Daniela La Foresta
Anna Dziadkiewicz

# Health planning and crisis management

## during the first wave of the pandemic

The case of Italy and Poland
- comparative study

riep

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# CONTENTS

# FIGURES

# PICTURES

# TABLES

# INTRODUCTION

The COVID-19 pandemic has caused an unprecedented global public health crisis. The synergy between numerous factors, including the relative ease of SARS-CoV-2 transmission, the inability to identify and contain the first COVID-19 outbreaks, as well as the difficulty in balancing the political-economic aspects with public health, has greatly shaken the world's order, impacting various domains: starting with health and work, ending with global chains and the distribution of power.

The pandemic, although a sort of shock to the world, cannot be considered an unforeseen phenomenon. The previous crises, attributable to SARS, H1N1, Ebola, and MERS, as well as the industry experts had long highlighted the risks of such an event and the need to implement measures to contain and mitigate the associated effects. Yet, these warnings went largely unheeded and the world was not ready to react effectively.

In the upcoming months, after the terrible experience with the new virus, the world will have to restructure its approach towards the protection and promotion of health. Without such a shift, global recovery from the COVID-19 crisis will remain weak, with fragile domestic and international public healthcare systems serving as shields.

This research was of problem-oriented nature and was conducted in order to understand the exact issue, which has affected the world globally, contributing to the failure of the economic systems

of many countries, the tragedies of countless families, the bankruptcies of many companies or the need to change the business models and the worldwide approach to private and professional life.

Since the study has been written by two Authors representing completely different research areas: Daniela La Foresta - geography, Anna Dziadkiewicz - management and quality science, different views on the same issues have been presented. In the first part, more emphasis has been put on the political and legal aspects, in the second part - on the economic and social challenges. The work has therefore been divided into two parts: a description of the situation during the first wave of the pandemic in Italy and Poland, with particular emphasis on the political, the legal, the economic and the social issues.

In the 'Italian' part, the spread of the SARS-CoV-2 virus in the first months since the beginning of the outbreak was analyzed. Regions and provinces were compared in terms of territorial immunity to the virus. Statistics are also presented on the mobility of Italian citizens during the state of emergency and the resulting threats observed in major urban centers. The following section presents the national healthcare system and the Italian public healthcare model. In the last chapter of this section, contextual factors are indicated, especially the socio-demographic perspective.

The second part of the study is, in a way, a reflection of the issues discussed, but presented on the example of Poland. The Poles' knowledge and preparation before the outbreak of the pandemic has been indicated. Next, the activities of the Polish services during the state of epidemic threat have been outlined. The first chapter has been concluded with a presentation of the stages of the restriction lifting and a broad description of one of the most threatened Polish regions - Silesia. The factors analyzed here are pertain to the much higher number of infection and death cases than in other regions of Poland.

The next chapter presents the Polish health information system and the indicators used by the healthcare system in relation to epidemiological situations.

The last chapter analyzes the Poles' attitudes towards the pandemic, in the socio-cultural and the economic context. The role of the social media, as the most popular form of communication during the pandemic, has also been extensively described. To conclude, inferences were made about the challenges to be faced by Poles and the Polish healthcare system in the inevitable second wave of the coronavirus.

This change of approach assumes a thorough understanding of what has happened. This work aims to evaluate, through a territorial comparison of two European countries, i.e. Poland and Italy, the impact of the law enforcement policies, the social attitudes, as well as the ways of dealing with the crisis with regard to different spheres of life – economic, educational, medical, cultural and worldview. From this perspective, the territorial response to the health crisis as well as the effectiveness of the different health planning models implemented in various regions were the subject of analysis.

The timing of the decisions made resulted in violation of the rules and new distribution of power. Many of these innovations addressed the acute phase of the crisis only, yet some of these changes will continue. Humanity has suffered and faced numerous states of epidemic, which often changed the course of events, not always with negative impact. These effects are indeed often positive, in terms of invalidating the existing conventions as well as in the field of scientific innovation, human solidarity, economic and social progress.

# PART I

# Covid-19: the case of Italy

*Daniela La Foresta*

CHAPTER 1

# The Covid-19 pandemic in Italy. Regional comparison

## INTRODUCTION

On 8 March 2020, pursuant to a decree of the Prime Minister, Italy enacted first restrictive measures in attempt to contain the spread of the coronavirus. Only essential services remained operational. The following day, the World Health Organization announced a global pandemic. The first coronavirus cases were recorded in the second half of February, in two small municipalities in the Lombardy region: Codogno and Vo Euganeo. From that moment on, each Italian region introduced uncoordinated and inhomogeneous policies that had various impact on these territories, sometimes mild, other times disastrous, as in the well-known case of Lombardy.

Data analysis, in numerical terms, is the first step in the full understanding of such critical events as the Covid-19 outbreak. This section aims to help understand the effectiveness of the restrictive measures implemented by the Italian government, starting with the trend of the coronavirus epidemic curve, as well as to analyze

the regional outcomes and differences. The analysis was carried out based on the data collected by the Department of Civil Protection, regarding each Italian region, which only gives an impression of the real national contagion, since the spread of the virus most certainly was much wider (considering the high number of asymptomatic cases). Almost all the data analyzed in this report refers to the time frame of March 8 - May 31, 2020.

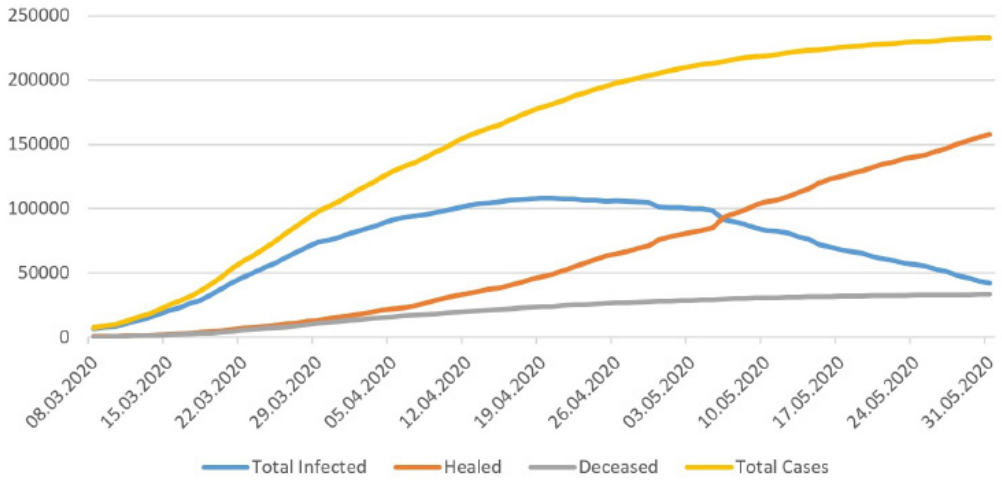
## THE SPREAD OF CONTAGION

To introduce this analysis, by providing a clear and comprehensive picture of the epidemic, it is necessary to begin with the general number of infections and number of the cured, the mortality rate and the number of new coronavirus cases. Interestingly, the slope of the cured/discharged curve and the daily number of diagnosed coronavirus cases arched positively in the last weeks under analysis, whereas the number of coronavirus cases (at the time as well as in total) reached its peak on April 19 (108253 cases), followed by a sharp decline (Figure 1 and 2).

