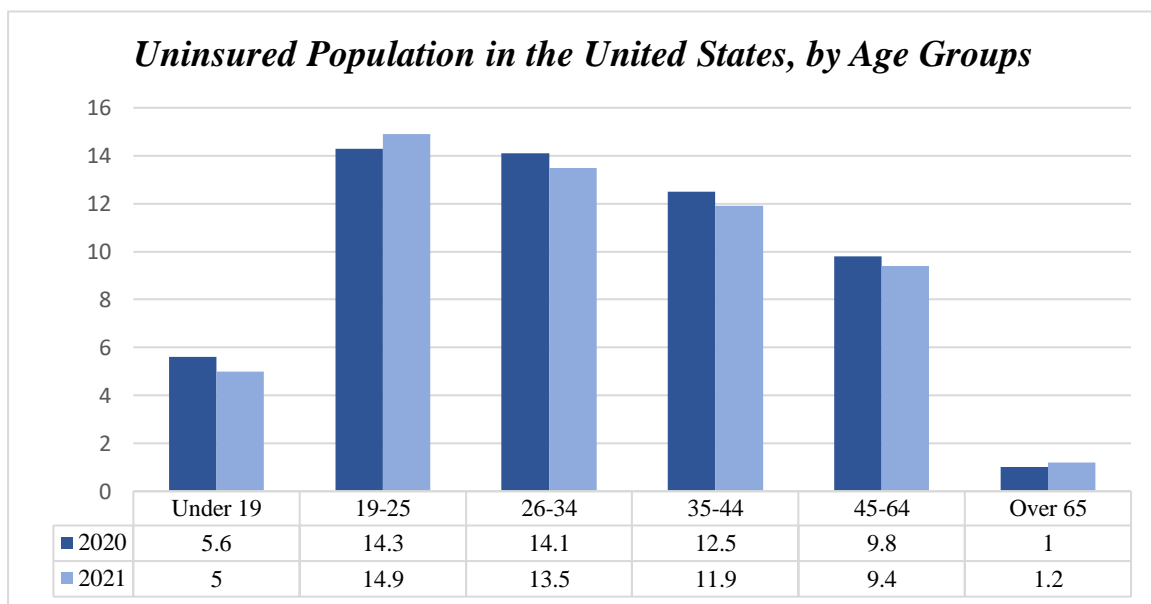


Figure 10: *Uninsured Population in the United States, by Age Groups, in millions*
 Source: US Census Bureau, “*Health Insurance Coverage in United States: 2021*”

Insured citizens, on the other hand, represent the majority of the population. They have, at their disposal, several plans among which they are free to choose. Insurance plans are not mutually exclusive, in the sense that a citizen can be covered by more than one type of health insurance during his or her lifetime.

Population coverage by Insurance Type

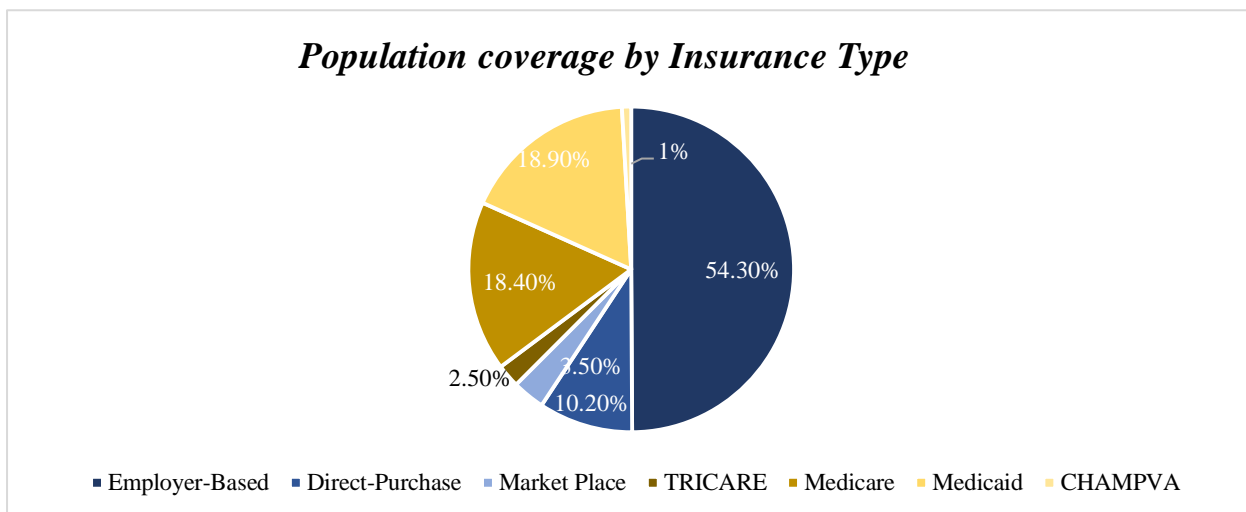


Figure 11: Percentage of Insured Population covered by different type of healthcare insurance
Source: US Census Bureau, “Health Insurance Coverage in United States: 2021”

From this graph, it is possible to gather a crucial insight about the American healthcare system: despite being regarded as a private system, and, at least on principle, it is, an increasing percentage of citizens is being covered by publicly-provided programs. In particular, in figure 11, these programs are: TRICARE, Medicare, Medicaid, and CHAMPVA. In 2021, more than one third of the total US population was covered by public schemes, and this number is likely to increase in the near future: the growing awareness of the evident limitations of private insurance and the rising interest toward the existing challenges of quality, access, affordability and equity that the latter has often failed to address, triggered the boom of public healthcare programs.

Furthermore, this trend is evident in the unfolding of various initiatives implemented by the Federal Government, including the expansion of Medicare and Medicaid, and, the implementation of the “*Affordable Care Act*” (ACA).

The attempts made reflect the belief that public healthcare can be pivotal in the improvement of sanitary outcomes, specifically for the segments of the populations which remain often unserved or, at least, marginalized.

This brief introduction aims at providing a crucial insight about the American healthcare system: it is a complex network composed of several providers, multiple sources of financing and a complex interplay of federal, state and local regulations, mainly devoted to the supervision of the private insurance market. In the next two paragraphs the discussion will be centered, respectively, on the private insurance market, and its components, and on public insurance programs, with a detailed description of the main programs and the criteria for eligibility.

1.3.3 – Private Insurance Schemes

The private health insurance market in the United States is a dynamic system that, despite the rise in adherence to public programs, particularly since the election of former US President Barack Obama, still plays a crucial role in the American healthcare system.

Generally speaking, American private insurance schemes are designed to cover the insured from a wide range of risks: not only health-associated risks, but also risks associated to emergencies or costs stemming from drug prescription.

Contrarily to public insurance schemes, private schemes strongly differ as they are drafted upon a number of “personal” variables, such as the age, the current health status and the health history of the citizen seeking the insurance.

Private insurance companies often have networks of healthcare providers and facilities with which they have negotiated discounted fees, in view of providing efficient and immediate services as well as keeping prices low.

The quality and the cost of services, in particular, represent the reason why, in USA, private insurance markets are severely regulated, through a mix of federal and state policies. Indeed, the need of protecting consumers, ensuring, at the same time, a fair degree of competition among different insurance providers and elevated standards in terms of availability and quality of medical services, have always been crucial issues for American institutions.

In their view, indeed, avoiding an excessive rise of premiums and avoiding that insurance providers engage in practices that harm consumers are key elements for the stability of the healthcare system as a whole.

As said before, the regulation of private insurance market is a matter regulated both at the federal and at the state level.

At the federal level, the launch of the “*Affordable Care Act*” (*ACA*), by the Obama administration in 2010, introduced significant regulatory changes in these markets: insurance providers started to be forced to cover individuals with pre-existing conditions, to provide, in any case, essential health services and limit the amount of *OOP* Expenses to be paid by patients.

This, in a sense, explain the existing difference between Federal and State regulations: the former are more centered on national problems, while the latter retain powers in assessing state-specific issues. For instance, state regulations establish the type of coverage that must be offered, maximum amounts of premiums to be charged and policies for renewals or cancellations.

Broadly speaking, the world of private health insurance markets in the US can be divided into two macro-categories: “*employer-sponsored plans*” and the so-called “*non-group*”, including all the individually-purchased plans.

According to the data published by the “*Kaiser Family Foundation*” (*KFF*), for 2021, 54.1% (corresponding to 176 million people) of the American population were enrolled in private healthcare plans. In particular, 156 million people (48.5%) adhered to employer-sponsored plans, and the remaining 19 million (6.1%) directly purchased their insurance plans.

Employer-sponsored contract, as said, represent the vast majority of existing private insurance plans, but, before diving into its working mechanism, some clarifications needs to be made.

Firstly, it must be clearly understood that the employer does not cover, in the majority of circumstances, the whole premium: in single-plans¹⁴, employers pay, on average, an amount corresponding to the 80%, whereas, in family-plans, a slightly lower share, corresponding to the 70% (on average).

¹⁴ Single-plans: insurance plans that cover only the employee, and not its dependents

Secondly, the contribution of employers for healthcare insurance plans is not mandatory for all the US enterprises: as established by the Affordable Care Act, businesses that employ less than fifty workers are not obliged, to offer insurance plans as a side benefit to salaries. However, ACA also maintain that they can freely decide to offer specific insurances. When premiums are not partially covered, the straightforward consequence is a rise in salaries that, however, as researches have shown, is not preferred to being covered by insurance, due to the general risk aversion of the population.

Lastly, in connection with the first aspect mentioned about employer-sponsored insurance, it must be specified that there is no specific rule about the share of premiums that firms have to cover. Generally speaking, however, the larger the enterprise, the greater is the contribution of the employer. Even though, according to these three features of employer-sponsored plans, the system seems to have its own balance, there are some significant drawbacks to be considered.

The first one is related to a specific feature of the American labour market: its dynamism. In US, more than in Europe, the labour market is extremely dynamic: workers, of any type, often face either the problem or the opportunity, according to the circumstance, of changing their occupation. When this happens, the latter find themselves in a situation in which they may be obliged to give up this type of benefits, exposing themselves to serious risks.

The most worrying fact is a consequence stemming from the fact that, as any other private and competitive market, the private insurance market is composed of profit-driven businesses. For this reason, since the beginning of the twenty-first century, premiums have risen significantly, ending up almost doubled if compared to the above-mentioned period. This rise, however, has not been coupled with an approximately equal rise in either wages or inflation. The direct implication is that, whenever possible, an increasing number of private enterprises, not belonging to the healthcare providers or to the healthcare insurers sectors, is deciding not to offer insurance-plans. Thus, while this trend is undoubtedly and frighteningly negative, it is coupled by another tendency: the rise in privately-purchased insurance plans.

The so-called “non-group”, including all the citizens enrolled in private insurance plans, but that decide to voluntarily and privately pay for their own medical insurance, is made of 19 million of citizens, corresponding to the 6% of the total population.

In these programs, citizens cannot split the payment burden with either relatives or employees and, upon decision by the Federal government, these payments are only partially deductible.

Contrarily to employer-sponsored plans, privately-purchased plans, in few cases are eligible for tax deductions, probably, in an attempt of reducing its incidence on US population.

In terms of coverage and services offered, they are extremely similar to previously-mentioned employer-purchased plans, but people often incur in the possibility of facing severe constraints, ranging from increased and more frequent out-of-pocket expenses to higher co-payments.

The individual insurance market has undergone significant transformations since the entry into force of the well-known “*Obamacare*”, in 2014.

Indeed, specifically with the enactment of the *Patient Protection* and of the *Affordable Care Act*, insurance providers were prohibited from denying insurance coverage to those with existing medical conditions. Prior to this reform, indeed, individuals with pre-existing severe medical issues, were required to undergo a series of medical scanning treatments, and, whenever accepted for insurance,

premiums were significantly higher than average, making extremely difficult for them to seek affordable coverage.

The Federal reform encompassed not only the prohibition of denying insurance access to those whose premiums would be extremely high due to previous diseases, but also the implementation of price-ceiling regulations. This measure sought to ensure that individuals could dispose of insurance plans without having to incur into unreasonable financial burdens.

The response of private insurers to the Obamacare is evident in the rise of the so-called “*Managed Care*”, that are “health insurance plans intended to reduce unnecessary health care costs through a variety of mechanisms” (National Library of Medicine, 1990). In other words, *Managed Care* represent a specific set of medical activities aimed at controlling the rise in the cost of medical coverage provision, through the offer of practices that limit the choice of insured citizens in terms of available physicians and the restriction in the amount of fees charged by the physicians themselves. These practices, then, are designed exclusively with the idea of reducing unnecessary healthcare costs by means of various mechanisms, including, but not limited to, financial incentives for patients, that take the form of reduction of premiums, and physicians.

The growth of *Managed Care Organizations (MCOs)*¹⁵ is evident in the sense that, in all their different structures, have become the most common choice in terms of health insurance programs in the private sector. Generally speaking, there are different typologies of MCOs plans among which citizens can choose, including: (i) *Health Maintenance Organizations (HMOs)*, (ii) *Preferred Provider Organizations (PPOs)*, (iii) *Point of Service (POS) plans* and (iv) *Exclusive Provider Organizations (EPOs)*.

Health Maintenance Organizations are structured insurance plans that provide medical coverage exclusively through a network of partnered structures and physicians. Their non-profit nature, coupled with a reduction in the available choices for individuals, allow HMOs to offer medical coverage in exchange for a lower annual or monthly premium if compared to standard private insurance agencies. Moreover, this fact also allows to reduce significantly the total amount of co-payments, that are limited, economically speaking, to US\$20. Lastly, participants are also exempted from paying any kind of deductible.

The reduction in premiums is achieved also through the fact that medical entities partnered with HMOs are paid an agreed-upon fee and, as such, they are not paid according to the services erogated. This agreement enables to raise further concerns about the quality of healthcare provision, rather than its quantity: physicians and structures would be concerned more about the perceived level of the services.

Overall, their non-profit nature, that prioritizes the provision of medical care, the emphasis posed on the issue of prevention activities, the agreed-upon fees basis rather than the fee-for-service basis and the promotion of efficient cooperation among different levels of healthcare system, in view of promoting and prioritizing basic assistance, are the distinguishing elements of HMOs with respect to standard private insurance providers.

¹⁵ Entities that provide healthcare services and insurance coverage to their subscribers by contracting with healthcare providers (physicians and physical structures)

Preferred Provider Organization plans, on the other hand, target a different segment of the population. People that decide to subscribe to a similar program, in exchange for a significantly higher premium, the payment of an annual deductible and the participation in co-payments (not limited to US\$20), enjoy fewer regulations in terms of physicians and medical treatments.

In particular, PPOs subscribers are not required to have prescriptions or authorization of any type in order to access high-level care (i.e. hospitalization or clinical surveillance). However, they cannot use non-partnered facilities and doctors.

Despite the significant increase in premiums, the possible payments of deductibles and the possible participation in co-payments, PPOs plans are extremely appealing for American citizens, in particular for their increased flexibility and freedom.

Point of Services plans are an extremely flexible type of managed care insurance, offering to its clients the flexibility to choose between two distinct offers. The first type of offer allows clients to contact doctors or hospitals partnered with the organization, upon prescription from their Primary Care Physician, but no preventive authorization from the insurance company. This practice is often called “*in-network service*”. On the other hand, the second type of offer is known as “*out-of-network service*” and allows its subscribers, in exchange for higher deductibles and co-payments, to be free to choose which doctor or medical facility to choose. Moreover, contrarily to the first type of offer, services are accessible without a prescription from the Primary Care Physician. The increased possibility for freedom and flexibility, however, comes at higher costs.

In a sense, they are collocated in between the strict HMO plans and the flexible PPO plans. Indeed, even though it offers more flexibility, albeit with higher costs, than the previously-mentioned HMO plans, it still has some restrictions, particularly in terms of “*in-network services*”.

Exclusive Provider Organization plans are a type of managed care insurance that, in a sense, limits its coverage to healthcare providers within a specific network, without having to refer to the Primary Care Physician to see specialists. Their little flexibility and the fact that, when the insured seek care outside the restricted network, he or she has to bear the full cost of the treatments, are the reasons why their premiums are among the lowest offered by private insurance plans.

In the last decades, the rise of PPOs plans, the significant growth in administrative and marketing expenses, are pushing insurance providers towards the establishment of a new category of plans: the *High-Deductible Health Plans (HDHP)*. In recent years, they have become increasingly popular because of their low monthly premium and, particularly, for their tax-advantaged Health Saving Account (HSA) options. Their working mechanism is, in a sense, complex: subscribers have to pay high deductible before insurance plans intervene, resulting in higher out-of-pocket expenses, but, in the long-run, the possibility of referring to HSA options allows to save on healthcare costs, and what is saved can be later used for qualified and tax-free medical expenses. Broadly speaking, these services are often chosen by those families that, feeling healthy, do not anticipate significant healthcare expenses in the future.

1.3.4 – Public Insurance Schemes

The most important drawback of a private healthcare system comes from the fact that equality is not guaranteed: in other words, not all citizens are equal in terms of coverage and access. This is when publicly-funded insurance programs step in.

Indeed, they are designed to offer and provide affordable healthcare services to individuals and families that, for various reasons, are not able to purchase private plans.

There are different programs, each with its own specificities and its own targets, primarily funded at the federal level and administered at the state level. The general legal framework, including topics such as criteria for eligibility, is, instead, established by the Federal government.

Their impact, since the introduction in the second half of the twentieth century, on the American healthcare system has undoubtedly been significant, but, after having undergone a series of updates, improvements and extensions, there are still scholars that question their efficacy and cost-effectiveness.

Medicare is one of the most famous publicly-provided insurance programs. Its enactment, in 1965, through the “*Social Security Amendments*”, under the administration of President Lyndon B. Johnson, aimed at reducing social inequalities for specific segments of the population: elderly and people with disabilities. Prior to the introduction of Medicare, in 1965, the share of elderly (i.e. people aged 65 or more) that owned an insurance plan amounted only to 54% - in other words, in case of need of medical treatments almost half of the oldest portion of the population had to incur into out-of-pocket expenses. However, they were not able, in most of the circumstances, to afford these payments, and this contributed to a strong rise in inequalities between different age groups.

For this reason, Medicare targets elderly and people with disabilities. The program is co-financed by two different sources: (i) general taxation and (ii) compulsory contributes paid by businesses and employees.