To better illustrate the trend in the number of new coronavirus cases and the impact of the restrictive policies implemented, the percentage increase in the number of cases, against the background of the data for preceding days, was graphed (Figure 3). Figure 3 presents the analysis of how the daily increase in the total number of cases, in percentage terms, varies, which it is extremely explanatory: considering the moving average (the red line). It is clearly visible by how much the epidemiological trend was decreasing just few days after the beginning of the lockdown (the blue bar).

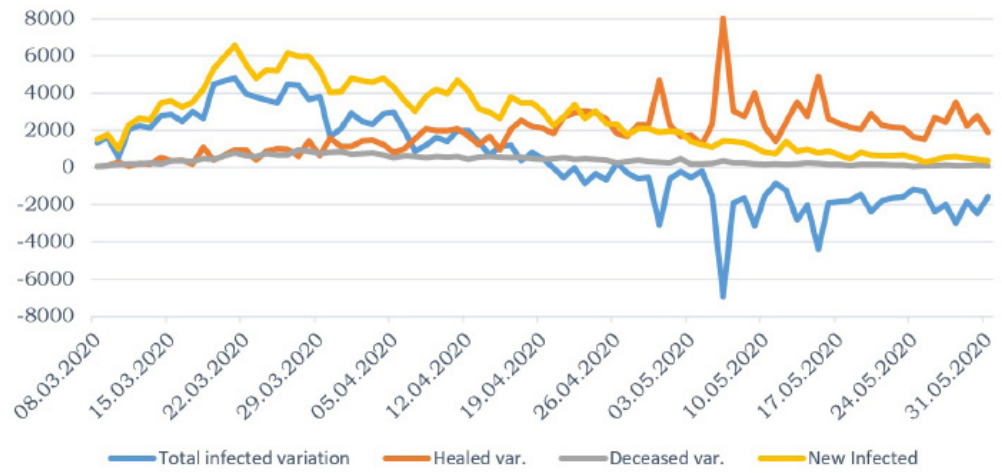
Positive effects of the restrictive measures introduced were also recorded when the infection trend, measured by the number of new coronavirus cases, was assessed, with respect to the number of the swab tests done. Also in this case, even if the trend was less linear, considering the lower Sunday number of the swabs, after

*Figure 1.* **The number of current coronavirus cases, the cured, the deceased and the total number of cases, from March 8 to May 31, 2020**



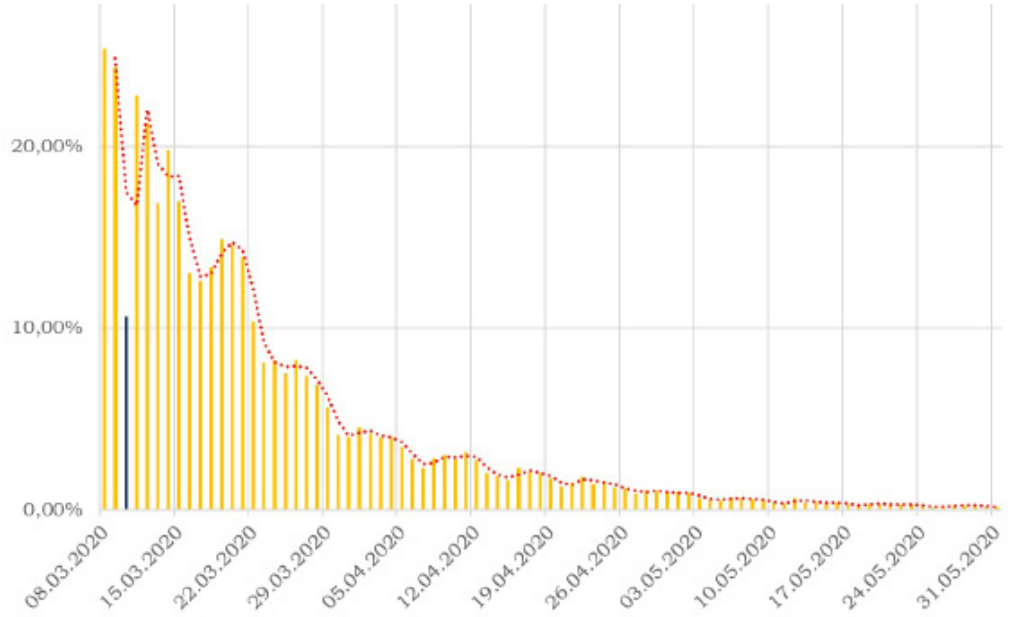

*Source:* Own elaboration based on the data collected by the Department of Civil Protection.

*Figure 2.* **Daily number of current coronavirus cases, the cured, the deceased and the total number of cases, from March 8 to May 31, 2020**




*Source:* Own elaboration based on the data collected by the Department of Civil Protection.

*Figure 3.* **Daily percentage variation of coronavirus cases from March 8 to May 31, 2020**



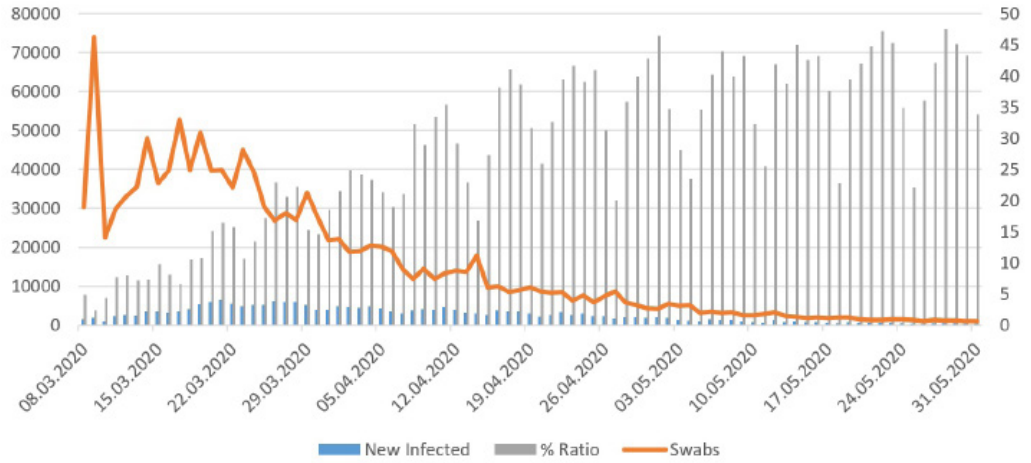

*Source:* Own elaboration based on the data collected by the Department of Civil Protection.

the strong decrease in the percentage values, the 'improvement' in the number of Covid-19 cases was highlighted once again, taking into account the fact that on May 31st, the percentage of positive cases, out of the total number of swabs, was around 0.65%, against the 46.20% on March 9th. (Figure 4).

Although the number of coronavirus cases was a value often criticized and replaced by the number of the deceased, which is considered a more reliable data, the research and the insights on it allowed demonstration of how closely, on different time scales, the two values are interconnected and therefore are of relatively equal reliability. Figure 5 presents the quantities of positive coronavirus cases (starting March 8, 2020) and the deaths that occurred 6 days after a given date (starting March 14, 2020). In this regard, the number of deaths on a given day amounts to a seventh

of the cases recorded 6 days before that date. The perfect correlation of the two curves is constant for the entire duration of the lockdown, as demonstrated by the values of this index.

*Figure 4.* **Daily number of swabs and the number of new coronavirus cases, from March 8 to May 31, 2020**

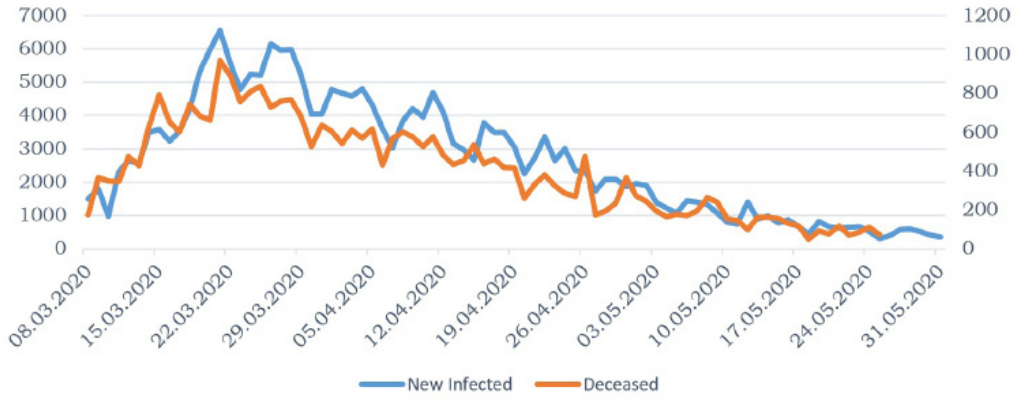



*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

In addition to the number of coronavirus cases and the number of deaths, the number of hospitalizations and intensive care unit (ICU) cases is an even more reliable indicator. This is because the number of deaths, while being highly indicative, in many cases concerns the people hospitalized days or weeks before, and therefore a time lag must be taken into consideration as well. As such, the following two Figures (6 and 7) present the number of the patients admitted to intensive care units, the number of hospitalized persons and those at home quarantine. The general trend of the load on the Italian healthcare system (Figure 6) clearly is more explanatory, while the curve in Figure 7 allows indication of the exact moment of the trend change, more or less a month after the be-

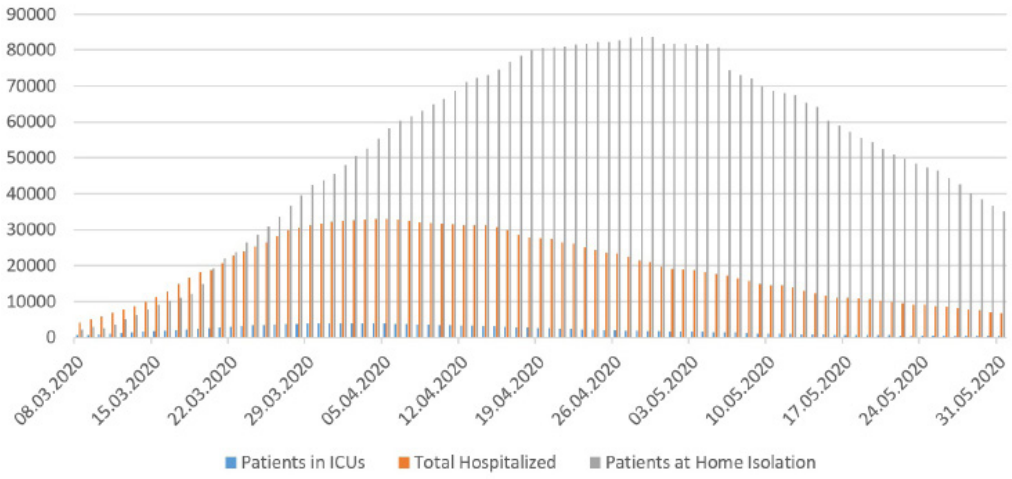
ginning of the lockdown (negative values of inpatients and ICU admissions).