Originally, despite the strong opposition towards this type of socialized healthcare of the *American Medical Association*, it was divided into two distinct parts: the first, compulsory, was apt at covering hospital assistance and home care, while the second aimed at covering medical assistance and rehabilitation for patients, and was designed to be supplementary and voluntary. The first extension took place in 1997, when a third part was added, centered about the optional coverage and assistance managed by Managed Care Organizations. In 2006, the introduction of a fourth part marked, for the moment, the end of Medicare extensions: the coverage for pharmaceutical products.

The program, however, is heavily regulated and, as such, is characterized by several limitations.

Part one, in particular, reduces the access to physicians and facilities to those who have signed an agreement with Medicare institutions. Moreover, it also claims that the program partially covers the costs of hospital assistance. Indeed, before the sixtieth day of hospitalization, the citizen has to pay a fixed cost, different, but reduced, for the following thirty days and the full cost after the ninetieth day. This idea of cost-sharing responds to the first principle of the act itself: the principle of *hospital assistance*. The remaining three principles are (i) the *skilled nursing facility assistance*, (ii) the *house assistance* and (iii) the *hospice assistance*. Generally speaking, these principles establish all the services that a citizen, declared eligible for Medicare, disposes. Moreover, it also establishes the framework of the cost-sharing measures.

The second part that, as said before, can be exploited by anyone enrolled in Medicare on a voluntary basis, lists a series of additional services provided by the program. Similarly to the regulations concerning the first part, these treatments are always co-financed, partially by the individual, partially by the Federal government.

The third part, related to the first extension of 1997, consists of the regulations for the *Managed Care Organization* chosen by the individual itself. Even though the services offered remain equal to those offered in the first part, the entrustment of an MCO allows the possibility of a cost reduction and a pharmaceutical products coverage.

The fourth and last part, to which an individual is enabled to subscribe to only after having subscribed to the first and the second, establishes co-payment rules for prescribed pharmaceutical products.

Medicaid, established alongside Medicare in 1965, was initially thought as a sort of natural extension of the latter, covering the social classes not included within the criteria established by the Federal government to be declared eligible for Medicare. Indeed, while Medicare centers its attentions on the elderly and people with serious disabilities, Medicaid provides coverage to a range of vulnerable social classes, including: (i) disabled individuals, (ii) blind people, (iii) minors, (iv) single mothers, (v) AIDS sufferers and (vi) the portion of elderly not covered by Medicare.

It must be clearly understood that Medicaid, within its range of assistance activities, devotes its resources only to the above-mentioned categories, not to the whole subset of population with low income. Moreover, Medicaid makes further distinctions within these categories according to specific criteria: the *Federal Poverty Line (FPL)*, established at US\$21,200 on a yearly basis.

Minors, for example, in order to be declared eligible for Medicaid coverage, must have a yearly family income below the threshold set at 200% of the FPL – in other words, if their parents' income is below US\$42,400 they are declared eligible. For other categories, thresholds are below: 185% of the FPL for single mothers or pregnant women, for employed parents with children the limit is 68% of the FPL while for unemployed parents with children the limit is 41%, lastly, for elderly and disabled people it is at 74%.

Assistance activities are not limited to offering health coverage for these classes, indeed, Medicaid played a crucial role in offering urgent assistance during extraordinary situations, including the 9/11 terrorist attack or the Katrina hurricane. Moreover, it is also the largest source of financing for *Community Health Centers*, public clinics and *Skilled Nursing Facilities* that provide care to those in need. These activities, for the largest part, are managed by *Managed Care Organizations*.

Services provided by Medicare have to be divided between the ones approved directly by the US Federal Congress, and, therefore, compulsory, and services coming from state-oriented decisions that, in the majority of circumstances, are optional.

Its management sees powers being divided, once again, between Federal and State Congresses, with the former retaining most of the powers in terms of general deliberations and financing, and the latter being in charge of the remaining financing and the establishment of more detailed criteria for eligibility. This design was built on the idea of allowing Medicare, that covers more heterogeneous segments of the population with respect to Medicaid, to being more adaptable to state-specific issues. Indeed, among the roles covered by Medicare, US States are able to address specific economic issues, including threshold limits in terms of eligibility and co-payments eventualities.

1.3.5 – Financing and Spending of the American Healthcare System

Healthcare financing and spending, in the United States, is a complex issue because of the features of the system itself: the coordination between public and private sector is reflected also in this context. In particular, the two main sources of financing of the American healthcare system are the tax levy,

that represent public funds, and the private spending, including the payments of insurance premiums, which directly help to finance the system. In particular, as the following graph suggests, public sources of financing (the ones in blue) represent almost half of the total financing, divided between Federal taxes (35%) and State and Local taxes (11% in total).

Sources of Financing

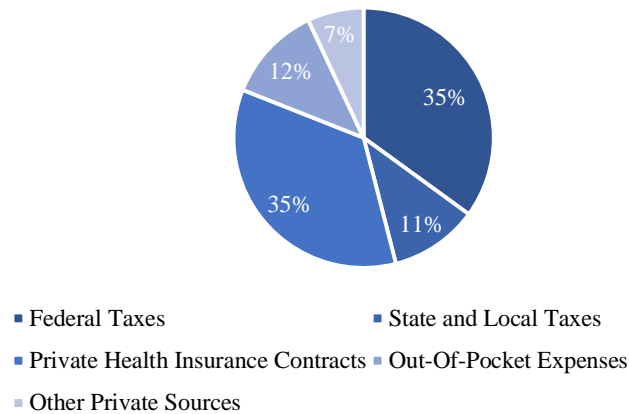


Figure 12: Different sources of Financing of US Healthcare System

In terms of the private side of financing, private health insurance contracts represent the vast majority (35%), followed by out-of-pocket expenses (12%) and, lastly, other private sources, including donations and crowdfunding (7% in total).

Another worth-mentioning funding source comes from the *Federal Insurance Contribution Act*, better known as “*FICA Tax*”. It is a payroll taxes, used to finance the federal expenditure on publicly-provided programs such as Medicare. This type of tax is imposed on both employers and employees, in an equal share: each category bears 1.45% of tax rate, for a total of 2.9%. Moreover, in the case in which the employee earns an amount higher than US \$200,000, it is imposed an additional tax burden of 0.9%, often referred to as “*Medicare Tax*”. Broadly speaking, the FICA Tax represents approximately 40% of the total revenues of Federal taxation. Federal taxation is made also of Excise Taxes, Personal Income and Corporate Income Tax. State financing, on the other hand, is made of different types of taxes, ranging from general sales taxes to excise or property taxes, and intergovernmental transfers – transfers that see funds moving from the Federal government to States’ government, to finance all sort of public programs. Local contribution, lastly, comes from property taxes, utility charges and eventual additional excise taxes.

Private Financing, as said, represents the other side of US healthcare funding and, among OECD Countries, USA is the country that is financed more by private sources, due to the structure of the system itself. The effective sources of financing are payments of insurance premiums, either through employer-sponsored or individually-purchased programs, and out-of-pocket payments, including co-participated payments, deductibles, pharmaceuticals and non-covered treatments.

Among OECD Countries, USA, alongside with Mexico, is the country that derives the majority of its healthcare funding from private sources.

Similarly to what happens in the case of financing, also American healthcare spending has to be divided between private and public, with the former mainly consisting of direct spending on insurance

premiums and additional out-of-pocket expenses and the latter constituted by spending on public programs such as Medicare and Medicaid and administrative expenses.

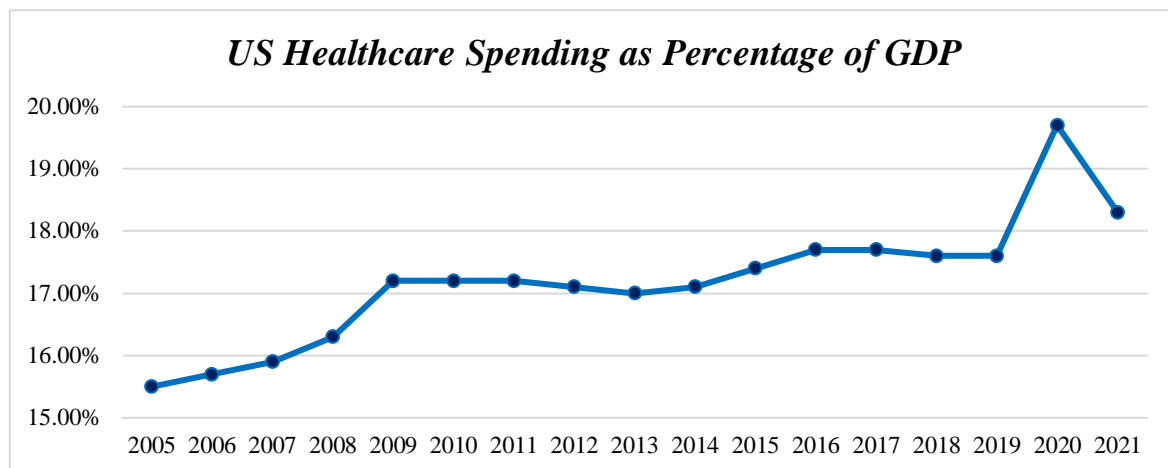


Figure 13: US Healthcare Spending as a Percentage of GDP
Source: "US national health expenditure as percent of GDP between 1960 and 2021", Statista

In the United States, similarly to the majority of the rest of the developed Countries in the World, has been constantly rising since the beginning of the twenty-first century. Roots of this rise have to be found in economic, such as the increase in private premiums, and demographic trends, such as the aging population. This data is extremely interesting if looked at from an absolute perspective: the total amount of expenditure was US\$4.3 trillion, corresponding to US\$12,914 per capita, one of the highest in modern world.

Moreover, it is important to specify how the growth in health spending (that can be seen in Figure 13) has completely outpaced the growth in GDP, even though the two have been realigning since the beginning of the century.

These resources are mainly used for the provision of (i) Hospital Care (approximately 31%), (ii) Physician and Clinical Services (20%) and (iii) Retail Prescription Drugs (approximately 9%). The remaining 40% of services provided are devoted to: (i) Residential and Personal Care Services (5%), (ii) Nursing Care Facilities (4%), (iii) Dental Services (4%), (iv) Home Health Care (3%), and additional specialist services and medical equipment purchases.

Chapter 2: COVID-19 Pandemic & Policy Responses

Covid-19 has been an unprecedented global health emergency that has severely affected the whole World, causing an enormous amount of deaths and disruptions in the social, economic and political framework of several Countries.

Before being formally declared a “global pandemic” by the World Health Organization on March 11th, 2020, it started in Wuhan, in the Hubei Province of China, with the first cases being registered in December 2019.

This situation has required Governments to adopt strict measures in order to contain the spread of the disease, among which social restrictions, such as lockdown or social-distancing measures, have had a severe negative impact on the population and on the economy of most countries.

This chapter serves as an introduction for the following chapters that will provide a more in-depth analysis of specific implications of the pandemic impact on the healthcare systems described in Chapter 1.

Indeed, in view of understanding precisely all the details related to the consequences of Covid-19, it is necessary to properly examine the impact and the social and economic policy responses of the Governments.

The need of this chapter derives from the fact that, alike their respective healthcare systems, Italy, Germany and USA have profound and significant differences in their political structure. Moreover, the inherent differences in terms of population composition and economic backgrounds created different country-specific challenges that governments were required to address.

Moreover, the different nature of their healthcare systems and of their provision of medical assistance makes interesting to understand which of them appeared to be better prepared and which managed to respond better to the unforeseen circumstances.

However, before analyzing country-specific responses it is necessary to introduce some data about the magnitude of the pandemic on these countries. Adopting a global perspective, as of January 19th, 2023, the total number of confirmed positivities to Covid-19 amounted to 672,348,884 people, according to data of the *World Health Organization*.

Specifically, Italy, in the period between December 2019 and December 2022, has reported a total of over 6 million cases, with more than 140,000 deaths, as confirmed by the Italian *Ministry of Health* and the *WHO*. The peninsula was one of the first countries that, upon a Government decision, decided to adopt the so-called “Lockdown Measures”, forcing its citizens to stay at home for almost three months, unless leaving home for exceptional reasons.

Germany, on the other hand, despite the larger population, managed to keep, within the same period, the confirmed cases slightly above 4 million people, with a significantly less amount of deaths, that amounted to 105,000, as confirmed by the *WHO*, the *Destatis* and the German *Ministry of Health*. Lastly, USA experienced significantly higher numbers, with above 90 million confirmed cases and

more than 1.9 million deaths, as published by the *WHO*, the *Kaiser Family Foundation* and the *CMS*¹⁶.

In the recent article published by “The Lancet”, entitled “WHO’s Pandemic Treaty: promises of equity should be kept”, it is claimed that “The Global Response to Covid-19 was a failure (...). Nations once thought of as well prepared for the pandemics (...) have suffered hundreds of thousands of excess deaths” (The Lancet Global Health, 2023).

Moreover, an OECD Publication entitled “*Healthcare Financing in times of high inflation*” highlighted how the institutional response to the pandemic, signalled by the 1% increase (with respect to GDP) in health spending, on average across OECD Countries, between 2020 and 2021, still proved not to be enough. Indeed, the unexpectedness and the strength of the virus’ impact forced authorities to prefer investing in quantity rather than quality.

This chapter will be divided into three main paragraphs, with each of them devoted to the understanding of the impact and the responses to the pandemic in a Country, following the same order of the previous chapter: Italy, Germany and USA.

The first part of each paragraph will discuss, in depth, the impact of Covid-19 on the country under analysis, providing a comprehensive assessment of the challenges faced, in the pandemic period, by healthcare systems, including strains on healthcare infrastructures, shortages of medical personnel and supplies and the significant increase in the demand with the parallel reduction in supply of healthcare services.

The description, then, proceeds by examining the measures implemented by national authorities in response to the pandemic, with a specific focus on reforms and investments aimed at strengthening the healthcare system. This will include direct public investments, aimed at expanding the capacity of the available infrastructures, and public initiatives, including the recruitment of additional graduated healthcare workers and volunteers.

2.1 – Challenges created by the Pandemic in Italy

In Europe, Italy has been, throughout the whole course of the pandemic, one of the most severely hit countries, not only in terms of deaths and contagion, but also in terms of strains for healthcare workers and shortages of medical supplies.

The extremely rapid surge in Covid-19 cases, spread from Lombardy to all the other Italian Regions with an extremely dramatic pace, has immediately brought the concern of institutions towards the ability of *intensive care units (ICUs)* to provide ad-hoc care to severely ill patients.

Indeed, since the outbreak of the emergency, the Italian healthcare infrastructure has been completely overwhelmed: shortages of medical resources of any kind, from *personal protective equipment (PPE)* to *ICU beds* and ventilators and shortages of trained professional compounded by the worsening in socio-economic conditions at the country level, affected the ability of the system to adequately

¹⁶ Data about Covid-19, confirmed cases and deaths refers to the period December 2019 – December 2022 also for Germany and USA

respond to these challenges, to provide timely and efficient medical attention to the whole population, not only to Covid-19 patients.

However, as next chapters will demonstrate, treatments, surgeries and scanning activities that required urgent care managed to function properly despite the recurrent shocks caused by the pandemic.

The problems, indeed, have been mainly related to non-time-constrained situations, which are likely to represent a serious menace for the future

Data on Italy perfectly highlights all the strains faced by the system: rapid increase in hospitalizations, surge in mortality, shortages of medical supplies and medical personnel.

The outbreak of the Pandemic in Italy has created and worsened a situation that, also in the period before Covid, seemed to be unsustainable. Indeed, the ability of the Italian SSN to provide punctual universal coverage had already been challenged by a prolonged period of mismanagement and insufficient resources.

The first and, probably, the most significant problem is related to the absence or, at least, the scarcity of healthcare workers of different categories, stretching from Doctors to Nurses. This has been a recurring and underrated issue that authorities have continuously failed to address. Indeed, according to the report published by *FNOPI*¹⁷, between 2009 and 2019, the employed personnel of the Italian SSN has strongly fallen, as the next graph suggests:

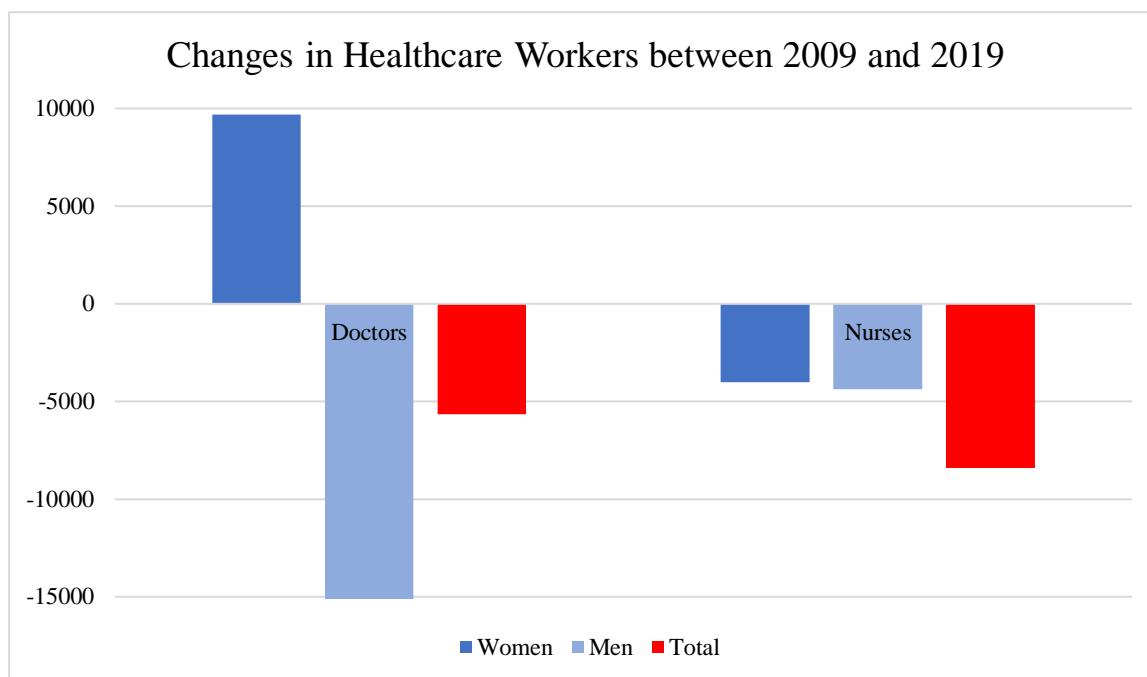


Figure 14: Changes in Healthcare Workers in Italy between 2009 and 2019
Source: FNOPI, *“Stato della Carenza Infermieristica al 2021”*

Healthcare workers have been forced to be in the frontline in the battle against the virus, as they were required to carry out an extreme effort because of the increased workload, prolonged working

¹⁷ FNOPI: Federazione Nazionale Ordini Professioni Infermieristiche

hours and the extreme risk of being infected, jeopardizing their own physical and mental health. Despite this dramatic scenario, the peak of the pandemic, reached multiple times between March 2020 and the end of 2022, that created strains in healthcare facilities' capacity and led to the shortage of needed medical supplies, left doctors and nurses alone in facing extreme decisions regarding patients' prioritization and resource allocation.