*Figure 5.* **New coronavirus cases vs. the number of deaths 7 days later**



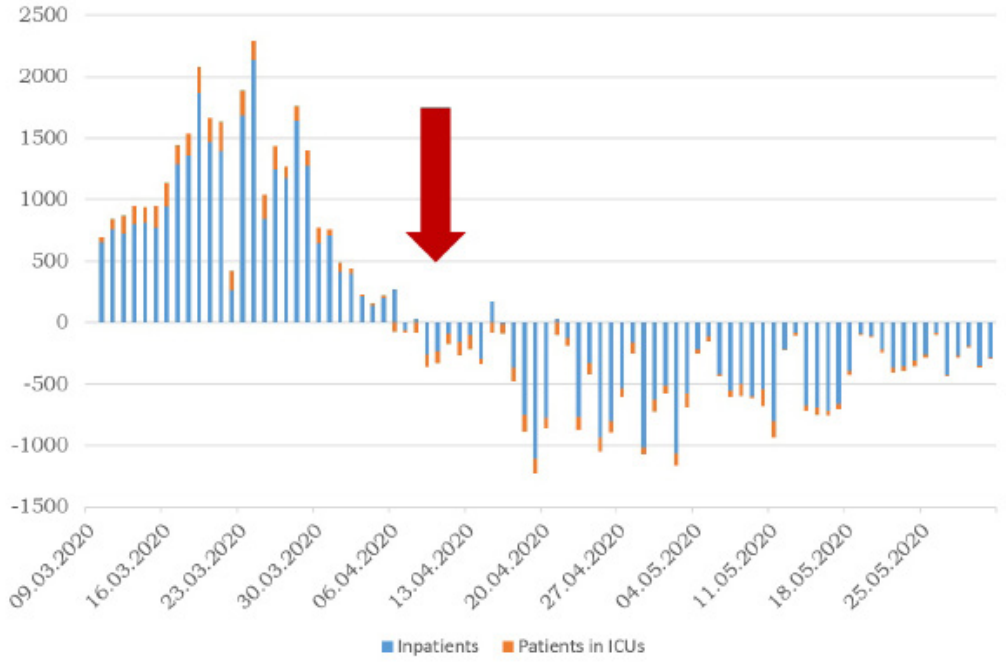

*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

*Figure 6.* **The trend in the number of ICU patients, inpatient and home quarantine cases**




*Source*: Own elaboration based on the data collected by the Department of Civil Protection

*Figure 7.* **Daily number of inpatient and ICU cases**



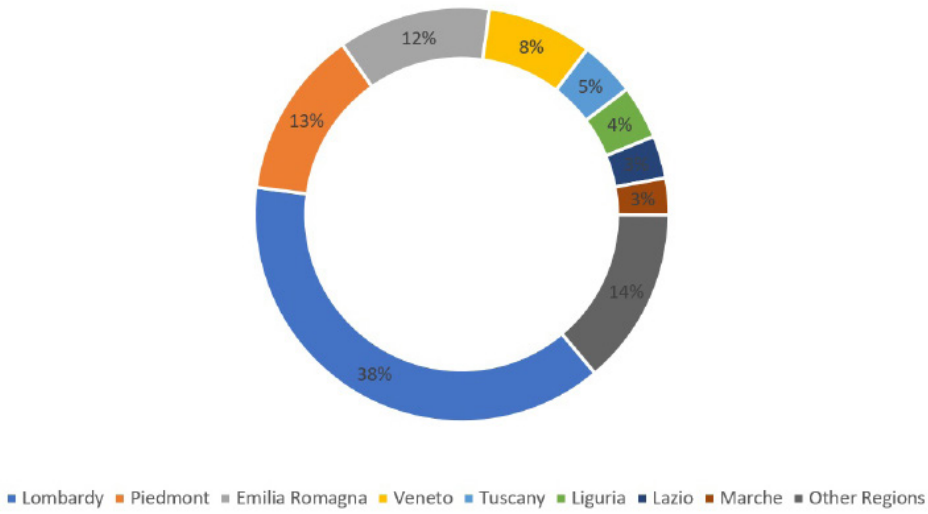

*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

## REGIONAL AND PROVINCE COMPARISON OF TERRITORIAL RESILIENCE TO THE VIRUS

Expansion of the study onto a regional scale has enriched the insight on the issue, adding additional cognitive elements. The Italian public healthcare service, established in 1978 based on the English and the Swedish models, has a decentralized configuration, favoring regional-government bodies. Pursuant to the constitution, with its subsequent amendments which have accentuated the aspects of federalism, the Italian public healthcare system is based on a division of powers between the State, which since 2001 has been responsible for defining the essential healthcare services that must be offered to all citizens, regardless their residence, and the re-

gions that have almost exclusive responsibility for the organization and management of healthcare. The financing of the essential levels of healthcare has remained the task of the State, which allocates financial resources from its budget to the regions, according to the per capita needs and equalization criteria. The choices and the investments of the national and the regional systems are without impact, whereas the divergence of regional policies has revealed itself in all its gravity, through the different reaction capacity of the various regions of northern Italy, i.e. those most affected by the pandemic. Analyzing the regional distribution of the pandemic indicators (Figure 8), it is clearly visible how much the northern regions (Lombardy, Emilia-Romagna, Piedmont, Tuscany and Veneto) were affected.

*Figure 8.* **Geographical nationwide distribution of COVID-19 cases**

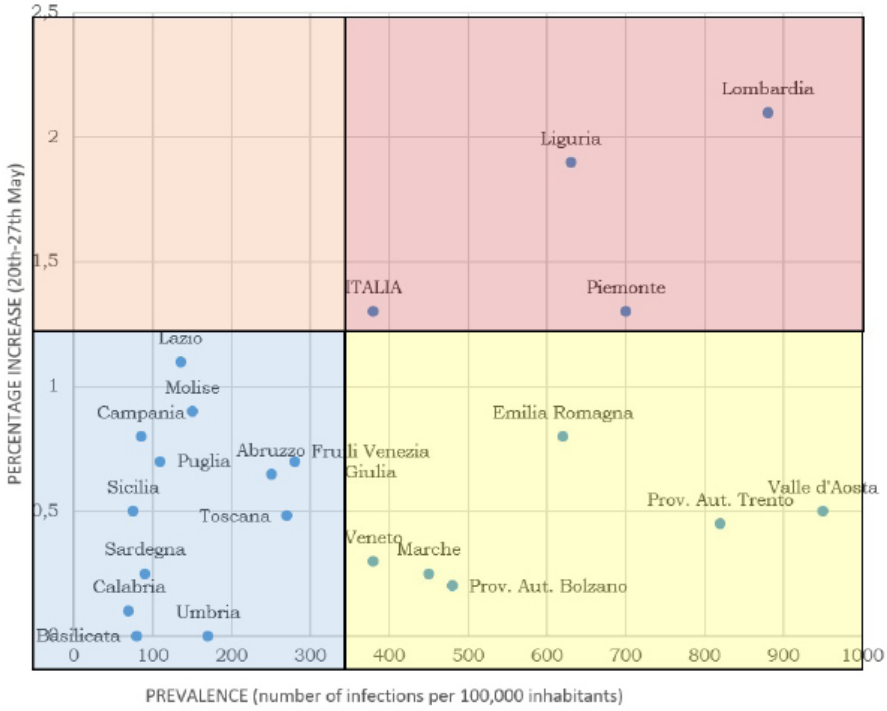



*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

Conversely, the central and the southern regions were less affected by the virus. This trend is also visible when comparing the data on the prevalence values (the number of infections per 100 000 inhabitants) and the percentage increase in COVID-19 cases.