In the end, an unacceptable number of these “silent heroes” lost his or her life in service, either because of the complications occurred following the contagion, or because of external, but still related, issues, ranging from psychological drawbacks to extreme physical stress.

The following graphs provides a precise analysis of contagions in the healthcare workers' sector, during the pandemic period:

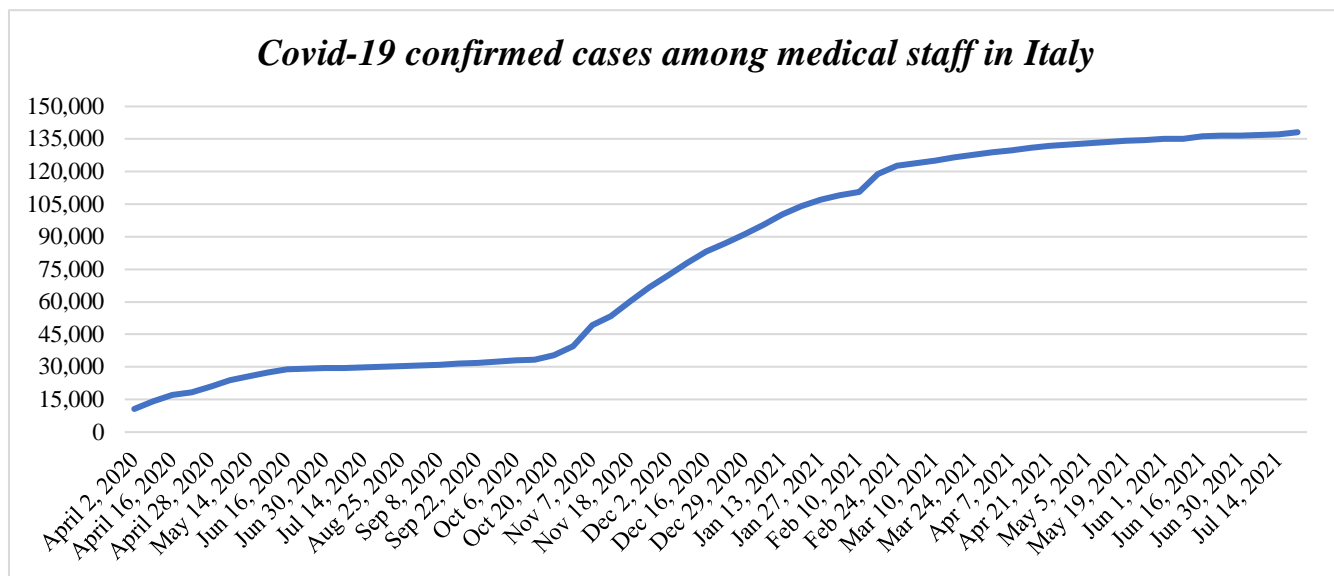


Figure 15: Cumulative Covid-19 confirmed cases among medical staff in Italy in the period April 2020 – July 2021
Source: [Statista.com](https://www.statista.com)

Moreover, as of September 2022, the estimates made by FNOPI suggest that the reported and confirmed cases have risen above the 320.000 units, only referring to nurses.

Dramatic estimates also come from deaths: since the outbreak of the pandemic, more than 1000 people, among nurses and doctors, have lost their lives.

However, shortages in healthcare labor force is only one side of the medal, as the other side is represented by shortages in medical supplies. The inherent inability of the system to channel existing resources efficiently and the lack of a forward-looking approach by authorities, that have continuously failed to devote sufficient levels of investment toward the sector itself, created the necessary conditions for a complete implosion of the sector.

Alike already-analyzed problems, insufficient medical resources have often been a debated topic, with healthcare workers repeatedly reporting lack of personal protecting equipment, ICU-related tools and essential medicines.

Thus, the inability to address these supply chain problems, despite being thought as of primary importance, in practice never received the required amount of attentions, until when, with the outbreak of the pandemic, the rapid surge in demand posed additional challenges to address.

Fortunately, since March 2020, through the combined use of National and European Funds, institutions engaged in investments aimed at promoting the production of needed equipment and supplies and improving manufacturing processes. In this specific regard, the most delicate problem is the one related to the availability of Intensive Care Units (ICU) beds. Throughout the course of the pandemic, indeed, the scarcity of ICU beds forced healthcare workers to make several extreme decisions, as mentioned earlier. Before the pandemic, the number of available ICU beds amounted to slightly more than 5.000 units and they were distributed disproportionately across Italian regions, forcing an increased, though positive, cooperation of doctors of geographically distant regions. The resilience of the system, in this sense, has been extremely challenged, and, for this reason, authorities, despite the period, successfully managed to expand national capacity, building, as the following graph suggests, more than 3.500 additional ICU beds, reaching the target of 14 beds per 100.000 citizens.

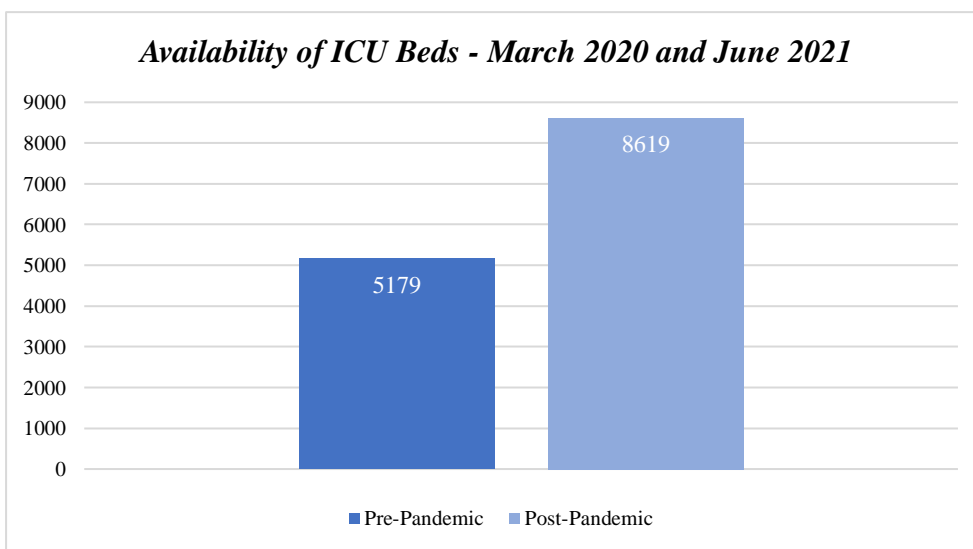


Figure 16: Available Number of ICU Beds – March 2020 & June 2021
Source: [Statista.com](https://www.statista.com)

It must be specified, however, that the enlargement of capacity occurred in some regions more than others, as institutions decided to devote more investments towards more populated and more affected areas. Indeed, northern regions, such as Piedmont, Lombardy and Veneto saw their ICU beds capacity being extended by more than 50% with respect to pre-pandemic level (respectively by 500, 438 and 331 units). The extension of the capacity of ICU beds has proved to be crucial in periods of prolonged pandemic peak, with rapid surge in Covid-19 contagions.

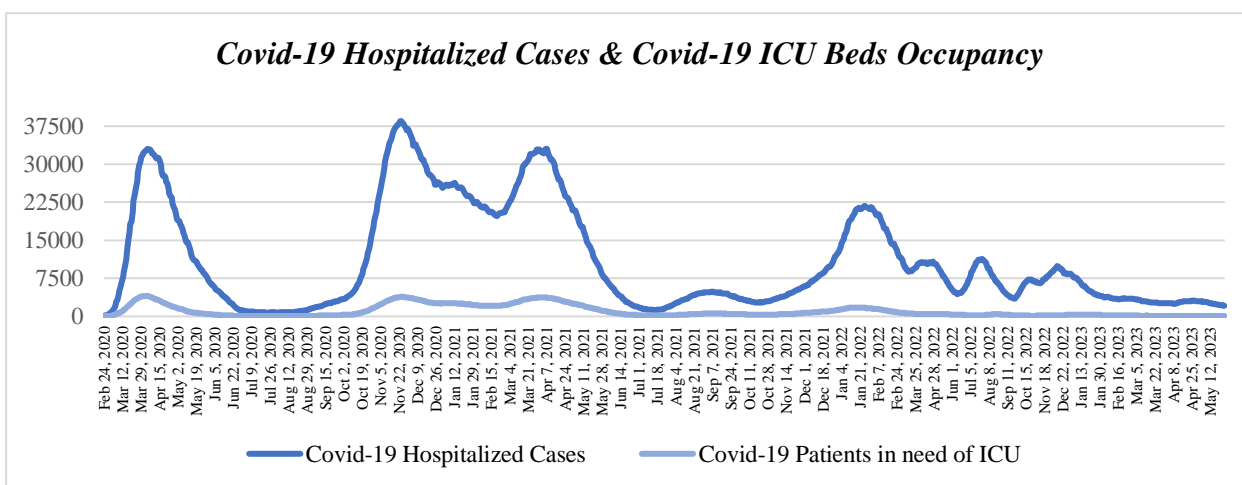


Figure 17: Covid-19 Hospitalized cases and ICU beds occupancy – February 2020 to May 2023
Source: [Statista.com](https://www.statista.com)

However, the shortage of medical staff has been considered only as the second main problem faced by the Italian SSN. Indeed, according to a survey carried out by *IPSOS*¹⁸ in 2021, it was claimed that the main concern related to the healthcare system was related to the prolonged waiting times and to access to healthcare treatments and facilities (IPSOS, 2021).

In this regard, the paper entitled “Indirect impact of Covid-19 on hospital care pathways in Italy”, published by *Springer Nature* in 2021, provides important insights. It analyzes seven regions (namely Piedmont, Lombardy, Emilia Romagna, Latium, Tuscany, Apulia and Sicily) and focuses on three different clinical areas: cardiology, orthopaedics and oncology. The paper, through a dynamic approach, compares data from 2018-2019 with pre-lockdown (January 2020 to March 8th 2020), post-lockdown (from May 18th 2020 onwards) and during-lockdown insights (from March 9th to May 17th 2020).

Results shows little differences among regions, but significant disparities across and within the three analyzed clinical areas, in particular:

Cardiology: despite a severe reduction (40%) in hospitalizations, the proportion of urgent surgery had not showed significant reduction from previous years during the lockdown period

Orthopaedics: the clinical area in which the situation remained more stable, but the limited mobility of the population has undoubtedly contributed to lowering the demand for specific surgeries

Oncology: the observations suggested significant differences in the volumes of reductions in surgeries according to a specific criterium: surgery type. In particular, surgeries for lung cancer showed a limited, though significant, reduction (approximately 20%), while there have been greater declines in breast and prostate cancer surgeries (ranging from 30% to 40%)

The paper also shows that, despite the different pandemic impact and the different sanitary background, general trends did not show remarkable differences across regions. This conclusion seems to be supported by the fact that, in the analyzed areas, despite the decrease in hospitalizations (in 2020 *Agenas* registered a total of 6.5 million of hospitalizations, -22% if compared to the average of the years 2017-2019), the system managed to respond timely and efficiently to situations that could not be postponed. However, the forced delays for non-urgent treatments contributed to increasing the pace of the shift toward private care and to overwhelm the public SSN in the current period, despite the significant fall in the pandemic burden.

2.1.1 – Institutional and Private Response to the Covid-19 Crisis in Italy

The Italian Government had to face an unexpected and unprecedented crisis: the spread of the virus and the already-dramatic situation of the healthcare infrastructure forced institutions to engage in extreme measures, that, at least in containing contagions proved to be extremely effective.

Former Italian Prime Minister Giuseppe Conte, on March 11th 2020, two days after the introduction of severe restrictions for all Italian regions, announced the decision to enter into a period of lockdown: any commercial activity, made exceptions for those providing basic and primary needs, was forced to close and citizens were obliged to “*stay at home*”. This included the closure of public and private schools and universities of any degree, the prohibition of leaving home unless an exceptional need occurred, and public gatherings.

¹⁸ IPSOS: Institut Public de Sondage d’Opinion Secteur

Italy was the first Occidental Country to impose, on its citizens, these extreme measures. The aim of authorities was to curb the transmission of the virus, that seemed unstoppable and to prevent an excessive burden on healthcare systems.

The forward-looking approach of the Italian government proved to be highly effective, as, following a stabilization period, the data on contagion improved drastically. For this reason, other countries followed the “*Italian Model*”, implementing these severe but strongly needed measures.

However, the lockdown measure had also its drawbacks: as non-essential businesses were temporarily obliged to shut down, particularly small and medium enterprises entered into a period of significant economic strains.

In view of avoiding the collapse of the Italian economic environment, the Government, helped by the decision taken by the ECB on March 20th to suspend the Stability and Growth Pact, decided to enact “*Cura Italia*” on April 24th (even though proposed in mid-March). This “*decreto legge*” amounted to 25 billion Euro, and consisted in a set of measures to reduce the economic burden on firms and individuals, including: (i) the expansion of the flexibility of temporary layoff schemes for businesses, (ii) the prohibition of dismissals based on “justified objective reasons”, (iii) the provision allowing workers to request parental leave, (iv) the enlargement of 800 euros for the month of April to SMEs in difficulties and (v) the temporary suspensions of mortgage payments, upon the attainment of certain conditions.

On April 7th, there was the second round of economic interventions, known as “*Decreto Liquidità*”, whose aim was to directly provide liquidity and support to the SMEs hit by the economic emergency. The instrument implemented was the public guarantee on loans, ranging from 70% to 100% of the total amount (with the total guarantee exclusively for loans not exceeding 25.000 euros). The main access channel was the “*Fondo di Garanzia per Piccole e Medie Imprese*”. Furthermore, the decree provided for the suspension of payments for companies in debt to the tax authorities and the extension of the so-called “Golden Power” to prevent national companies from falling into foreign hands. However, these measures were subsequently criticized by businesses.

Starting from May 2020, after having overcome the peak of the pandemic crisis, the Government announced gradual re-opening measures, ranging from non-essential economic activities to personal movements.

Moreover, the urgent need to strengthen the healthcare infrastructure, imposed an additional source of concern for authorities. In particular, the Government undertook substantial investments to address this challenge, encompassing the construction of new facilities, the so-called “*Field Hospitals*” (i.e. “*Ospedali da Campo*”), and improvements of existing ones.

The Italian *Esercito*, with the cooperation of *Marina Militare*, engaged in the construction of field facilities, that played a crucial role in expanding the capacity of the SSN in the war against the virus. The structures built in Crema, Piacenza and Jesi perfectly express the meaning of the decision made by authorities: setting up temporary facilities in strategic locations, providing additional beds and equipment for patients requiring ICU beds. Investing in building these facilities allowed a more efficient allocation of resources and improved patient care. However, despite proving out to be extremely efficient in the short-term, the issue related to shortages of medical equipment has still not been sorted out.

Moreover, the recruitment and extensive training of additional healthcare personnel has undoubtedly been an extremely useful investment, particularly in a long-term perspective. The straightforward implication of these human investments was the ability of the system to respond to the rapid surge in demand, reducing working hours and workload of already-employed personnel. Furthermore, also the quality of care provided to patients experienced an important improvement: the larger pool of skilled and trained professionals, in conjunction with improved healthcare facilities, enhanced treatments outcomes.

Despite the efforts to recruit and extensively train additional healthcare personnel in Italy, it is imperative to acknowledge that the issue of medical personnel shortages has not been fully resolved yet. While progress has been made, there is still a need for additional investments in order to adequately prepare for future challenges in the healthcare sector. The expansion of the healthcare workforce has undoubtedly shown promise in addressing the existing gaps and increasing the overall capacity of the sector: ongoing investments and sustained efforts are required.

2.2 – Challenges created by the Pandemic in Germany

The impact of Covid-19 on the German Healthcare System can be summarized as an “ordered disorder”. The major disruptions in the economic, social and healthcare backgrounds that characterized the most developed countries worldwide were effectively prevented by a combined action of authorities and the inner features of the German healthcare, financial and political sectors. Germany’s ability to effectively respond to the Covid-19 shocks was helped by the significant time lag with which the pandemic disorder hit the country, as shown by the following graph.

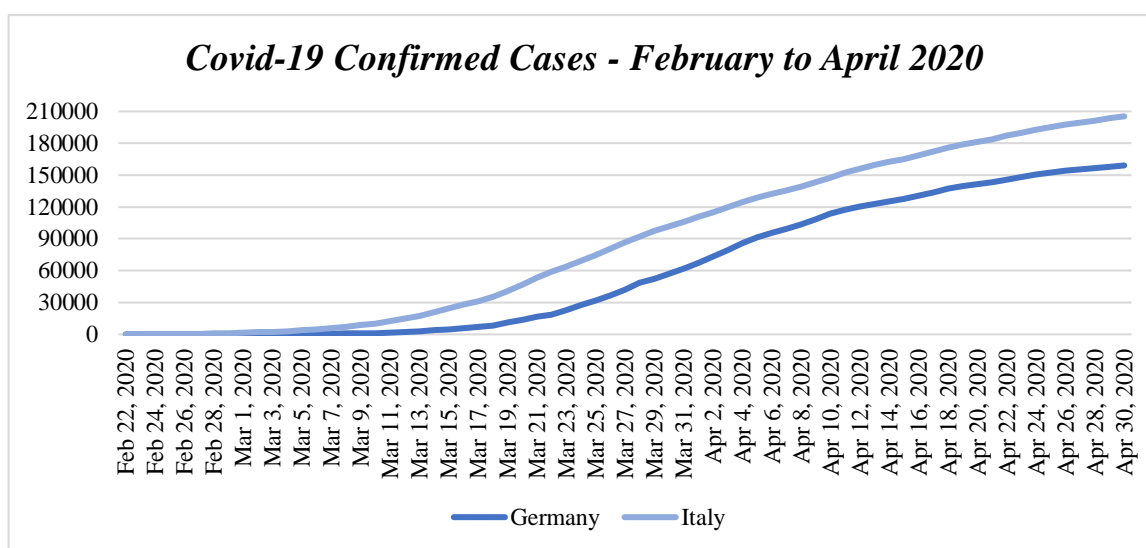


Figure 18: Comparison of Covid-19 confirmed cases between Italy and Germany
Source: [Statista.com](https://www.statista.com)

Thus, the German healthcare system, throughout the course of the pandemic has remarkably shown great ability in dealing with the main waves of contagion. However, the major surge happened since the beginning of October 2020 has highlighted some weaknesses in the structure of its sanitary infrastructure, on which the institutional response has proved to be fallacious, confusing and incomplete.

While problems for Italy came from both shortages of medical supplies and shortages of medical personnel, the main problem for Germany consisted in the relative scarcity of PPEs: Personal Protective Equipment at the disposal of Nurses, Doctors and Medical Workers in general.

The study conducted by J. Cohen and Y. van der Meulen Rodgers, entitled “*Contributing factors to personal protective equipment shortages during the COVID-19 pandemic*”, explores the reason behind these worldwide supply shortages, that affected countries, including Germany, that in the pre-Pandemic period used to be exporters of PPE (Cohen & van der Meulen Rodgers, 2020).

Shortages in medical supplies, according to this research, have to be attributed to two main sources: *government failure* and *market failure*. In particular, the former refers to the mismanagement of central government in terms of acquiring, maintaining and distributing inventories of PPEs, while the latter is related to the “dysfunctional hospital budgeting models”.

Germany, in particular, being one of the largest exporters of PPEs before the pandemic outbreak, alongside developed and developing economies like China and Taiwan, decided to adopt a protectionist policy, consisting in the parallel reduction of exports, that caused global supply chain disruptions (as will be analyzed more in depth in the paragraph on USA Covid-19 challenges), and significant investments in terms of domestic production capacities.

On the other hand, the situation in ICU never suffered extensively from the extreme pressure created by the pandemic. Standing to March 2020 data, published by the *BMG*, the Federal Minister of Health, Germany disposed of 28.000 units of ICU-equipped beds out of the total 497.000 beds available in medical structures. In relative terms, Germany, with 28.2 of ICU beds per 100.000 citizens, has the highest rate among Euro Area Countries and the fourth-highest among OECD Countries.

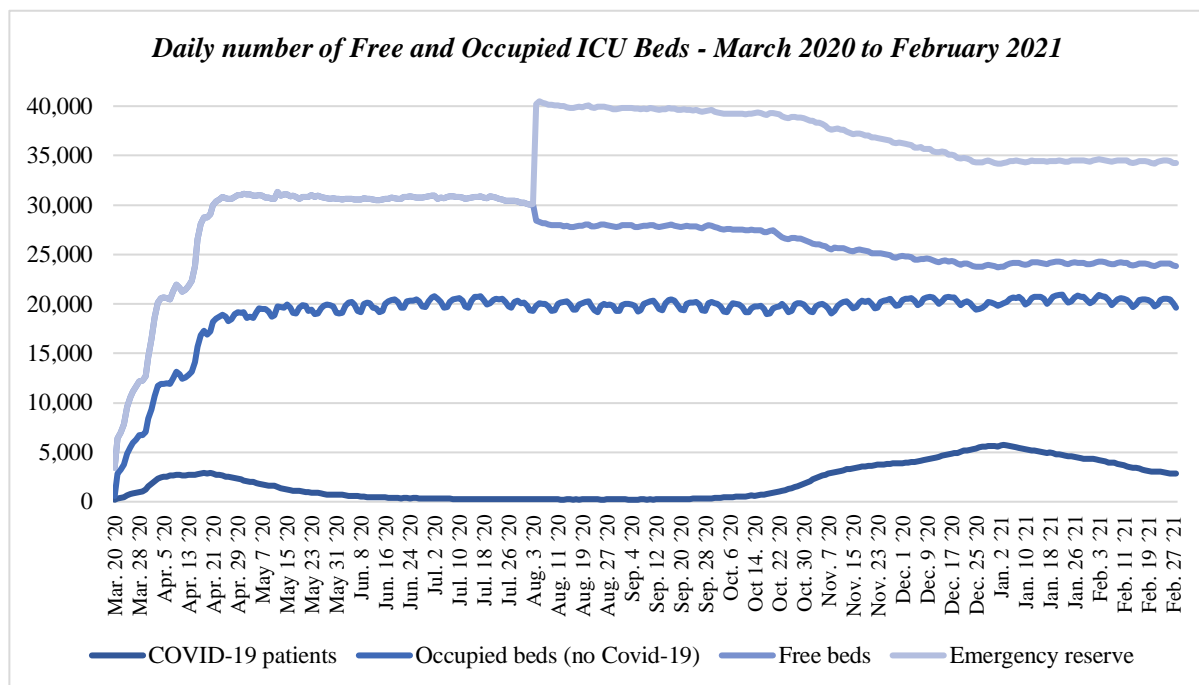


Figure 19: Comparison between free and occupied ICU beds
Source: [Statista.com](https://www.statista.com)

The availability of a greater number of already-existing ICU beds, and the public investments that were announced targeting the construction of additional capacity, were two of the main factors that

contributed to the lower death rate that occurred in Germany with respect to Italy, USA and other alike countries, despite similar data on contagion.

Indeed, the death rate for Germany, obtained as the known deaths over the number of confirmed cases, amounts to 0.55%, while for Italy and USA respectively to 1.01% and 1.23%¹⁹.

Other factors that may have contributed to the significant differences in death rates may be (i) the extensive and efficient screening campaign, (ii) flexible governance because of the federalism nature and (iii) a solid healthcare system as background.

The second point must be observed carefully: the German federalism, in principle, implies a certain degree of autonomy in making ad-hoc decisions (i.e. in the legislative and executive power), that, in turn, creates inherent differences in public campaign management, magnitude and outcomes.

From this, it is possible to understand the meaning of “ordered disorder”: the differences in crisis management among different *Länder*, despite the attempts of the Federal Government, at time led by former Chancellor Angela Merkel, followed by Olaf Scholz, of concentrating extraordinary powers in their hands.

2.2.1 – Institutional and Private Response to the Covid-19 Crisis in Germany

Regardless of the exceptional response of the German healthcare system to the shock created by the Covid-19 impact, the economy, despite its optimal position in the pre-pandemic period, suffered severe, though temporary, strains.

In this specific regard, the Federal Government implemented ad-hoc measures aimed at supporting affected individuals and SMEs, in the form of financial aid programs, rent freezes and employment protection schemes. In particular, the “*Kurzarbeit*” program proved to be extremely useful in preventing excessive workforce layoffs and reducing the economic burden on firms in financial downturn. The initiative was extended to all types of businesses, of any size and coming from any industry, with the only eligibility condition being related to the magnitude of downturn. Employers were entitled to reduce employees’ working hours between 10% and 100% compared to their usual workloads, in order to adapt to the fluctuating demand, while avoiding a significant layoff. Workers, on the other hand, became entitled to a partial compensation of the lost income due to the above-mentioned reduction: they received a percentage of their net wage as compensation for the hours not worked. The program divided workers in three categories: (i) general workers (60% of the lost wage), (ii) workers with children (67%) and (iii) low-wage workers (80%).

In terms of initiatives towards to the healthcare system, the Federal Government approved a series of restrictive measures devoted to the containment of the spread, including Lockdown measures, similar to the ones implemented in Italy, but, in a certain sense, less stringent.

The initial meetings between central and regional institutions did not lead to the expected outcomes, because of divergences in the attitude of *Länder* representatives towards the pandemic. The first restrictions date back to the end of October 2020, with the imposition of the so-called “Lockdown

¹⁹ John Hopkins University, [Coronavirus Resource Center](#)

Soft”, which foresaw the closure of non-essential businesses, made exception for the choice of leaving schools and universities opened to the general public.

The initial delay in contagion, and the experience acquired through the observation of Italian choices, gave enough time to authorities to build an efficient *early tracking process* that resulted in increased capacity and production of diagnostic tests, which turned out to be extremely useful in recognizing the illness in its early stages and prevent it to become, in several situations, a potential danger to the safety of citizens.

The institutions that covered the role of tracking were the approximately 380 “*Gesundheitsämter*”, whose widespread presence throughout the whole territory serves the purpose of collecting data and carrying out contact tracking. They are the equivalent of Italian *Aziende Sanitarie Locali (ASL – Local Health Authorities)*. However, the second wave caught them unprepared, as they were no longer able to catch up with the rapid increase in contagions.

Moreover, additional specific institutional responses and decrees, such as the Infection Protection Act (*Infektionsschutzgesetz*), granted the government powers to enforce restrictions and allocate resources effectively. The latter empowers public and health authorities to take swift actions in order to protect public health and contain the spread of the virus.

Through this act, the Federal Government obtained enough flexibility in implementing lockdown measures. Indeed, lockdown measures were implemented in multiple, but interconnected, phases, adapting to the evolving situation and epidemiological indicators.

The efficiency of the health infrastructure was crucial in providing assistance when needed: the existing standard and ICU beds, and the extension occurred during the pandemic, by means of public investments.

To accommodate the surge in Covid-19 contagion, with the consequent need of additional supplies, the German government invested public resources in expanding hospital capacities. This included setting up temporary field hospitals and increasing the number of intensive care beds. For example, in Berlin, the municipal exhibition center was converted into “*Feldkrankenhäuser*” (Field Hospital) to provide for additional beds. Additional resources were devoted to the establishment of new measures of financial support and incentives for the healthcare workforce. Apart from practices facilitating the deployment and recruitment of retired or inactive workers, additional funds were enlarged to infrastructures in view of covering the extra costs occurred due to staffing, overtime and increased supplies’ prices. Lastly, German authorities devoted significant resources to the provision of funds for research and development activities, including vaccines development efforts and clinical trials.

2.3 – Challenges created by the Pandemic in USA

The United States of America have been severely hit by the spread of Covid-19. Various factors have contributed to the worsening of the consequences on the American healthcare system, including: (i) the attitude of the Federal Government towards the virus itself, that failed to provide sound policy responses and promptly implement measures apt at reducing and limiting pandemic damages, (ii) the nature of the American healthcare system, and the reliance on a private setup that had dampening effects in terms of accessibility and affordability of healthcare services and (iii) the characteristics of

the country, in geographical and social terms: the vastity of the American surface, the inherent differences within population and the extreme emphasis posed by individuals and authorities on individuals' freedoms posed significant obstacles to the creation of responses to the situation.

As introduced in the paragraph on the challenges created by Covid-19 on the Germany healthcare system, the main difficulties for USA should be attributed to the fact that they are one of the largest importers of personal protective equipment and other medical supplies.

In the publication mentioned above, entitled “*Contributing factors to personal protective equipment shortages during the COVID-19 pandemic*”, the authors emphasize that the main factors that have driven these lacks during the most intense phases of the pandemic have been: (i) the budgeting model of American private hospitals, which is a structural weakness of the American healthcare system, (ii) shocks in demand and (iii) shocks in supply for medical equipment and, lastly, (iv) institutional mismanagement and underestimate of the situation.

In particular, authors claim that the fact that private structures in an extremely competitive market, as the market for healthcare treatments in the United States, are profit-driven, preferring quantity over quality in terms of treatments, implies that management boards act in view of minimizing costs, which hampers the quantity of incentives for retaining costly, yet needed equipment inventories.

For these reasons, the budgeting model is extremely dangerous, particularly in times of excess demand, when the provision of an adequate quantity of PPE is essential to the functioning of the whole system. Moreover, the shock in demand essentially triggered a complete change of direction in terms of cost-management strategies, prompting a dramatic surge in panic purchases, hoarding and resales (also by individuals).

By institutional failure, on the other hand, authors refer to the corrective actions that Federal and National Governments could have taken in terms of coordination of domestic production and distribution or in terms of abroad purchases. When the crisis began, authorities refused to use existing tools, such as the *Defense Production Act* that could have obliged domestic producers to engage in the production of needed equipment. Moreover, the Trump administration, in charge during the peak of the crisis, was severely criticized for not having sorted out a problem that had been analyzed and explored in researches since 2006.

Global supply shocks also affected the production of medical equipment: it must be specified that a large portion of the PPE production of USA is produced in other countries, and the excessive reliance on off-shore production hampered a timely and effective response. The main partner, in this regard, of US is China unexpectedly: the incentives for keeping costs low and the low production costs and high-quality products of the Chinese market contributed to making the United States the largest importer of medical equipment. However, the explosion of the pandemic in China in the last months of 2019, created, in the Asian country, a rapid surge in demand, that obliged national authorities to engage in practices that turned out to be extremely harmful for an importer like United States: imposed restrictions on exports and extensive purchases of production factors. Even in this case, despite the spread of the virus affected the North-American country only some months later with respect to China, the failure in prioritizing health needs by the government resulted in severe consequences, at the expense of healthcare workers and citizens.

Another problem for authorities came from the economic sector: employers were forced to shut down or engage in mass layoffs in order to survive to the changing environment. As claimed by the report published by *Families USA*, an association for the protection of consumers, this resulted in 20 million of citizens that lost their work, with the unemployment rate reaching the highest level in the post-war period, at 14.7%.

The problem for citizens was that, in USA, employers often guarantee, as a side-wage, health insurance. Moreover, the fact that, in several circumstances, citizens are covered by health insurance conditional to the employment of one of their relatives, the *Kaiser Family Foundation* estimated that around 27 million of American citizens became uncovered during the pandemic period.

Additional problems came from the fact that, despite the 80% of them are eligible for free public schemes or private insurance guaranteed by the Federal Government, the inability of citizens to provide payments of premiums, whenever required, prevented them from entering into these programs. Moreover, it also emerged a problem of information asymmetry: the cuts in awareness policies and campaigns operated by the Trump administration caused several citizens of being unaware of their eligible status for these schemes.

2.3.1 – Institutional and Private Response to the Covid-19 Crisis in USA

The Trump administration and institutions at the State level, as said, were unable to provide efficient responses in the first phase of virus spread, that triggered a strong rise in USA confirmed cases and deaths, among citizens, and in particular among healthcare workers. However, under the pressure of citizens and associations, several measures began to be implemented.

In response to the shortages of medical supplies, the Government decided to engage in a combined strategic action with the establishment of the *Strategic National Stockpile* (SNS), designed to maintain a mandatory repository of medical supplies, equipment and pharmaceuticals, and the duties of distributing this capacity from the *Federal Emergency Management Agency* (FEMA) to medical structures over the territory. Despite not being able to address the primary waves of Covid-19 contagions, they proved effectively later on, when, with the help of public Vaccine campaigns, authorities prevented an excessive burden from impinging upon the sanitary infrastructure.

Moreover, the Federal Government was forced to implement strict containment measures, including country-wide and state-wide lockdowns, on the basis of the models showed in Europe.

The economic consequences faced by small and medium enterprises in particular, obliged institutions to undertake several measures to alleviate the unsustainable consequences of the pandemic. This took the form of the “*Coronavirus Aid, Relief and Economic Security Act*” (CARES Act), that provided partial remunerations for workers who either lost their jobs or were forced to reduce working hours, and the “*Paycheck Protection Program*”, aimed at preventing excessive layoffs, but the delay in the enactment of the program did not manage to effectively respond to the consequences of the initial decisions taken by firms and employees during the initial waves of the pandemic.

In terms of strengthening and widening the capacity and the reliability of the healthcare system, it was enacted the “*Coronavirus Response and Relief Supplemental Appropriation Act*” (CRRSA Act) and the subsequent *American Rescues Plan Act*. These legislations highlighted the commitment, in later stages of the pandemic, of the Federal Government to support important initiatives, ranging from

the vaccine distribution to the enhancement of healthcare facilities. Moreover, on the track beaten by Germany, the acts provided for the allocation of funds toward *testing efforts*. The lesson learnt during the first phase of the pandemic, with the rapid surge in contagions, and the inability of Federal Agencies to track cases, without managing to prevent additional burden on healthcare structures, brought the attention of authorities toward the establishment of country-wide measurement and track platforms.

2.4 – Considerations

The three different healthcare systems, with different existing problems, and different innate features, adopted different approaches with different outcomes.

Italy, facing severe pre-existing problems, and being the first western country in which major economic, social and sanitary disruptions created by the pandemic occurred, decided to adopt measures for reducing the actual burden on sanitary infrastructure on a short-term horizon. The employment of additional trained personnel, the construction of field hospitals and the lockdown measures contributed significantly to the immediate targets, but the need of structural reforms, as will be analyzed later on, remains an unavoidable concern.

Germany, thanks to the later impact of the crisis and the better initial condition of its sanitary infrastructure, decided to invest in medium- and long-term solutions, not only with the construction of additional standard and ICU beds, that remained available also in the post-pandemic period, but also by digitalizing their outdated healthcare network systems. Major investments and resources were devoted to the production of PPE and the construction of a network of cases and contacts tracking.

USA, because of its greater population and the tardive response of its federal and state authorities, was, among the three analyzed countries, the one more severely hit by the pandemic outbreak. The private nature of its system left massive segments of the population without health insurance and, consequently, without any protection against the virus. Despite being late, the responses focused on the prevention of dampening economic, social and sanitary consequences.

All the three countries managed to invest heavily in public vaccines campaigns, without having to make it mandatory. This choice, despite situations of social tensions between pro- and no-vax, that happened in all the three nations, helped countries to reduce the incidence of contagions on the healthcare infrastructure and the death rates.

Chapter 3: The Impact of the Pandemic on the Healthcare Workforce - Management Implications and Psychological Distress

Healthcare workforce is crucial for the sustainability and development of healthcare systems and, broadly, of population health. However, when dealing with healthcare policy designs, the incidence of the mental and physical burden borne by workers on sanitary outcomes is undoubtedly underestimated.

The Covid-19 crisis, in this regard, acted somehow as a “natural experiment” (Liu, Guo, Zhong, & Gui, 2021), demonstrating, although already known, that “care of the patient requires care for the provider” (Bodenheimer & Sinsky, 2014).

The urge of devoting additional interest and, consequently, resources to the care of individual *HCWs*²⁰ can be understood precisely from a two-fold perspective, whose intuitions are undoubtedly related: firstly, the lacking prioritization of HCWs’ needs during a major global health crisis puts severely at risk their health, and, consequently, the well-being of citizens; secondly, it weakens the possibility for a State of providing *UHS (Universal Health Coverage)*, wherever it is required by national constitutions.