Lombardy is also an outlier here, both with respect to the nationwide epidemiological trend and in comparison with the affected northern regions. This trend has significantly contributed to the position of Italy in global rankings (Figure 9 and Figure 10).

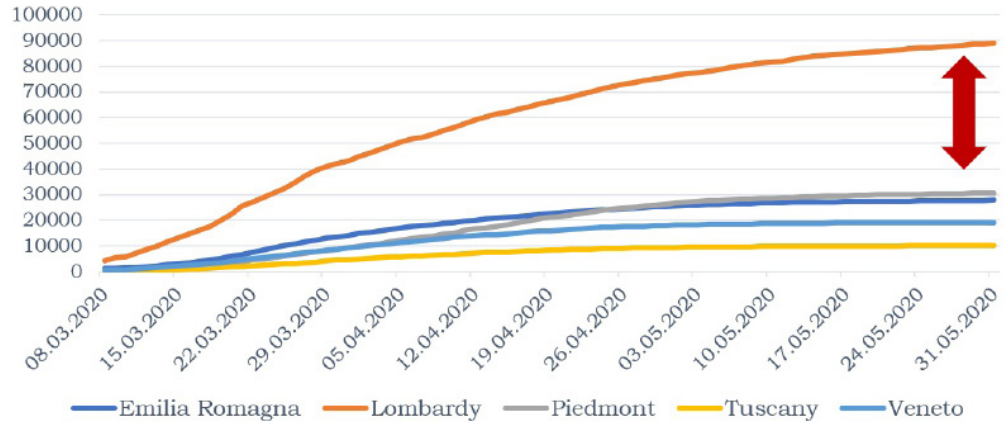
*Figure 9.* **COVID-19 prevalence and the percentage increase of confirmed cases**




*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

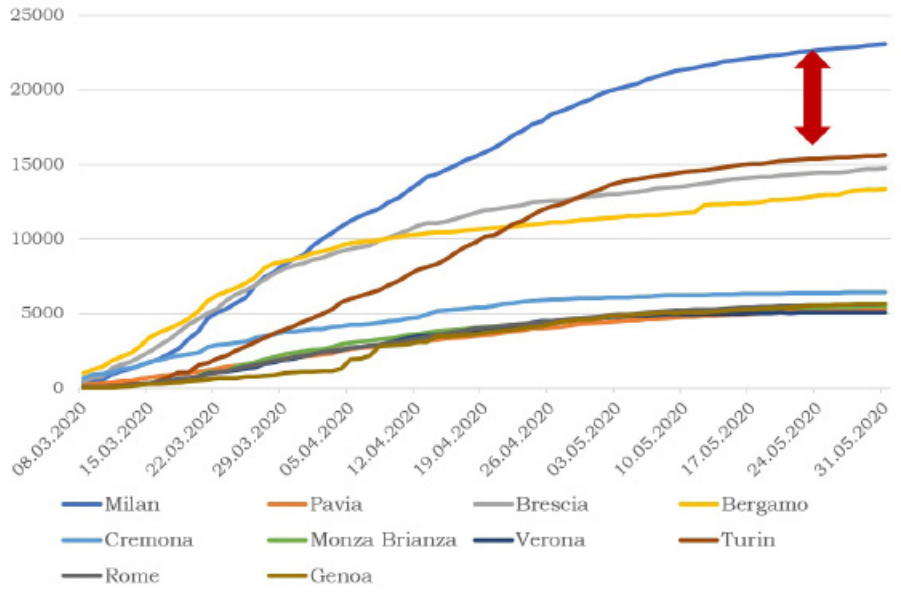
Interestingly, out of the 10 most affected Italian provinces 9 were in the north of Italy, including 6 in Lombardy (Figure 11).

*Figure 10.* **The trend in the five regions with the highest number of coronavirus cases**




*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

*Figure 11.* **The trend in the provinces with the highest number of coronavirus cases**

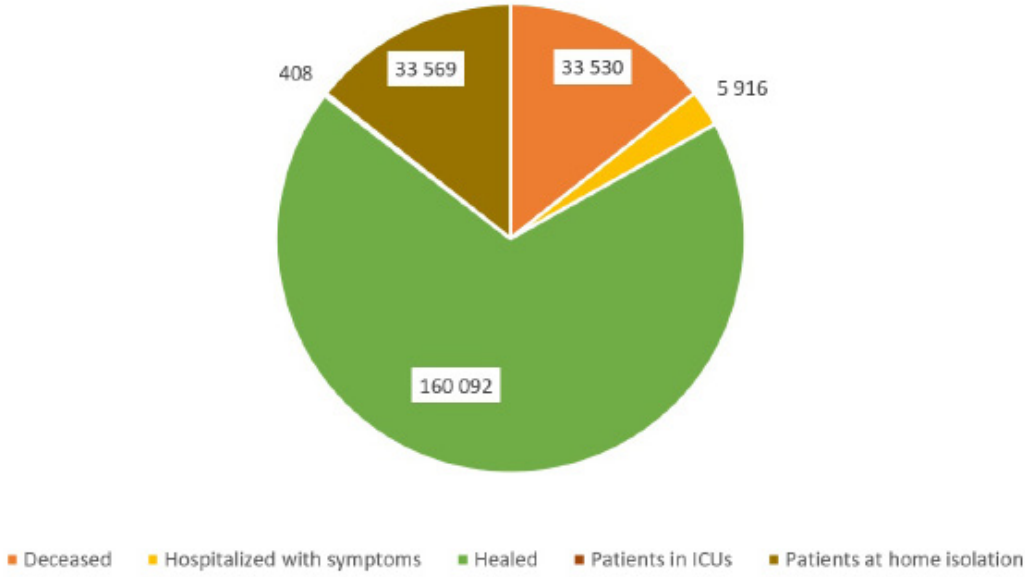



*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

Summing up the state of emergency in Italy (Figure 12), the following values from June 3, 2020, provide a better understanding of the situation: deaths: 33530; ICU admissions: 408; symptomatic hospitalized cases: 5916; home quarantine: 33569; cured: 160092.

Analyzing the numerical data, it is clear that after nearly 3 months of lockdown, the critical phase of the Covid-19 epidemic ceased. Nevertheless, given the clear difference, , in terms of the number of coronavirus cases, between the north and the south of the country as well as the ease of the virus spread and contraction, it is necessary to continue constant monitoring of the virus permanence index and maintain the measures of infection control.

*Figure 12.* **COVID-19 cases, as of June 3, 2020: the number of quarantined, hospitalized, recovered and deceased patients**




*Source*: Own elaboration based on the data collected by the Department of Civil Protection.

# URBAN MOBILITY DURING THE STATE OF EMERGENCY

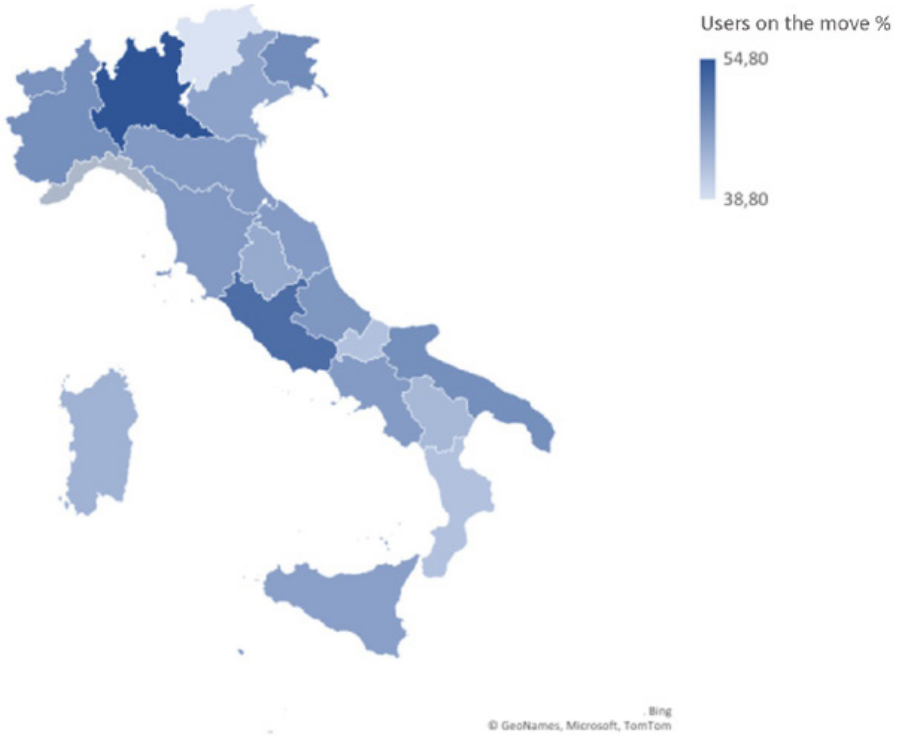
One of the socio-emotional dimensions of human behavior which was most restricted by the lockdown was the freedom of movement. Mobility was affected by the suspension of all unnecessary activities, but also by the urgency to contain the coronavirus, which spreads easily in crowded places.

Analysis of the data on the mobility during the lockdown helps understand the difference in the levels of the restrictions implemented by regional governments, by supplying additional information on the reasons behind the different reactions to the pandemic, in regional terms. The study was carried out using the georeferencing data acquired from the City Analytics tool created by Enel X. The data was analyzed and cross-referenced, which allowed exploration of the flows in the places of interest (POIs) adopted as the sample. The above geographical representation (Picture 1) clearly shows that the region with the highest mobility rate, at the time of the first Decree of the President of the Council of Ministers (DPCM), is Lombardy, with the rate of 54.80%, followed by Lazio (52.0%), Puglia (48.20%) and Trentino Alto-Adige (38.8%).

Given the high concentration of production activity and the resulting permission to travel, many of the people in that region did not stay home. Such varying level of mobility in the region can thus be linked to its economic structure, which largely contributes to the generation of the country's GDP and the consequent pressure exerted on the politicians by the business sector, which in turn not only affected the delay in the adoption of restrictive measures but helped maintain certain production activities. Conversely, in the country's capital, the mobility recorded during the lockdown is attributable to the presence of the supervisory offices, which maintained a minimum level of activity, unlike the other regions, such as Trentino, which, ipso facto, was moving towards internal lockdown.

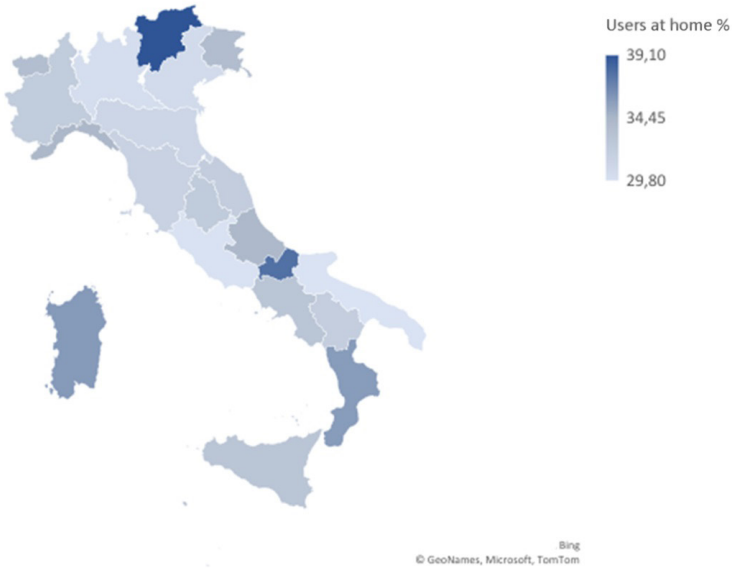
Analyzing at mobility data (Picture 2) in more detail, it can be seen that the average percentage of the persons who stayed at home during March 18-25 is 34.45%. The regions with the highest number of stationary subjects are Trentino Alto-Adige (39.10%), Molise (37.80%), Sardinia (35.90%) and Calabria (35.80%). The lowest value of the index was recorded for the regions of Lombardy, Lazio and Apulia.

*Picture 1.* **Analysis of regional COVID-19 mobility during 5 working days prior to March 25, 2020 – the beginning of complete lockdown: moving subjects (%)**




*Source*: Own elaboration based on City Analytics Enel X, (City Analytics Enel X, 2020).