The latest findings in this field, however, demonstrate still the unwanted presence of an unresolved issue; indeed, despite the hardest waves of Covid-19 dating back only three years ago and its consequences still being an unsettled account, all the systems have shown that they tended to prioritize the needs of material resources over human resources. Reasons for this approach can be easily understood with an ongoing pandemic scenario: devoting the required attentions and economic capital towards human resources requires time and, as such, it is a gradual process, while acquiring material resources is more rapid and allows for an efficient short-term solution. However, this is a chronic issue for the majority of systems, as demonstrated by the lacking data on psychological and physical well-being of physicians, nurses and all the other types of workers.

This issue implies that the three models analyzed in this thesis, despite being inherently different in various aspects, often showed similar problems in the pre-Covid-19 scenario, though with different magnitudes and specificities. However, the pandemic, in this regard, has added further problems, interestingly showing that different health systems tend to respond similarly, but, the existing governance gaps concurred to exacerbate inequalities among different categories of workers and among different areas within the same country.

As will be discussed in the chapter, one common solution adopted by all the three jurisdictions when dealing with the severe working conditions of the healthcare workforce is the recruitment of specialized medical personnel (physicians and nurses in particular) from abroad and the request toward retired professionals of resuming active duty, in order to extend the available workforce numbers – this short-term solution, however, has exposed several lives at risk and has not solved any of the existing problems.

In this regard, as said, it is worth mentioning the fact that, despite the importance of the topic, the majority of countries, including but not limited to upper-middle income countries like Italy, Germany and the United States of America, used to devote, in pre-pandemic periods, little interest to the

²⁰ Healthcare Workers

collection of data recording the psychological conditions of their healthcare workers – this to say that it is widespread problem.

Moreover, (Comparing Health Workforce Policy during a Major Global Health Crisis: A Critical Conceptual Debate and International Empirical Investigation) health policies, across countries and over time, failed to adequately address the needs of workers in this field.

This chapter will focus on three aspects related to healthcare workers: the workforce management structure, whose details and features have not been explored and explained yet, the practical institutional responses during the greatest waves of the pandemic and, lastly, the direct consequences of the pandemic on healthcare workers, stretching from heavier workloads and psychological stress and burnout. The structure of the chapter resembles the structure of the previous ones: an initial focus on each of the analyzed countries followed by a comprehensive comparison.

3.1 – Healthcare Workforce Management Systems

In assessing the well-being and the safety of a society, its healthcare system and its financial and intrinsic sustainability are among the first aspects to be analyzed, because of their importance.

The burden of institutions, in this regard, is to guarantee that the system, at large, and its workers, in particular, are “fit for purpose” and “fit for practice” (Vicarelli & Pavolini, 2015). The need for a safe and stable environment has been often underestimated in practical terms, triggering dramatic consequences that physicians, nurses and all the other professionals involved in this sector are forced to face on a daily basis.

As said in the introduction to this chapter, what is more concerning is the greater importance attributed to material resources rather than to human resources when drafting health policies. This repeated choice has created different situations in the countries analyzed: in Italy, the mismanagement of funds and the absence of foresight has created the worst-case scenario, with scarcity and aging of workers and wearing out of equipment; in Germany, the situation is different, but, despite a well-established system of sanitary workforce management and its extremely developed pharmaceutical sector giving pulse to the provision of material resources, there was still the need of recruiting additional personnel, particularly from abroad; lastly, in USA, despite the existing trends of labor mobility, that create an influx of practitioners and nurses from abroad, the nature of the system often triggers increased workloads and unsustainable competition among practitioners, leading to frequent cases of burnout, and the rising demand for treatments, mainly caused by the aging of the population, is creating staff shortages.

However, before entering into in-depth analysis of the existing and pandemic-created unsettled issues, it is necessary to introduce which is the actual structure of national management systems of healthcare workforce, that, in some cases, may result in being the actual root of these problems.

In particular, by healthcare workforce management it is meant the strategic planning, organization and optimization of human resources within the sector. Specifically, this paragraph aims at providing a complete understanding of the actors responsible, in each different jurisdiction, of a number of different tasks, ranging from hiring and recruitment to drafting workload schedules.

3.1.1 – Italian Healthcare Workforce Management System and Problems

The Italian healthcare system, as already discussed in chapter one, is extremely decentralized, with powers being divided on three different levels, stretching from the broadest to the narrowest: national, regional and local. The rationale behind this decision, often questioned due to the existing governance lacks, was to avoid generalized decisions in terms of daily management and performances, giving the opportunity to local authorities to undertake ad-hoc decisions for structures under their responsibility. Indeed, the National Government takes the lead in national healthcare planning, particularly in terms of long-term objectives and the definition of the package of guaranteed health services, as well as in financing and redistributive activities. On the other hand, Regional Authorities, mainly through the “*Dipartimento di Salute*”, are responsible for the drafting and the approval of a three-year *regional health plan* and the bureaucratic activities behind the authorization and the acknowledgement of public and private entities responsible for carrying out of sanitary services. Lastly, at the Local level, *ASLs* are responsible for the management of particular activities, among which the most important regard the organization and practical provision of services. This system is also designed to allow for vertical coordination among different levels. However, the conflict of interests that arise often trigger serious problem of mismanagement.

Hiring and recruitment of specialized personnel, particularly physicians and nurses, happens at the local level, in compliance with directives from higher levels. Indeed, even though hiring procedures and contract drafting are attributed to human resources departments of both private and public healthcare institutions, regional and national authorities are in the position of publishing specific guidelines that local authorities are forced to comply with.

The shortage and aging of personnel, in this regard, comes from the combination of a series of event, both in a national and international perspective. Before understanding the reasons behind these trends, in order to give a detailed context, some data is required.

Indeed, compared to the average of the 28 European Countries, Italy reports a higher number of doctors per 1000 population: 4.1 compared to 3.9, according to 2019 data. The situation is different for what regards nurses: 6.2 compared to 8.4.

These results need to be explored more in depth: the negative gap concerning the number of nurses with respect to the average of European Countries is likely to have increased up to 2023, because of the trend that sees the number of nursing graduates in decline since 2014. On the other hand, despite the results on doctors seem to be encouraging, in reality they hide dramatic insights. Indeed, at the beginning of the pandemic outbreak, in March 2020, the English journal “*The Lancet*” published an article entitled “*Challenges faced by the Italian medical workforce*”, in which the authors reported four main factors that explain why the previous promising results should instead be considered as a wake-up call for regulators. It is claimed that the reason why Italy has managed to keep its results above the European average constantly over time is because it was able to train more professionals than its *SSN* could employ. Moreover, these insights hide the fact that there are severe disparities in terms of available doctors within the peninsula, with the northern regions enjoying a relative higher presence and the central and southern regions dealing with serious shortages (Ricciò, Vezzosi, & Balzarini, 2020).

The other three facts, if combined, explain by themselves the reason why the shortage of workforce should be reckoned as a primary concern in the upcoming future: (i) 54% of Italian physicians are

aged 55 or higher (i.e. 54% of the total amount of doctors), (ii) around 1000 doctors leave Italy on a yearly basis to work abroad and (iii) the relatively limited presence of foreign doctors (Vicarelli & Pavolini, 2015).

For insiders, such as the members of the *FNOMCEO* (*Federazione Nazionale degli Ordini dei Medici Chirurghi e degli Odontoiatri*), the aging of professionals is a well-known problem, as the report published in 2011 suggests. The forecast predicted an estimated loss of 50'000 physicians in the medium term, precisely between 2011 and 2027. Among the main causes, they included the increasing number of retiring professionals and the migration trends, in and out of the country.

Despite the forecast has proven to be wrong in numerical terms, with the losses being overestimated, more recent reports seem to agree that, in the long-term, this trend may bring the system into a collapse. Indeed, the only reason why the estimates were misleading was due to the enactment of a pension system reform in late 2011, which strongly delayed retirement age.

These reports also emphasize the need of changing the legal structure behind the National Health System, in particular with respect to the abolishment (or, at least, the enlargement) of the so-called “*numerus clausus*”, in particular in relation to the access to the post-graduate specialties. This rule sets, on a yearly basis, the maximum spots available for undergraduate and postgraduate medicine programs. This has a two-fold implication: first, in relation to the number of employable doctors, as the Italian legislation deliberates that only doctors with a specialty degree can be actually hired by the *SSN*; and, second, in relation to career opportunities, attempting at avoiding excessive migration towards other countries. The eventual abolishment or enlargement of the “*numerus clausus*” may really prove to be effective: career opportunities and appropriateness of training are among the main reasons behind the migration trend of Italian graduates (Riccò, Vezzosi, & Balzarini, 2020); in this sense, enlarging the available spots for students would result in greater employability opportunities and, consequently, greater incentives not to go abroad.

The problem with enlarging or abolishing the clause has a mere bureaucratic nature: the decision on the precise number of students to be enrolled in each academic specialty takes place in the Ministry of Education, on the basis of forecasts provided and evaluated by a committee composed of members coming from the Ministry of Health, the Ministry of Education, regions, universities and medical schools. In other words, decisions are taken on a multi-level basis, that often sees several conflicts of interest arising and different positions fighting. Moreover, if the current criteria for accessing specialties will remain unchanged, it has been forecasted by the previous articles that general practitioners (including also the so-called “*Medico di Famiglia*”) and some specific areas (i.e. pediatricians and cardiologists) will be damaged far more than others. For this reason, a combined effort of authorities in charge of evaluating the number of spots available in undergraduate and postgraduate careers is required and will have a crucial role in the future in terms of ensuring the sustainability of the Italian healthcare sector.

In conclusion, the actual legislations set significant limitations to improvements of the conditions of already-employed healthcare workers and to the workforce enlargement. Moreover, the bureaucracy

and the length of undergraduate and postgraduate programs seem to suggest that, in this sense, no solution can be reached in the short-term, but only in the medium to long-term.

For this reason, as Chapter 5 will discuss, other tracks need to be beaten to ensure short-term changes, contemporarily focusing on legislative and bureaucratic adjustments in order to ensure long-term sustainability.

3.1.2 – German Healthcare Workforce Management System and Problems

The German healthcare system is profoundly different with respect to the majority of other European systems. The fact that Germany is a Federal State is completely reflected on the management system of its healthcare sector. Indeed, powers are shared between the Federal State, States, health insurers, regulatory bodies and various providers and professionals – in this sense, insiders have defined the German system as “self-administrating” (US American National Library of Medicine, 2015).

The Federal Government, and its Ministry of Health, within this framework, has wide-ranging powers, in financial and regulatory terms. In other words, it is responsible for drafting health policies at the national level and prescribing administrative guidelines to be followed by self-governing entities. In particular, it coordinates several agencies when it comes to higher-level issues of public health, including drug prescriptions and, in latest years, Covid-19 nation-wide management. Moreover, they are responsible also for channeling existing funds towards sanitary structures, deliberating upon whether to invest in physical resources or human resources.

Another important body is represented by the Federal Joint Committee, whose main tasks regard the acknowledgement of sanitary services to be covered by the statutory health insurance that enrolls about 86% of the German population. These coverage decisions are drafted on the basis of comparative reviews and risk-benefits assessments. It is a regulatory and decision-making body that is composed of thirteen voting members, coming from associations of providers and other types of funds, such as sickness funds. It is notable the presence of five patients, that have only an advisory role, chosen in order to have a direct feedback. Each State, moreover, is entitled to supervise Public Health Agencies that work in close contact with Hospitals, Sickness Funds and Statutory Long-Term Care Funds and their respective associations.

The structure, broadly speaking, seem to be extremely fragmented and vertically-oriented, but the final outcome is one of the efficient systems in Europe, particularly because the associations of each main body manage to reflect the needs of their representatives and, following the requests, federal policies manage to be extremely accommodating. However, particularly at the Federal Level, there is room for improvement, as the lack of foresight displayed in the last decades has proved to be extremely harmful for professional. Another area where adjustments are needed regards the horizontal and vertical coordination between different institutions, as will be explored later in the paragraph.

The straightforward consequence is an efficient number of doctors and nurses, well-above the EU average. Indeed, Germany displays an average of 4.4 doctors and approximately 14 nurses per 1000 citizens, compared to the results of the European Union that amount respectively at 3.9 and 8.4. Another interesting fact is that the distribution of workers is homogeneous among all the different

States. However, these numbers hide an unpleasant issue: the high workloads that professionals have to deal with on a daily basis.

Employment issues are managed, as usual, at different levels. At the Federal level, the Ministry of Health (*BMG*) and the Ministry of Labour and Social Affairs (*BMAS*) are required to draft nationwide policies and regulations, to be followed by lower levels. The licensing and registration of workers, on the other hand, happens at the State level, through the work of State Medical Associations. They are also entitled to set and ensure adherence to professional standards and practices.

Lastly, at the lowest level, one may find Doctors and Nurses Associations that, as said, do not have any regulatory powers, but they limit their actions to expressing needs and concerns of the category they represent.

Interestingly, also Germany displays the “*numerus clausus*”, but the choice, in this case, has proven to be extremely efficient. Indeed, newly-graduated doctors are extremely likely to find employment as soon as the graduation takes place, also because of the growing demand for medical personnel. However, German graduates are also witnessing a trend that sees an increasing influx of foreign doctors. Indeed, greater salaries (compared to the European average), greater career opportunities and, in most of the cases, technological resources are extremely appealing. Moreover, the fact that current regulations pose fewer restriction in terms of hiring EU doctors rather than German doctors are concerns that have often been raised by State Medical Associations.

On the other hand, the situation for nurses is different. The high workloads that nurses have to bear have often been explained through problems of staff shortages – however, this explanation falls short: Germany, as said, ranks third in Europe in terms nursing density.

In reality, the “workload problem” has far deeper roots: Germany has lacked coordinated hospital planning repeatedly over time. The fragmentation of powers brings about the fact that *Länder* bear the responsibility for hospital planning and financing, whereas insurance funds bear operating costs management. The absence of coordination between these institutions creates an inefficient outcome: given the very large number of hospitals, most of them operate uneconomically, creating a greater demand for skilled personnel.

This fact, that partially explains the data on nursing density, triggers greater workloads for specialized personnel, and nurses in particular, and poorer treatment outcomes, as staff lacks routine. To sum up, greater specialization and less structures would result in more efficient and higher quality care, decreasing workloads for nursing staff, as patients would be driven towards ad-hoc structures. In other words, the “staff shortage” explanation is, in reality, true, but derives from the absence of coordination between different levels.

However, what is probably more concerning for Germany and its healthcare system are the issues created by the lack of digitalization. The Federal State, responsible, as said, for national policies has repeatedly delayed substantial investments in technologies. It must be specified that, in this context, by technologies, it is meant all the innovations that could lead to more efficient workforce planning, not machinery or technologies related to treatments, on which Germany is extremely well-placed in international rankings. Lacking in management technologies implies overusing and misusing available resources, human and physical. The absence of updated cloud structures, with patients’

documentation still predominantly non-digital, leads to unnecessary repeated exams, more difficult linking between structures and, ultimately, greater workloads for professionals.

In conclusion, the structure of the German healthcare system is, under the majority of aspects, extremely efficient and comprehensive, in particular with respect to doctors. However, the labor mobility trends and the lack of management technologies often create greater workloads and inefficient use of resources.

The Federal Government and its Health Ministry are required to intervene more than other institutions, by channeling additional investments into healthcare technologies and preventing existing labor mobility trends to create outflows of workforce towards other nations.

3.1.3 – American Healthcare Workforce Management System and Problems

The features of American healthcare system, characterized by a multitude of different insurance programs encompassing both the public and the private sphere, alongside its intricate organizational mechanisms, result in a fragmented framework in terms of workforce management.

The coexistence of public programs, such as Medicare and Medicaid, and private insurance providers contributes to a variety of employment practices, regulatory considerations and compensation schemes.

Moreover, the usual complex interplay between Federal, State and Local Governments, on one side, and the private sector, on the other side, is reflected in this regard. Indeed, there is a strong and vertical coordination among different levels, in a sort of pyramidal hierarchy.

Institutions and regulatory bodies from the highest level, the Federal level, are required to implement nation-wide policies, similarly to what happens in Germany.

The *Health Resources and Services Administration (HRSA)*, embedded within the Department of *Health and Human Services (HHS)*, is responsible for healthcare workforce planning and data collection, performing regular reports on needs and urgencies.

Among their duties, one of the most important is to ensure a homogeneous presence of workers in all medical specializations and in all geographic areas. This duty is assigned to a specific program: the *National Health Service Corps (NHSC)*, under the supervision of the HRSA, that focuses on offering mostly scholarships and loan repayments to professional who agree to work in medically underserved areas. Through the working of this program, shortages in specific medical areas, such as primary care or mental health, are avoided.

The Federal Government is also required to supervise on the financing of public programs (particularly Medicare and Medicaid) and healthcare workforce programs, administering programs offering grants to professionals or newly-graduated individuals who opt for working in underserved communities – consistently with the view of ensuring coherent uniformity in services provision.

Given the inherent different features of each US State, each of them has more specific duties in terms of healthcare workforce management. In particular, they are responsible for licensing and regulating healthcare professionals, by setting requirements for education, training and required competencies. Moreover, by defining the scope of practice for healthcare professions, outlining which tasks and procedures physicians, nurses and other insiders are allowed to perform, they have important powers in terms of impacting the distribution of healthcare services.

Lastly, given the indications provided at the Federal Level, each State, given income distribution and other features of their population, are allowed to set out requirements for accessing publicly-provided programs, including, but not limited to Medicare and Medicaid.

Local governments share significant powers over the organization and delivery of healthcare treatments and in the supervision of private healthcare institutions. Their role, in the pandemic context, was extremely delicate, being responsible for emergency preparedness: indeed, in this regard, their role is to ensure an efficient and coordinated response by public and private structures, ensuring that the workforce is well-skilled and capable of managing stressing situation effectively. Moreover, they are also responsible for the management of healthcare institutions located within their jurisdiction and prevention through public health initiatives.

Private structures, on the other hand, enjoy the possibility of having a wide range of action: in particular, each of them has established a human resource department vested with the responsibility of employment and staff provision. The *quantum* of professionals is not constrained by any specific federal or state regulation, though it is possible to ask national agencies for support when the needed professional quantum is not reached. The freedom, in this sense, coexists with the imposition of national legislation in matters of standards of practices and required competencies.

Their coordination with local universities assumes a crucial role in facilitating and speeding the training of specialized personnel across different medical domains – encompassing disciplines stretching from surgery to nursing.

Generally speaking, the US healthcare system, with its combination of private and public structures is regarded as being extremely efficient, but the pandemic, increasing demand for healthcare services as well as skyrocketing expenses, has contributed to exacerbate existing problems. Investments in technologies and in education, despite being relatively higher than similar upper-income countries, have not been sufficient to ensure a homogeneous distribution of professionals, and, for those who are already employed, the risk of burnout, either physical or psychological, is extremely likely to be a serious threat.

The shortage crisis is an extremely serious issue for the American healthcare system, being the root for multiple subsequent problems, such as prolonged admissions to hospitals, delayed treatments and medical malpractice. The estimates provided by the *SHRM (Society for Human Resource Management)* sound extremely concerning, with more than 30,000 doctors, with different qualifications, needed and about 80,000 nurses.

Existing trends in the healthcare labor market are contributing to worsen this situation: not only doctors, because of existing macroeconomic conditions (i.e. due to inflation) are earning relatively less than what they used to earn in the last century, but also the fact employment contracts for newly-graduated professionals, either doctors, nurses or technicians, are changing in a way that gives no stability to the whole system.

Since the outbreak of the pandemic, given the for-profit nature of the majority of private healthcare infrastructures, doctors have been employed by means of temporary contracts, with variable length,

that, despite guaranteeing them higher wages, create serious problems on instability among sanitary equips. As a consequence, indeed, the *Joint Commission*, a federal agency in charge of monitoring different types of hospital facilities, reported a 19% rise in adverse events and medical malpractices in 2022. The rise in adverse events is partially explained by lack of familiarity between medical teams and partially by the worsening mental and physical conditions of workers, usually known as “burnout”: awareness on the working conditions of medical physicians and nurses is growing, similarly to what is happening in the majority of other world countries.

However, despite the increasing concern, most organization in USA, particularly those with a private and for-profit nature, still tend to prefer devoting resources to improve safety on the working place, rather than safety of the workforce. Indeed, following the study carried out by the *Stanford University School of Medicine*, entitled “Physician Burnout, Well-being, and Work Unit Safety Grades in Relationship to Reported Medical Errors”, physicians’ burnout is at least responsible for medical errors as unsafe medical workplace conditions.

The impact of burnout on physicians, that will be explored deeply in the next paragraphs, has further implications: it has the potential to worsen dramatically the problem of staffing shortages.

Work-life balance deterioration, coupled with burnout, stress and depression levels rising is likely to make a career in medicine less appealing to students and, for already-graduated professionals, the strive for an early retirement more than a mere suggestion.

3.1.4 – Final Remarks

Notwithstanding the inherent differences within the regulatory and management framework of the above-mentioned healthcare systems, they are often characterized by similar problems.

Italy and USA share the problem of staff shortages, though with different magnitudes and roots. In Italy, this issue is the “natural conclusion” of decades of mismanagement and lack of foresight, that assume the shape of regional disparities and aging workforce. In USA, on the other hand, the coexistence of public and private structures and the vertical coordination between different levels of governance and institutions create a strong fragmentation of the underlying workforce management framework, that in turn results in varying employment practices and strategies.

The main concern of the German system regards the lack of digitalization, that triggers slow and inefficient cooperation among different structures, ultimately heavily burdening workforce and reducing hospital effectiveness.

Doctors, nurses and all the other professionals involved in sanitary structures had been already severely hit by these issues prior to 2020, and the outbreak of the pandemic contributed to the worsening of the situation. The upcoming paragraphs will delve into details in matter of the strains created by the pandemic on healthcare workers. These strains have taken various shapes, from mental and psychological burnout, to higher stress level and post-traumatic stress syndrome.

3.2 – Physical and Mental Burnout among Healthcare Workers due to the Covid-19 Pandemic

Entrepreneurs, employees and students of all categories have been severely affected by the pandemic. Working immediately became difficult, because of the imposed regulations of authorities: lockdown

and social distancing were prioritized over any type of “non-essential activity”. In a sense, working had become a privilege.

Doctors, nurses, technicians and other types of professionals, however, became the primary “*defense*” for the population, called into a combined and prolonged effort since the first days of the pandemic. All of a sudden, their workplace, already inherently risky, became extremely unsafe, not only because of the significantly higher probability (with respect of the rest of the population confined at home) of contracting the virus, but also because of more subtle and invisible threats: stress, psychological problems and, ultimately, burnout.

The sense of responsibility of the sanitary workforce towards the population has assumed various shapes: retired physicians did not hesitate in assuming again the duty, exhausting hospital shifts, auto-imposed social distancing in order to avoid family contagion and direct support to victims’ families. The consequences of this period are far from being settled, in particular from a psychological point of view. Understanding this impact from various perspectives will be the leitmotif of the following paragraphs: understanding how severe this problem is, with a quantitative and qualitative analysis of the magnitude of professionals affected, deriving how the stress has affected or may dampen the future daily working life of the personnel affected.

3.2.1 – Quantitative Analysis on the Psychological Problems among Healthcare Workers associated with the outbreak of the Covid-19 Pandemic

Understanding the magnitude of the psychological impact of the pandemic on the sanitary workforce is essential to uncover certain patterns and trends arisen ever since and, adopting a future perspective, for the implementation of targeted and supportive strategies, that will be explored thereafter.

The aim of this analysis is to understand, through the lens of surveys and official medical articles, the main symptoms, illnesses and problems that healthcare workers, in particular front-line specialists, have reported. The study will begin by analyzing country-specific data, and will proceed by making cross-country and longitudinal comparisons, whenever and wherever possible.

The articles used for the analysis have been provided by official sources, ranging from national medical bulletins and national statistical reports to scientific journals.

Conducting this analysis may prove to be extremely useful for the establishment of future plans of actions, in order to overcome the existing problems mentioned in previous paragraphs and for relieving the physical and psychological loads burdening workers. Stated differently, the conclusions that will be drawn from the analysis will be used as a starting point for the draft of future health policies.

As the results will show, findings have often diverged across the three systems analyzed. Expectedly, outcomes have also exhibited variations across distinct medical domains and geographical areas: frontline workers and pneumology workers, arguably the most profoundly impacted areas, have reported higher levels of stress, often combined with increased workloads and higher perceived risks on the workplace.

In Italy, the report conducted by S. Barelo et al. (add bibliography) entitled “*Burnout and somatic symptoms among frontline healthcare professionals at the peak of the Italian COVID-19 pandemic*”,

explores psychological stress among frontline workers during the first waves of Covid-19. In particular, the sample of 376 specialists, selected for being the most exposed to “develop Covid-19 related health consequences”, showed high levels of stress and changes in personal habits (Barello, Palamenghi, & Graffigna, 2020).

In particular, 139 members (corresponding to 37.0%) reported high levels of *emotional exhaustion*, while 93 of them (corresponding to 24.7%) reported high levels of *depersonalization*. The psychological problems took various shapes, among which the most frequent involved (i) increased irritability, (ii) change in food and life habits, (iii) difficulties in falling asleep, combined with (iv) nightmares and (v) nervous breakdowns.

Oppositely, arguably the most interesting finding regards the fact that 200 frontline workers in the sample, i.e. 53.2%, exhibited high levels of *personal gratification*.

However, as specified by the authors, results cannot be considered as representative for the whole country and for all categories of workers, given the restricted period of time considered and the requirements for being involved into the survey.

The issues found in the previously-mentioned publication have been solved by the article entitled “*Prevalence and determinants of Italian physicians’ burnout in the “post-COVID-19” era*”, by E. Fiabane et al., published in November 2022. The findings are, on one side, more comprehensive, given the larger sample, made by a total of 958 physicians and professionals of different types, and the prolonged duration of the observation. On the other side, however, it must be specified that the respondents cover only a precise and restricted geographical area, the northern region of Lombardy, arguably the most severely hit by the pandemic, and a single specific category of workers: physicians. Stated differently, results cannot be generalized for the whole Peninsula, but remain extremely advantageous, allowing to understand the magnitude of the impact on workers in the worst-case scenario and in the post-acute waves of the pandemic, given the presence, at the time of the publication, of the Covid-19 vaccine (Fiabane, et al., 2022).

The longitudinal comparison between the first and most severe phases and the subsequent and more manageable stages is performed in order to confirm findings from other publications (Giusti, et al., 2020) in terms of magnitudes and spread of burnout among workers, and the risk factors contributing to the worsening of symptoms, including but not limited to (i) increased workloads, (ii) fear of infection, (iii) social isolation and (iv) different degrees professional position and expertise.

The findings, in this regard, clearly highlight a strong presence of burnout symptoms among frontline workers, as 178 specialists (18.5%) presented “*clinically relevant symptoms of burnout*”. The analysis is not completed whatsoever: 686 respondents reported either an auto-diagnosed or medically-accredited presence of burnout symptoms throughout the course of the pandemic (71.5%), and 485 out of 733 responded that these occurred after the outbreak of the pandemic. Claiming that the psychological stress will have long-term implications for the sanitary workforce is reflected in the fact that 570 physicians reported the perceived risk of incurring into burnout in the future.

With the intention of providing further specifications, 688 out of the total sample (72%) have worked in direct contact with Covid-19 patients in minimum one of the three major waves.

The importance of appropriate medical education and clinical training programs, particularly in psychological terms, is evident in the fact that there is a negative correlation between presence of burnout and experience in the workplace (measured through years in service): in other words, the

lower the experience, the more likely burnout symptoms are to occur. Symptoms are also more likely to be present in physicians with lesser work or contract stability.

In Germany, researches have reported similar perceived risk factors but different magnitudes within the three main sectors of the healthcare infrastructure (Frenkel, et al., 2022): hospital, pre-emergency care and outpatient clinics. (i) Fear of transmission, (ii) interference of workload with private life, (iii) uncertainty or lack of knowledge and (iv) concerns about the team have been reported as being the four main work stressors, in particular during the early stages of the pandemic. With the evolution of Covid-19, and the subsequent updates in policy measures and raise in awareness, another work stressor became extremely important: (v) work stability. In this sense, work stability must be understood in a two-fold perspective: not only in mere economic and contractual terms, but also in “*specialization terms*”. The fact that approximately half of the participants in the survey (615 respondents) reported a change in their functions and roles has generated concerns regarding their adeptness in a new and altered scenario. On the whole, the establishment of social distancing and supportive economic and regulatory measures has proved to be extremely approved by professionals, and has partially contributed to alleviate the psychological burden on workers. This is particularly interesting compared to the Italian situation, where the extensive and mandatory presence of PPEs has been considered by the majority of respondents as a stress factor.

The fact that Germany was less affected by the pandemic compared to other European Countries is mirrored on the moderate stress levels among its workers. In particular, the relatively lower impact of the disease, combined with the preventive measures taken by the German national government, contributed to lower average stress levels among practitioners and nurses. However, some specifications must be made, as stress and fatigue level significantly differed across the three sectors: outpatient clinics workers, indeed, showed higher levels of stress, because of the screening and testing responsibility. The efforts of authorities were mainly devoted to the expansion of hospital capacity, though already well-prepared if compared to other EU Countries, rather than to the management or improvement of testing and screening activities: the capacity of this sector was repeatedly tested, causing greater stress in its employees.

Similar articles, on the other hand, does not seem as encouraging as the above-mentioned publication. Indeed, a study carried out during the first wave of the pandemic in the Augsburg hospital suggest other significant differences in stress levels among workers of different categories within the same healthcare sector. Indeed, compared to physicians, nurses reported more frequent burnout symptoms and increased stress levels, with job strains (i), uncertainty (ii), care for people and relatives (iii), psychosocial strains (iv) and infection risk (v) being the main factors contributing to the findings.

These results can be compared with the findings for Italy showed in the article published by S. Barellò et al., not only because they refer to a specular time period, precisely March-April 2020, but also because they use the exact same standardized questionnaire: the *Maslach Burnout Inventory (MBI)*, a validated survey composed of 22 questions, that evaluates levels of emotional exhaustion, depersonalization and personal gratification, measured through a scale that ranges from a minimum value of 0 (“*Never*”) and 6 (“*On a daily basis*”).

German physicians working in direct contact with Covid-19 have reported lower levels of stress compared to both German Nurses and Italian workers (Zerbini, Ebigbo, Reicherts, Kunz, & Messman, 2020). On the other hand, similar problems and concentration of psychological consequences

characterize these last two categories. Disparities in levels of fatigue and exhaustion among different categories of workers in Germany seem to indicate the compelling and non-deferrable imperative to substantially realign current trends, in view of redirecting adequate resources towards pre-hospital and outpatient clinics and psychophysical traineeship programs for nurses and other specialists.

In USA, the construction of a country-wide statistically relevant sample of observations is far more difficult if compared to other two jurisdictions, due to the inherent features of its national healthcare system (i.e. heterogeneity in medical institutions) and the social and geographical features of the country (i.e. country's total surface and population). However, in the article published on the *Mayo Clinic Proceedings* Journal, the authors managed to perform a comprehensive assessment on workers, from different institutions and with different specialties, and over time, concluding a project, started in 2011, aimed at providing much needed information on the psychological status of the American healthcare workforce.

The sequence of the initial four observations began in 2011, with following intervals of three years, originally ended in 2020. However, the development of the pandemic, the additional defense brought in by vaccines and the updates in crisis management tools led authors to perform an additional investigation in 2021.

The most interesting find, arguably, concerns the fact that in the 2021 observation there has been a significant increase in burnout manifestations among practitioners: 62.8% (1532 respondents) of physicians compared to 38.2% of early 2020 and 45.5% of 2011. This finding has been probably caused by the parallel decrease in satisfaction levels, approximately 16%, and increases in depression and social anxiety levels.

Nevertheless, further clarifications must be made: practitioners delivering care without adequate PPEs and those who suffered from the worsening of economic condition due to the postponement of elective surgeries reported more frequent manifestations of severe stress, depression and other symptoms of burnout. The most threatening finding made regards the fact that merely 1097 physicians of the total 2440 respondents (57.1%) declared that “*would choose to become a physician again*”, well-below the results of 2017 and 2020: respectively 72.2% and 68.5%. The results implicitly suggest the urge of devoting additional efforts towards the care of medical personnel.

Moreover, this last statement is confirmed by the results coming from the test for adequate work-life balance, where respondents were asked to evaluate whether actual workloads left enough time for private and personal life. If combined, the results of physicians who answered “*disagree*” and “*strongly disagree*” included approximately 52.4% of the total sample.

In conclusion, the comparison that the article enables to perform, analyzing sets of data from different years and completely different contexts, allows to appreciate how the mental status of US healthcare workers has dramatically worsened in the recent period: the presence of burnout, that until the pandemic outbreak had oscillated around 45%, before reaching an all-time low of 38.2% in the pre-pandemic months, peaked in 2021, despite physicians having had a significant two-year experience in crisis management.

3.2.2 – Findings and discussion

Some conclusions can be drawn given the findings in these articles: healthcare workers from all the three countries have shown a concerning tendency to suffer from symptoms of psychological burnout: Italian, German and American healthcare workers reported similar symptoms and breakdown

episodes that hid specular conditions. These symptoms have taken several shapes, ranging, as said, from mental breakdown episodes to increased levels of stress on the workplace.

However, it must be specified that, while USA and Italy reported similar levels of stress and burnout among its physicians, in Germany, the reported cases have been substantially lower and less concentrated.

These consequences, far from being ultimately settled, seem to be caused from similar stressors, among which (i) contract stability, (ii) country-wide safety measures and policy indications, (iii) workloads, (iv) uncertainty on the workplace and (v) infection risks have been reckoned as the most popular.

In particular, contract stability was negatively associated with burnout symptoms: physicians involved in traineeships and those employed with fixed-end contracts have reported more frequent episodes of psychological distress. Oppositely, greater workloads, greater uncertainty on the workplace and greater infection risks showed a positive association with burnout and stress: extended work shifts, recurrent changes in duties on the workplace and frequent involvement in Covid-19 wards link positively with presence of burnout symptoms among workers.

The relation of country-wide safety measures and policy indications with burnout symptoms and diagnosis must be understood in detail: strong variations across healthcare sectors and different specialties have created an ambiguous relation among the dependent (burnout diagnosis) and independent (safety measures and policy indications) variables. In the case of the German hospital sector, measures implemented by the Federal government proved to be extremely favorable for professionals, whereas workers in the outpatient clinics sector were burdened with additional responsibilities that caused periodic symptoms of psychological distress, leading to more frequent and concentrated burnout diagnosis. In USA, on the other hand, measures required for general practitioners and the deferral of non-urgent and elective surgeries imposed additional sources of stress for those non-directly involved in Covid-19 wards.

Italian doctors and nurses were the only category that, in concomitance with the first waves of the pandemic, exhibited increased levels of personal gratification. Contrarily, results in terms of work-life balance dramatically worsened since the first waves of the pandemic, with similar results in all three cases.

The main stressors highlighted may suggest to authorities useful starting points for the drafting of future health policies. However, despite the similar results in the countries analyzed, it would be reasonable to expect significantly different types of interventions: the political fragmentation of the US and Germany may allow for greater influence of single States and Länder, whereas in Italy, despite the presence of a central response, regions may request the implementation of ad-hoc measures, given the different necessities.

To conclude, the researches taken into account sustain that psychological problems that have impacted workers' stability and well-being are far from being completely settled. The reported problems, indeed, are not limited to the private and personal sphere of workers, but may trigger unwanted consequences on the workplace, among which medical malpractices and errors are extremely dangerous. Although studies have demonstrated the absence of a direct association between the pandemic and the rise in medical error rates, the increase in burnout diagnosis, mainly attributable to the former, is the main cause of the latter. The importance of monitoring psychological variables and medical error rates has a two-fold perspective: firstly, in view of safeguarding

healthcare workers' mental status and, secondly, for avoiding unnecessary challenges in terms of patients' safety and care.

Chapter 4: The impact of Covid-19 on Hospitalization, Sanitary Structures and Medical Equipment

The outbreak of the pandemic, as repeatedly discussed throughout the last two chapters, has profoundly affected the analyzed country's healthcare system to different extents. Specifically, the sanitary infrastructures and its capacities were forced to face severe challenges. The deferral of scheduled, but non-essential, surgeries and the simultaneous reallocation of resources within healthcare facilities have often been the primary actions undertaken by authorities in order to accommodate the rising demand for intensive care units and medical equipment.