*Picture 2.* **Analysis of regional COVID-19 mobility during 5 working days prior to March 25, 2020 – the beginning of complete lockdown: stationary subjects (%)**



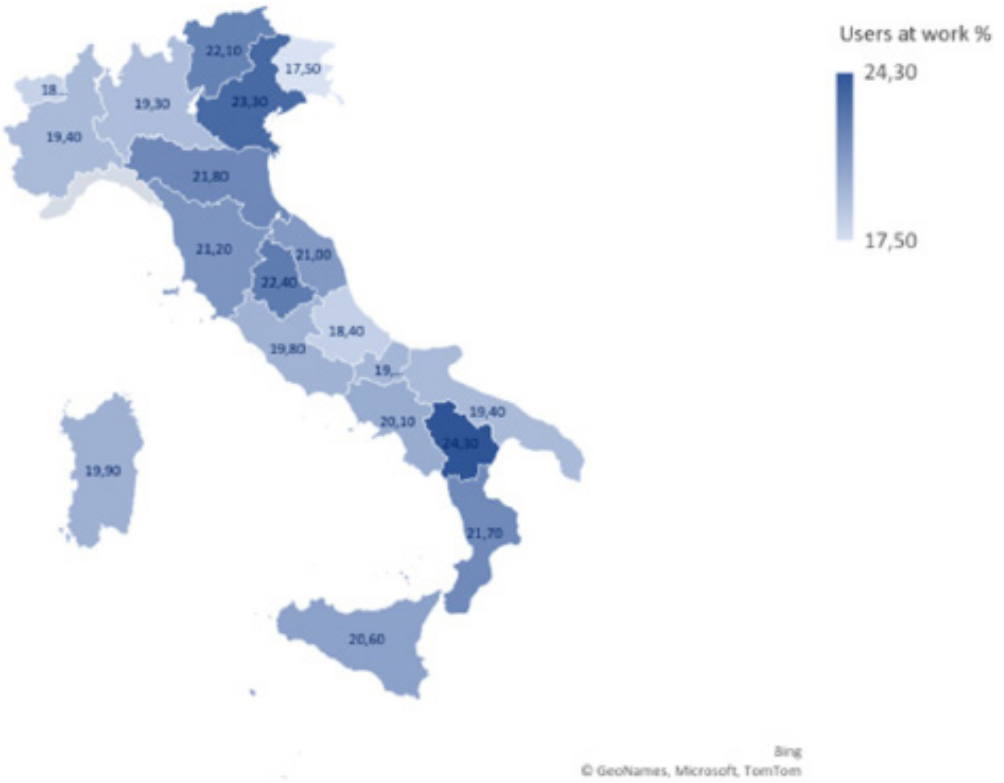

*Source*: Own elaboration based on City Analytics Enel X, (City Analytics Enel X, 2020).

Lombardy reduced its mobility by 53.9%, whereas 77.2% of the workers did not travel to their workplace, staying at home and taking advantage of the smart working model. Only 19.3% of the subjects in that region worked at offices or factories. As such, takin into account only the workers, not the entire population, 55% did not go back to working at an office (Picture 3).

When 19.8% of the Lazio workers still went to work during the period under consideration, in Rome this percentage rose to 20%. 30% of workplaces in Rome ceased their activity and 50% of the workers in the country's capital did not go back to working at their workplace (a percentage similar to that of Milan). In short, as of September 2020, since the period under analysis, 68% of Italian workers did resume working at their workplace. On average, only 21% of the subjects continued to go to work, out of necessity.

Such situation was only possible owing to the cooperation of the Minister of Health and the Minister of Internal Affair, through an ordinance that prohibited all persons from traveling outside the Municipality of their current residence via public or private means of transport, except for proven work-related needs or health-related urgency.

*Picture 3.* **Analysis of regional COVID-19 mobility during 5 working days prior March 25 – the beginning of complete lockdown: subjects at workplace (%)**

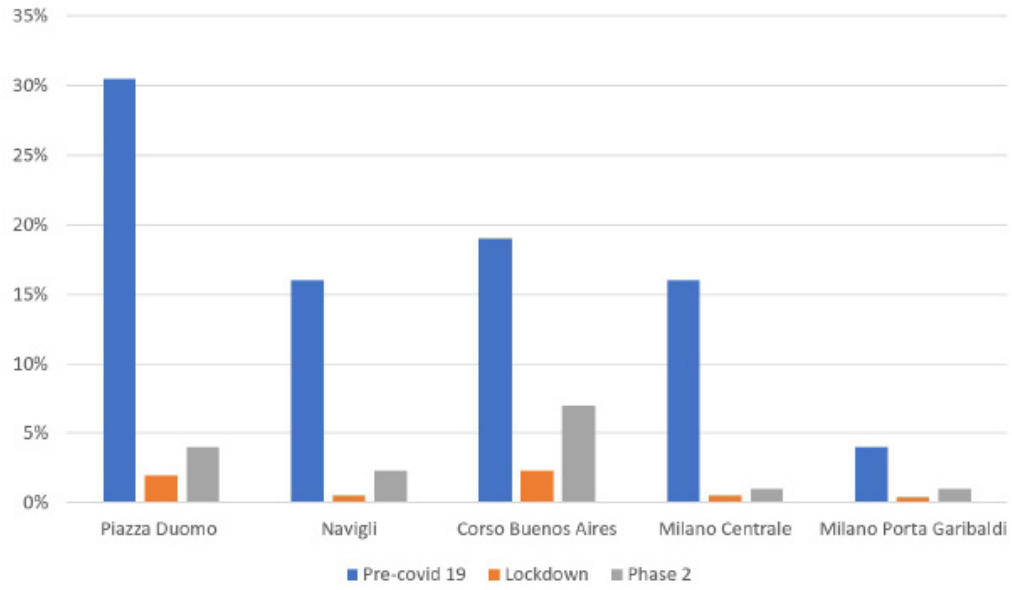



*Source*: Own elaboration based on City Analytics Enel X, (City Analytics Enel X, 2020).