The challenges and the strains faced in terms of structures, equipment and hospitalizations, contrarily to the analysis in chapter three, had severe impact on the whole society rather than solely on workers involved in the sector. While the unavailability of ICU beds and medical equipment, particularly remarked during the first waves of the pandemic, have required additional efforts, often coming also from non-medical enterprises, for relocating patients and reallocating resources, the dramatic decreases in hospitalization rates have created problems that, despite the actual endemic status of Covid-19 in the countries analyzed, have not been settled yet. Specifically, the obliged lack of control on certain medical conditions, of different nature, has often triggered dramatic deteriorations in the health status of patients, that are likely to be in dire need of treatments in the upcoming future. In this sense, the dramatic consequences of the reduction in hospitalizations are extremely likely to represent a serious menace for healthcare sectors in the foreseeable future.

However, the three countries discussed, given the inherent differences in several factors, from beds availability to equipment provision, performed differently during different stages of the pandemic. Moreover, another justification from the differences arisen in these regards can be found in the national policy indications and reforms: Germany, for example, managed to avoid shortages of ICU and general care beds because of targeted investments and policy indications concerning hospital admissions. Conversely, the situation in Italy and in USA needs further information and descriptions, as the status of healthcare infrastructures before the pandemic created different scenarios. Similarly, in terms of provision of sanitary equipment, Germany has made use of its efficient manufacturing and pharmaceutical sectors, while Italy and USA, in different ways, have found more difficulties in supplying their respective infrastructures with adequate and technological resources.

The first half of the chapter will concentrate on the decrease in hospitalization rates for non-Covid-19 diseases, with particular emphasis on its implications in the pandemic context and the conclusions that can be drawn from the findings. The second half of the chapter will be devoted to the consequences that the pandemic has created respectively to sanitary infrastructures and supply chains of medical equipment.

4.1: Decrease in Hospitalization Rates – Cross-Country Analysis

Following the outbreak of the pandemic, new phenomena and trends have emerged in the global healthcare landscape, among which one of the most significant is undoubtedly represented by the reduction in hospitalization rates. The implications of this phenomenon need to be explored carefully, in view of properly understanding its drivers and its plausible implications. Indeed, because of its

complex nature, that involves complex interactions between socio-economic determinants, medical technologies and healthcare sectors, causes of this phenomenon are also misunderstood with possible consequences. Claiming that the decrease in hospitalization rates for non-Covid-19 diseases is attributable to rapid increase in demand for medical services contributes only partially to explaining the whole picture. Stated differently, there are other variables to take into considerations: the pre-pandemic status of the healthcare system or policy efforts may be useful in offering a complete understanding of the fact.

Country	Acute Care beds (per 1,000)	IC Units (per 100,000)	Physicians (per 1,000)	Nurses (per 1,000)
Italy	2.6	8.6	4	5.8
Germany	6	33.9	4.3	12.9
USA	2.4	25.8	2.6	11.7

Table 1: Pre pandemic status of the capacity of analyzed healthcare systems (source: “[How the U.S. compares to other countries in responding to Covid-19](#)”)

The table above, that consists of data from February 2020, prior to the outbreak of the toughest phases of the pandemic, is extremely eloquent: as the paragraph will demonstrate, Germany managed to avoid excessive reduction in hospitalization rates because of a combination of Federal policy efforts and greater pre-pandemic capacity, relatively to Italy and USA.

The Italian healthcare system, in particular, in the period between the early stages of the pandemic, concomitantly the first lockdown phase, and the end of 2020, observed a generalized and remarked decrease in non-urgent surgeries and treatments (Spadea, et al., 2021). In more severe circumstances, for patients in urgent needs of treatments or surgeries, the emergency was not able to put at risk the ability of the National Healthcare System of providing timely responses. In this sense, the fact that no significant variations have been reported across regions is extremely eloquent: regardless the higher burden of Covid-19 on northern regions, sanitary structures have managed to provide timely responses to the cases in danger. Central and southern regions, helped by the relatively lower impact of the pandemic, though still severe, managed to keep essential surgeries on level similar to the pre-pandemic.

Oppositely, it is essential to highlight the emergence of new dynamics and trends: for non-essential surgeries and for deferrable treatments, indeed, patients and doctors have often conducted a comprehensive assessment including the potential risks in case of surgery deferral and the serious menace of contracting Covid-19 against the benefits of performing the surgery given the conditions of the patient and the actual capacities of the sanitary structures. The consequences of these analysis were similar across different medical areas: decreases in surgeries and in diagnosis.

Undeniably, the parallel decrease in hospitalization and in diagnosis is likely to be the result of a combination of multiple factors. Self-imposed limitations caused by the threat of contagion and reduced mobility have contributed to the reduced demand for testing and screening activities.

In conclusion, different trends have taken place according to the medical area of reference: volumes of lung cancer surgeries have remained steady if compared to pre-pandemic levels, while breast and

prostate surgeries suffered from more frequent deferrals. The lower amounts of cardiology surgeries can be partially explained by the factors above, and partially by the reduction in mobility and other environmental factors.

The scenario, in the German case, appears similar, at least in principle, to the Italian. Indeed, during the first waves of the pandemic, a reduction in non-Covid-19 admissions has been reported, consistently with the findings in other European nations and, as will be discussed, in the US, though with a smaller magnitude with respect to the latter.

The decrease can be explained, in part, by the policy decisions at the Federal level: despite the relatively higher capacity, recommendations imposed more stringent standards for inpatient admissions. The original idea consisted in devoting the majority of resources for the pandemic emergency response, and, though it has been extremely effective in this sense, it also contributed to increased burdens for the outpatient clinics sector and rise in out-of-clinics mortality rate.

However, while, Italy, during the post-lockdown phase, showed an increase in hospitalization rate, the stringent admission criteria set by the German government, that have been revoked only recently, impeded overcompensations in inpatient cases.

The implications may have severe consequences for the safety of citizens: the admission criteria have often been considered extremely stringent, and as such the German healthcare sector has been criticized for being “overly aggressive” (Spadea, et al., 2021).

Another implication stemming from the implementation of the standards required for hospital entrance is the observed change in care pathways. The observations made showed that, particularly during the early stages of the pandemic, the standards, along with changes in patients’ behavior and the scarcity of healthcare resources for specialized disciplines, created a trend that saw more citizens choosing optional healthcare insurance and using outpatient clinics for the provision of screening activities. While private healthcare insurance may be thought of as a positive aspect for the general safety of the public, the additional strains on outpatient clinics have contributed to a general worsening of the situation.

The American healthcare system, in conclusion, displays similar findings with respect to the Italian one, despite the inherent differences in terms of nature, structures and accessibility. In particular, between January and April 2020 the rate of hospitalization for non-Covid-19 diseases dropped by a factor of approximately 50% (Cassel, Zipfel, Bansal, & Weinberger, 2022), before a moderate rebound in the following summer. In the majority of medical areas, however, pre-pandemic levels have not been reached yet. The drivers recognized behind this factor happen to closely resemble those emerged in the analysis of Italy and Germany; specifically, changes in patients’ medical attitudes, pandemic-cases prioritizations and citizens’ reduced mobility. However, in addition to the existing drivers, the decrease in hospitalization, heavier in private rather than in public structures, has been caused by a particular factor that extends well-beyond pure medical dynamics and pertains more to a socio-economic sphere: the decrease in the rate of adhesion to private insurance schemes.

The lower adherence to private schemes is the result of a series of intertwined factors: uncertainties and risks faced by insurance companies dampened their ability to specify costs and coverage of their plans and the widespread job losses obliged citizens to renounce to insurance, particularly if offered as a side benefit to the salary.

The situation was partially solved by federal interventions, by relaxing the prerequisite for being enrolled in publicly-provided healthcare insurance schemes. The extended eligibility criteria, in the case of Medicaid, led to a significant expansion in population coverage, for a total amount of 1.2 million citizens, targeting primarily children from poor families and non-elderly adults (between 27 and 44 years old) which suffered from severe personal and economic strains following the consequences of the pandemic and incurred into loss of employer-sponsored plans.

The rationale underlying these policy measures was to offer citizens a certain level of stability in terms of healthcare coverage: in line with this idea, indeed, central interventions also targeted a reduction in the rate of disenrollment from public plans. In line with this idea, disenrollment from Medicaid reported a substantial decrease (Sun, Staiger, Chan, Baker, & Hernandez-Boussard, 2022) in 2020, if compared to 2019. It must also be clarified that public insurance eligibility criteria were drafted, upon Federal directives, on the basis of state-specific dynamics, and, as such, coverage, enrollment and disenrollment were not perfectly consistent across different areas.

In conclusion, lower disenrollment and greater public coverage created higher pressure on public structures rather than on private institutions throughout the most dramatic phases of the pandemic.

4.1.1: Decrease in Hospitalization Rates – comparison and future implications

The results showed by single countries appear extremely similar: during the early phases of the pandemic, the three analyzed countries focused on the pandemic emergency management, while adopting measures in view of relieving the burden on their infrastructures. Accordingly, hospitalization rates for non-Covid-19 diseases harshly fell, in relatively similar magnitudes in the three cases, despite the inherent differences in technologies, structures and coverage.

However, the decline in hospitalization rates went through different phases: the first months of the pandemic, with the policy measures undertaken by authorities, obliged citizens to avoid non-urgent treatments and screening activities, while successively, the relaxation of previously-implemented measures created a moderate rebound in rates, though pre-pandemic levels were not reached because of changes in patients' attitude and the persistent presence of pandemic consequences.

Interestingly, the ability of the three healthcare systems to provide timely responses to non-pandemic-related issues in dire need of treatments was not jeopardized in any of the cases. These findings highlight a high degree of resilience of healthcare systems in maintaining essential services despite the emergency.

The general decline, during the pandemic period, in hospitalization for non-Covid-19 diseases, caused by the multifaceted implications of the period itself, has been predicted (Spadea, et al., 2021) to be associated with an eventual, potentially remarked, upward pressure in the same phenomenon in the foreseeable future. The prediction comes from the fact that, in all the three systems, pre-pandemic amounts of treatments have not been reached yet. Indeed, despite the toughest waves of the pandemic having been seemingly overcome, the rebound in hospitalization rates has been only partial in the majority of medical domains of the analyzed countries. The main drivers of these future implications are likely to be the main causes of the decline itself: the postponement of screening and prevention activities and the change in citizens' attitude toward medical treatments. Each of these drivers is likely to have heavy consequences for the sustainability of a healthcare systems and need to be explained accordingly.

The implications of the first factor, the deferral of non-urgent treatments, are considered to have serious repercussions on the future workloads of medical structures: indeed, as the pandemic required prioritization of resources and personnel towards the management of urgent cases, the deferral of non-urgent cases has led to an accumulation of unattended medical needs, that presents a dual challenge. The first aspect is that it amplifies the potential rise in demand, as citizens will seek to address deferred issues, possibly leading to strains in medical capacities and difficulties in the ability of managing efficiently the additional requests. Moreover, the potential consequences from the deferments might create the need of more complex treatments.

Moreover, the evolution of citizens' attitudes towards medical treatments is likely to bring about the possibility of improving the current technological status of sanitary facilities. The increased difficulties in accessing medical structures obliged citizens to rely on digital health platforms and, in particular, on telemedicine. The forced acceptance of remote services is likely to create the need of reallocating existing resources and channeling new investment towards the establishment of new forms of care, while ensuring to maintain an adequate standard in terms of quality. The reliance on online resources and on an indirect contact with professionals may create the need of enhancing initiatives for promoting health knowledge towards the general public to enable them to make informed decisions. The implications are multifaceted: citizens, whenever possible, may decide to opt for telemedicine, relaxing the burden on sanitary facilities, and this may create the possibility of building more resilient and sustainable healthcare systems.

In conclusion, the observed decrease in hospitalization rates in the analyzed countries can be considered as an extremely important factor to take into consideration: indeed, not only it explains quantitatively the immense burden that the pandemic has created for healthcare infrastructures, but it is also likely to have important crucial implications, either positive or negative, depending on the future actions of policymakers. Indeed, if structures do not start providing the same pre-pandemic levels, in terms of quantity and quality of care, rapid surge in demand for pandemic-deferred treatments are likely to take place at any time in the foreseeable future. However, in view of reaching pre-pandemic levels, a combined effort of policymakers in charge of supervising sanitary structures, healthcare workers and citizens is required. Lastly, the emergency of the pandemic, in this sense may create the adequate premises for substantial technological improvements, in particular with respect to the employment of new formats of digital and virtual medicine.

4.2 – The Impact of Covid-19 on Sanitary Structure and on the supply of Medical Equipment

The previous paragraph highlighted how the pandemic affected the whole society, including healthcare workers working out of pandemic frontlines and citizens that, despite being not infected, required treatments. However, the effects on healthcare structures, such as private and public hospitals and outpatient clinics, and on the production of needed medical equipment need further analysis because of their immediate and future relevance.

Structures have often been readapted in terms of spaces and capacities in order to accommodate the rapid surges in demand, and policymakers signed strategic investments for the construction of new buildings in order to relax pressure on workers and facilities. In the eyes of policymakers, the research for allocative efficient immediately became a priority, and the decisions made, that will be explored

in the paragraph, consistently reflected this objective. Oppositely, the pandemic has highlighted the unpreparedness of production lines to meet unexpected emergency needs, in terms of products for the patients' care and workers' protection. Overcoming the toughest waves of the pandemic, in this regard, required a prolonged effort of enterprises, often from other industries, to readapt their business to have a more efficient distribution of demand. The readiness exhibited by certain business has been remarkable: readapting existing supply chains and leveraging existing technologies to the purpose of helping the community has been vital for overcoming the hardest phases of the pandemic. In this sense, private and public investments have served a twofold scope: firstly, private organizations have often managed to avoid declaring bankrupt because of pandemic-created strains, and, secondly, public investments have often been used as a catalyst for innovations in global supply chains that, without the emergency, might have taken years to materialize. In this regard, an important role was created also by international organizations which attempted to emphasize the necessity of fostering international collaboration to ensure an equitable distribution of resources towards the poorest areas of the planet.

The upcoming paragraphs describe how the pandemic, in the context of healthcare structures and sanitary supply chains, exposed vulnerabilities and weaknesses as well as examples of resilience and preparedness within the same healthcare systems. Moreover, it will describe how increased coordination and the share of knowledge and technologies in an international perspective might be useful for ensuring efficiency and preparedness against future challenges.

Broadly, the challenges faced by the Italian *Sistema Sanitario Nazionale* can be summarized in three main categories: (i) support to and safety of healthcare workers, (ii) ensuring standards in terms of quantity and quality of care and (iii) improvements in the status of healthcare facilities.

The first two categories have been studied in the previous discussions, while the third is the central topic of the current analysis, though the first two seem dependent, to a certain extent, to the latter. Indeed, structural challenges, such as expansions of original levels of capacity and improvements in digitalization have proven effective in relieving the burden on workers and on the ability of ensuring standards of care.

The fact that the distribution of the pandemic was not uniform in the peninsula caused greater incidence on the pandemic on northern regions and, consequently, different needs according to the geographical area. However, changes in sanitary structures followed similar lines of thought over the country: reorganization of spaces, whenever possible and within structures, aimed at implementing infection preventive measures and safe management of patients and personnel. Practically, investments made can be divided into three broad categories: (i) investments for safety of personnel and patients, (ii) flow management and structural changes and (iii) humanization of care (Parotto, et al., 2022). The second category makes up the largest share of investments made, including building of temporary and permanent furniture, adaptation of pre-existing structures for specialized Covid-19 treatments and digital improvements to existing structures.

The main challenges for Italy came relatively to the provision of medical equipment: the domestic market is, indeed, heavily dependent on imports, particularly from Germany and USA. The growing difficulties of accessing trade during the pandemic imposed severe additional strains and, Italy had to use a total amount of 50 million Euro allocated by the European Commission on March 19th, 2020, in the form of extraordinary support scheme for the production and supply of medical equipment.

Moreover, Italy relied also on medical supplies sent by other nations, such as China, in the form of *PPE*, respiratory devices and self-protection equipment.

The European Commission, moreover, created the so-called *Covid-19 Clearing House*, with the intent of closely monitoring demand and supply for medical equipment: its employees started working in close contact with national authorities and private producers in view of ensuring satisfied needs in terms of provision of supplies. The mechanism fostered public communication and information-sharing among Member States, monitored exports restriction by non-European countries and the global supply chain, managing to ensure greater coordination.

Germany, in particular, played a crucial role in ensuring that other European countries were able to match their short- and long-term supply needs. In this regard, Germany can be considered an extremely efficient example of how a healthcare system can be built, designed, and, consequently, adapted to mitigate the challenges posed by a major global health crisis.

In particular, as *table 1* demonstrates, prior to the pandemic, the European country had already invested in the expansion of its healthcare capacity, resulting in one of the largest European systems if compared to its populations. In terms of policy measures, indeed, Germany opted for strategic virus containment measures, and more limited investments in the expansion of *ICU* capacity. Policymakers decided to heavily invest in digitalization, one of the major critics moved towards the German healthcare sector. The investments in new forms of digital and virtual medicine proved to be extremely efficient in maintaining efficiency in the level of communication within country borders, in the allocation of resources and in the level of patients' care.

In terms of medical equipment, Germany managed to increase the total amount of trades with neighboring countries demonstrating its ability to promptly reallocate resources and inventories to much more needed medical supplies production. The pharmaceutical sector in Germany, in particular, proved to be excessively adaptable and resilient: *PPE*, respiratory and personal-protection devices were consistently supplied to clinics and hospitals.

The rigorous measures enforced by federal authorities, despite being intended to prevent structures from becoming overcrowded, had two major drawbacks: the demanding admission requirements and the relatively lower share of investments devoted to the delicate topic of *humanization of care*, that had a wider relevance in the Italian scenario.

USA faced similar problems, though with more extended implications. Indeed, USA, in the pharmaceutical sector is, simultaneously, one of the largest exporters and one of the largest importers. The bans on exports imposed by other countries seriously impacted the ability of USA of providing needed equipment to workers and patients. Consequently, authorities were forced to adopt a more severe approach on repurposing existing resources towards more incumbent necessities. Moreover, this fact also prompted a reevaluation of business strategies at the federal level, with severe critics moved against authorities and entrepreneurs for the high degree of dependence on external sources. The role of federal institutions, in this context, also extended in creating opportunities for greater cooperation among different states for an equitable distribution of the scarce available resources. The problems, in this context, derived from the characteristics of the system itself: the private nature of the majority of sanitary institutions created a fierce competition in the medical equipment market, with products' prices suddenly rising to ever-reached heights.

The most effective actions undertaken by federal authorities were related to the implementation of the so-called *Defense Production Act*: it guarantees to the central government a broad authority to ensure the timely availability of resources and services. Among the powers to which authorities are granted access, arguably the most strategic, in the pandemic scenario, consisted in the ability of prioritizing and rearranging production lines of private enterprises: in this way, the dependence from external sources was temporarily overcome. However, the “forced cooperation” between public and private was heavily questioned, especially in economic sustainability terms.

Medical structures, on the other hand, suffered from prolonged strains particularly during the first three months of the pandemic. Lately, indeed, the development of alternative methods of treatments, that did not require actual hospital visits and the reinvention of available spaces had a significant impact in fostering efficiency and reducing risks and burden for workers, patients and structures.

Hospital structures, with the cooperation of insurance providers, developed innovative plans of action, through the use of Telemedicine.

The pandemic, as already remarked, induced changes that would have possibly taken more time. Practically, while doctors and professionals were granted safe environment for providing remote prevention activities, patients had at their disposal an alternative, safer, pathway.

4.2.1 – Findings and long-term implications

The most important insight that can be drawn from the previous analysis is extremely concerning: the majority of policies implemented were short-term solutions to potential prolonged problems. Oppositely, the case of Germany demonstrated how substantial investments, ahead of time, might be crucial for providing the same level of quality regardless of the workload.

Indeed, while the choice of adopting short-term solutions is easily understandable and proved to be extremely efficient given the circumstances, the factors that underscored the necessity of these measures are extremely important, considering the potentially catastrophic consequences they could have brought about.

Interestingly, authorities operating on the three healthcare systems opted for similar solutions, in terms of both sanitary structures and supplies management.

The implementation of solutions for containing the burden on medical structures generally consisted of a general reorganization of spaces, in an attempt towards a greater division between pandemic-related and non-pandemic-related conditions, the use of pre-existing structures, in view of extending the available capacity, and the implementation of more stringent policy measures, in terms of non-pandemic diseases admission requirements.

Interestingly, different approaches led to similar outcomes: Italy, given the lowest capacity among the three analyzed countries, decided to temporarily expand its capacity through field hospitals, pre-existing buildings employed for intensive and acute care units, greater cooperation among regional entities and other national authorities, including the military workforce and the navy army. Germany, on the other hand, adopted an aggressive approach in terms of admission requirements and structures management: inpatient clinics started being used for pandemic-specific purposes and urgent treatments, while outpatient clinics and pre-emergency care structures had to manage screening and

testing activities. In conclusion, the US set forth a combination of measures aimed at engaging in new methods of medicine, enlarging available capacity and improving the coordination between different levels.

Similarly, the management of supplies has undergone profound, yet temporary, changes. Indeed, the production lines of the pre-pandemic period proved, at the same time, not to be sufficient and heavily dependent on third-countries imports. Italy and Germany exploited the resources made available by the European initiative known as “Covid-19 Clearing House”, that promoted cooperation, knowledge and resources sharing. USA authorities, on the other hand, made use of the Defense Production Act, forcing, in a sense, cooperation between public institutions and private enterprises. In particular, the latter, following the recommendations of the former, promptly switched and adapted production lines to the pandemic needs. Overall, the pandemic highlighted the need for having emergency inventories, on a larger scale compared to the resources available at the beginning of 2020.

Future challenges will require the implementation of long-term actions, generally aimed at implementing measures in order to build more resilient and sustainable systems. In particular, investments in terms of medical structures and supplies provision should be aimed at the construction of emergency inventories and additional units for facing rapid surge in demand for treatments. On the other hand, the pandemic emergency created the basis for a greater technological integration in the sanitary field: in practice, investments in alternative forms of medicine have already proved to be extremely important in alleviating the burden on existing facilities and may become more widely accepted and used in the future. Moreover, greater international cooperation, not limited to European borders, may be extremely important in terms of innovation and challenges anticipation.

Chapter 5: Drafting future healthcare policies towards greater financial and environmental sustainability

The impact on the pandemic has generated a long series of inquiries that authorities in charge of managing the well-being and the sustainability of their healthcare systems must be prepared to address adequately in the foreseeable future. The conclusions drawn throughout the analysis conducted in chapter two, three and four, indeed, provide useful insights that need a prompt evaluation and, whenever necessary, a defined strategy of action.

Chapter three, in particular, has been devoted to the issues concerning healthcare professionals, their mismanagement, their psychological status and the situation in the medical workforce market. In this specific regard, authorities decided to expand the numbers of employees mainly by retrieving from retirement old personnel: a short-term remedy for a long-lasting problem. Moreover, the initiatives proposed in terms of enhancing the actual capacity of university courses in medicine, although extremely important, represent only a long-term solution, with a forecasted horizon of four to ten years needed before observing significant changes. For this reason, the necessity to identify a medium-term strategy, equally sustainable in a long-run perspective, became essential.

Chapter four, on the other hand, has analyzed the ongoing situation related, under different aspects, to medical structures, where observed implications are inherently correlated. Indeed, the decrease in hospitalization rates for non-Covid-19 patients was made necessary by a series of factors, including the state of obsolescence of sanitary structures of different types. The temporary setup of field hospitals in Italy, despite resulting extremely useful throughout the emergency, cannot be considered effective in a long-term perspective. On the other hand, the German situation, with their consistent strategic investments in facilities, can be deemed as an extremely useful case study for future policies, according to the extremely positive results during the pandemic. The innovations introduced by USA, in conclusion, demonstrate how technologies are going to be bounded with medicine in the future, and offer useful findings on their ability to relax the burden on sanitary structures during emergencies. Moreover, the market for medical resources and equipment, although subject to strict regulatory control by different bodies, has exhibited a series of critical issues: the almost complete absence of inventories to allocate for emergency purposes, the heavy reliance on third parties and the challenges inherent to the pandemic in successfully conducting economic transactions constitute the three main factors that have highlighted the absence of a forward-thinking approach.

The following chapter attempts to identify possible sustainable solution to the above-mentioned issues, providing examples, whenever possible, of healthcare systems around the Globe that have already decided to implement similar solutions, with related results and consequences. Particular attention will be devoted to the sensible topics of financial and environmental sustainability and the possible impact that a greater cooperation between developed and developing countries may have on technology innovation and knowledge sharing.

5.1 – Strengthening Healthcare Workforce: from increased university capacity to incentives for specialization

The potential benefits that investments in education, specialization and coordination of healthcare workforce may create are, in a sense, widely recognized, but no significant variations have taken place in the last years.

The future challenges consist in finding the delicate equilibrium between the extension of the total capacity of the workforce while ensuring greater care towards already-employed personnel.

The reports analyzed in chapter three highlighted the need for establishing safe environments for professionals, where to treat properly eventual psychological diseases. Interestingly, it has been demonstrated (Pappas, 2021) that the adoption of specific behaviors and strategies at the individual and team level may relieve psychological stress on healthcare workers. Among suggested behaviors, recognizing success throughout moments of exhaustion is a way to “*build collective efficacy*”, while leaders must ensure that in the team is shared a common mental model, i.e. a common understanding of the role of each individual and the ultimate scope of the team. Oppositely, policymakers and hospital managers must ensure, whenever possible, continuity among existing teams, as a tool of building common success and resilience.

Moreover, researches (Pappas, 2021) have demonstrated that, in future crises, the most resilient teams can engage in a specific process called “*Minimize, Manage and Mend*”, already carried out in the pandemic by teams that used to work together for at least 2 years. The first aspect consists in being ahead of time, preparing for tough situations through the lessons learnt in the past, the second is related to the actions that must be taken by leadership figures and face challenges as they emerge, while the last consists of actions taken as the stressful situations have been partially or complete overcome.

The enlargement of the capacity of healthcare workers is a long-lasting theme that has never been addressed successfully. In recent years, in all the three analyzed healthcare systems, there have been several proposal concerning the abolishment or, at least, the partial weakening of the existing “*numerus clausus*”. Despite the promising premises, however, the effects of a similar strategy won’t be seen before a period of at least four years. The implications of a similar strategy, moreover, are wider than generally understood: as soon as newly-graduated professionals will be ready for intensive training, additional investments must be carried out, in terms of resources, personnel salaries and supplies.

Another solution, that might give anticipated results with respect to the enlargement or the abolishment of the *numerus clausus*, consists in providing financial benefits to students who decide to invest additional years of specialization and training into medical areas with severe shortages of personnel, including, but not limited to, pneumology, primary care and cardiology. Financial support, in this context, may take various shapes: salary rises, tuition assistance or scholarships and grants, ultimately leading to a specialized roster of professionals who are highly motivated to perform well in their fields. In this sense, the role of authorities must be targeted towards the assessment of high-demand medical areas, trying to align medical needs to students’ interests. The implications, in this sense, can actually extend beyond the actual sanitary needs, but they can actually play a strategic role in distributing healthcare personnel effectively also from a geographical perspective, and this can be extremely useful for lower- and middle-income countries.

In this sense, policymakers may also decide to engage in activities aimed at fostering greater cooperation among countries and across institutions coming from different levels. Practically, global

institutions, such as *ONU*²¹, may promote the construction of global processes for workers' licensure procedures.

The harmonization of the above-mentioned procedures, indeed, may contribute to enhancing trends in terms of labor movements, that, in turn, may result in greater knowledge sharing across different medical domains and geographical areas. Moreover, in times of emergency, similar strategies may facilitate the deployment and transfer of workforce towards endangered areas. In conclusion, also healthcare workers can possibly benefit from the establishment of common licensing procedures: they would be granted access to a wider range of opportunities, beyond national borders.

In the future, moreover, the possibility of creating a more dynamic working environment can be created through innovative multidisciplinary training programs: the consequences, in this sense, might have a dualfold interpretation. Firstly, healthcare workers would gain access to a greater spectrum of skills, enjoying the opportunity of working in close contact with specialized personnel from different, possibly distant, medical domains. Secondly, it facilitates the sharing of information and knowledge, fostering increased communication.

5.2 – Transforming Medical Structures: enhancing specialization, quality and technologies

Medical structures have been, in the majority of the situations, drastically overwhelmed by the outbreak of the pandemic, leaving the general public with unanswered questions. Claiming that problems are related only to capacities and organization of spaces leads to a strong underestimation of the other problems that impinge upon hodiern structures.

Indeed, issues are not limited to the management of existing spaces, but are also related to the level of the quality of care and to the technologies available for patients' treatments. The pandemic, in a sense, has helped in speeding the process towards a greater presence of telemedicine and other forms of alternative medicine in the provision of treatments. The positive aspect of innovations, in this sense, is that they offer a "low-resource alternative" (Jin, Kim, Miller, Behari, & Correa, 2020), useful for providing a greater amount of treatments, specifically in regard to citizens who are not able to move physically towards sanitary structures. However, despite the important impact it had during pandemic phases, much skepticism still surrounds their implementation for a wider scope, with the main cause being the altered relationship between patients and professionals. Moreover, the existing skepticism, on the workers' side, relies on the fact that they consider more difficult the provision of the existing services with a similar level of quality and the influence on ethics considerations (safety and privacy). However, despite the presence of unresolved issues and the need for further considerations, an efficient use of these innovative technologies may channel future patients towards specialized structures without having to recur to scanning and testing activities, consequently lowering costs for structures and patients.

Moreover, the pandemic created severe financial implications for actual structures: the need to respect planned budget constraints has been predicted to oblige more advanced structures to engage in high-value and more complex, but low volume, transactions (Ribera, Antoja, Rosenmoller, & Borrás,

²¹ Organisation des Nations Unies

2016). The pre-pandemic period saw the major healthcare institutions opting for efficiency improvements, which led to smaller and less frequent investments and reduction in volumes of activities and treatments. On the other hand, minor treatments and services will follow the opposite path: allocated to other healthcare providers, such as outpatient clinics in Germany.

While many criticism have been raised, the choice may result to be extremely efficient, under one specific conditions: greater investments in smaller structures, increases in volumes of treatments and in capacities. Stated differently, a different approach may lead to greater efficiency and effectiveness in treatments and workloads managements. The different approach consists, in a sense, of a reorganization of duties and responsibilities, rather than a reorganization of existing spaces, which proved to be a short-term solution in pandemic times.

A change in this direction has also profound implications for the development of technologies in medicine: leading hospitals would also be leading innovation processes, experimenting new techniques and methods, not only in terms of treatments, but also for patients' and workloads management.

The Italian and German healthcare systems, in pre-pandemic times, have often been criticized for being overly doctor-centered. Future changes may imply that, while providing hospitals with new specialized professional figures, for specific tratments and equipe management, patients might start to be involved in the personalization of their own services, engaging in more quality-driven changes, often missing in the latest periods.

In conclusion, a different approach, already partially implemented by the *Karolinska University Hospital* in Stockholm and by the *Hospital Clinic of Barcelona*, may be the final answer to pandemic-raised issues. The mentioned process follows different principles: efficiency, quality and constant improvement. Efficiency for clearly establishing different levels of hospital care, quality in terms of treatments and accessibility and, lastly, constant improvement of structures, techniques and management. To a certain extent, hospitals would closely resemble major enterprises, channeling resource where needed, avoiding wastes and prioritizing quality of services and, in a sense, "patients' experiences". Healthcare systems, following these lines, are predicted to become more financially sustainable, providing greater safety and equality. Possible drawbacks come from the applications of the above-mentioned principles in situations of healthcare systems not providing universal coverage. In other words, Italy, whose sanitary sector has principles and a theoretical structure extremely close to the Swedish and the Spanish systems may find less difficulties in adapting its system to the above-mentioned recommendations, while the situation for Germany and the USA needs further examinations.

5.3 – Managing healthcare supplies: the introduction of a “Clearing House” at the World Level

The Covid-19 Clearing House has been extremely useful for the management of healthcare supplies in Europe throughout the period between April 2020 and September 2020. This temporary device proved extremely strategic for overcoming the hardest phases of the ongoing public health crisis, ensuring great cooperation between Member States and other institutions. Practically, it consisted of a platform of resources and knowledge sharing, alongside economic support tools.

This strategy, however, not only remained active only temporarily, but also, being an European mechanism, excluded other major participants in the global economy, renouncing at the possibility of obtaining additional sources of expertise and production lines, and was, to a certain extent, dependent on the decisions on exports and imports from third parties. Stated differently, the potential of this mechanism has not been exploited completely.

Ideally, the establishment of such a perpetual, centralized and, presumably, independent platform, not linked to any economic responsibilities, might represent an opportunity for collaboration on a global perspective. The implications are not only related to the transmission of expertise, resources and real-time data, but also in terms of ensuring an equitable distribution of products, including towards lower-income countries. Moreover, a similar mechanism is likely to create grounds for a greater environmental sustainability: knowledge-sharing is likely to minimize the waste of resources and create more efficiency in their utilization.

The centralization of responsibilities in an unique body would facilitate and incentivize the creation of emergency resources inventories, ensuring preparedness and efficient management under extreme conditions.

The economic consequences on the market for sanitary supplies, regardless of the non-economic nature of the platform, are probably going to be enormous: sharing raw materials, expertise and final products is likely to destroy the existing levels of competition, presumably bringing the market to a condition close to a perfect competition, without opportunities for outsourcing resources to developing countries, a repeated phenomenon, as showed by the pandemic. This factor may have severe consequences for the final success of the project, because major private enterprises involved in the industry may lose their own shares and related profit opportunities. Transferring ownerships to public institutions is a possible, though difficult, solution.

Indeed, pre-existent risks are likely to create severe obstacles to the establishment of a similar institution. Indeed, this project would require complete transparency in data, production mechanisms and knowledge; aspects that are likely to be considered as extremely harmful by certain countries. Similarly, the cooperation imposed in this sense might exacerbate existing political tensions.

Conclusions

The comprehensive analysis of the Covid-19 impact on the healthcare systems of Italy, Germany and USA, introduced by a detailed description of their main characteristics, highlighted important conclusions that might be crucial for the definition of future healthcare policies at the national and international perspective.

Indeed, future policies should be inclusive and aimed at addressing pre-pandemic flaws as well as the consequences of the pandemic itself. The main areas to target should be, accordingly with the core of the thesis, the psychological and physical burden on healthcare workers, the construction of additional capacity in terms of hospitals and sanitary supplies. The analyzed areas, indeed, showed different problems with similar roots: mismanagement at the national or federal level and lacks of technological progress and capacities.

Solutions, in this sense, must be, at the same time, readily applicable and sustainable in a future perspective. Indeed, policymakers might decide to develop a strategic line of thought, ensuring the development of immediate capacity, while being supplemented by medium to long-term solutions, that should foster improvements in existing technologies and efficiencies.

The solutions, presented in chapter five, that have the objective of strengthening available healthcare workforce while building additional capacity can be considered extremely balanced between short-term and long-term horizon: providing economic incentives for employed professionals while investing on academic career paths in medical areas, in view of making them more interesting and accessible to students.

Existing structures can be improved enhancing specialization and quality of treatments, while creating the foundations for new, innovative and more technological structures. In this sense, the fact that quality has been considered the first target area might sound in contrast with the main issue that impinges upon all the analyzed systems: the need of building additional capacity. However, similarly to what has been recommended in the case of healthcare workforce, the construction of additional capacity, especially in terms of hospitals, is inevitably a feasible solution exclusively in the long-term perspective. Investments in quality, specialization and technologies, in this area, might serve as a “*safety net*” for policymakers, granting them enough time to eventually define more complex investments, and their economic and legal implications.

Lastly, the introduction of a *Clearing House* for medical supplies at the world level, a perpetually-active institution, comes with important difficulties, but might be extremely beneficial in terms of equity and expertise. Moreover, with the cooperation of globally-active organization, the establishment process can be facilitated, ultimately leading to a solution which might be immediately effective.

The above-mentioned recommendations, and the cross-country comparison which characterizes the thesis, implicitly highlight the main conclusion of the whole thesis: the necessity of fostering greater international cooperation, on a regular basis. The pandemic, in this sense, helped: for instance, since the first months of the pandemic, when other Countries, European and non-European, had not been severely affected yet, Italy received substantial aids.

The problem is that, inevitably, when a global emergence arises, Countries might be forced to devote available resources within their own borders. The *Clearing Mechanism* and regular cooperation might

be extremely useful for geographically-restricted situations and for preventing or, at least, reducing the impact of global emergencies

In conclusion, in an historical period characterized by ever-reached heights of integration and globalization, with societies and economies still dealing with the consequences of the pandemic, the imperative of building sustainable, resilient and equitable healthcare systems becomes even more important. Therefore, despite the challenges that the future poses, solutions can be found and implemented, by means of cooperation, innovation and specialization.

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