## THE STATE-OF-EMERGENCY PHASES AND MOBILITY IN THE MAIN CITY CENTERS

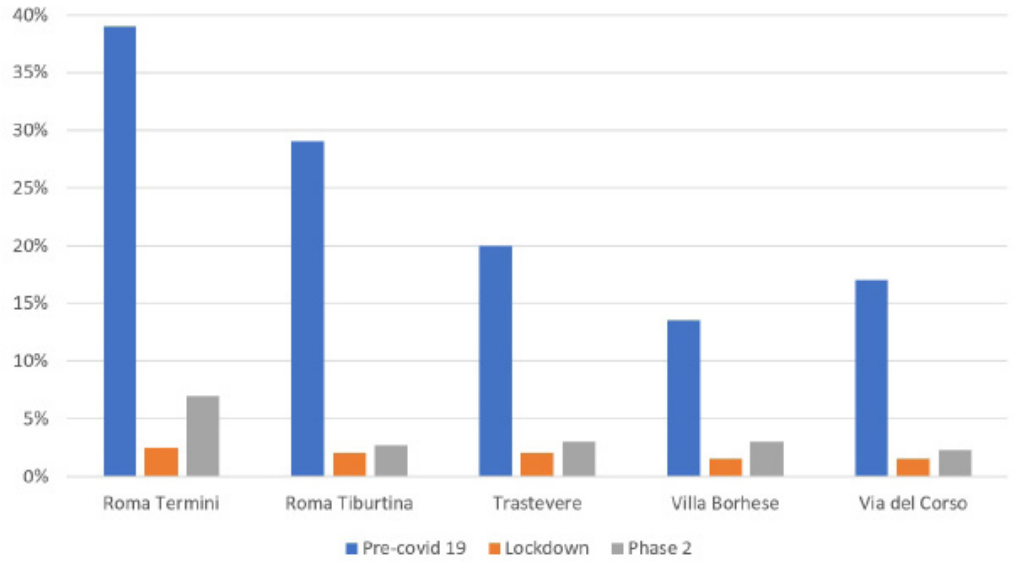
Analyzing the three main phases of the state of emergency (Pre-Covid19, Lockdown, Phase 2), with regard to the mobility at various types of points of interest (POIs) in the main Italian cities (Milan, Rome and Naples), based on data per 10 000 inhabitants, the number of the subjects at selected IPOs could be determined. The phases were divided as follows: the Pre-Covid19 phase (February 8 – February 24), the last week of lockdown (March 26 – May 3), and the first week of Phase 2 (May 4 – May 17), by comparison of the average daily percentages of visitors in Milan, Rome and Naples (Figure 13-15).

*Figure 13.* **Milan - daily average number of POI visitors**



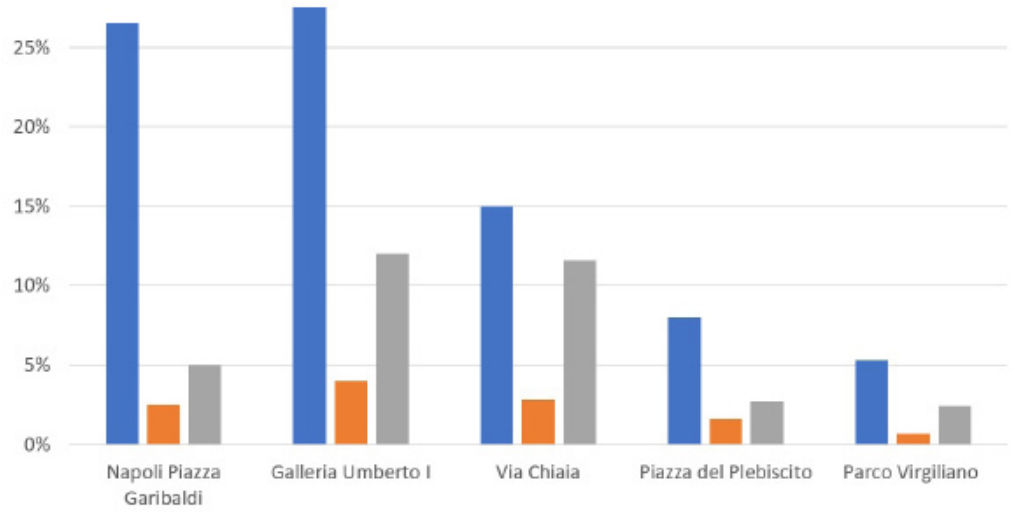

*Source*: Own elaboration based on City Analytics Enel X, (City Analytics Enel X, 2020).

*Figure 14.* **Rome - daily average number of POI visitors**




*Source*: Own elaboration based on City Analytics Enel X, (City Analytics Enel X, 2020).

*Figure 15.* **Naples - daily average number of POI visitors**




*Source*: Own elaboration based on City Analytics Enel X, (City Analytics Enel X, 2020).

Based on the data presented in Figures 13-15, five main points of interest (the abscissa axis) and the average daily percentage of POI visitors (the ordinate axis) can be distinguished. It should be noted that in the Pre-Covid19 phase (the blue color in Figures 13-15), all values are fall within the normal range, i.e. above the 30% in the cities of Milan (Piazza Duomo) and Naples (Piazza Garibaldi), and the 40% at the Roma Termini station in Rome. During the lockdown phase (marked in orange), the values dropped to the minimum level, with the visitor percentages approximating zero. Undoubtedly, the points of interest examined were compromised the most by the lockdown imposed by the government.

The period of lockdown recovery started on May 4th, entering Phase 2 (marked in grey). The peak of slightly over 10% was recorded for Naples, a very high percentage of subjects traveling to two main POIs: Galleria Umberto and Via Chiaia. Naples therefore is the only city that was recovering from the lockdown in a more determined manner.

Before the pandemic (Pre-Covid19, February 8 – 24), the POIs in Milan and in Naples were visited by a quite high percentage of citizens daily. The Roma Termini is characterized by the highest percentage: an average of 40% of the sample passed through the station every day, with a peak of nearly 60% during the week. Less significant, although quite high, are the values recorded at other POIs, such as Trastevere, a preferred nightlife destination (20.2%), and Villa Borghese, which recorded an average of 1520 visitors daily (based on 10 000 subjects).

The second POI with the most daily 'traffic' is Piazza Duomo in Milan: 31.2% of the Milan inhabitants passed by the Cathedral and the Galleria Vittorio Emanuele II. Considering the difference between the weekday (44.8% on average) and the weekend (30.5% on average) visitor 'traffic' at the Roma Termini is, the percentages recorded for Piazza Duomo did not follow the same dynamics: 35.3% during the weekend and 29.3% during the week. The Milano

Centrale train station is the third most visited POI: daily, only 16.8% of the sample, averagely, passed through the station. Corso Buenos Aires averaged a 1.9%. 11% out of 10 000 citizens of Milan enjoyed the nightlife of the Navigli district on weekends, with a peak of over 17%. In Naples, the Galleria Umberto I and the Naples Garibaldi station were frequented by 28% of the sample. The Chiaia - the city's wealthy district of with boutiques, restaurants and elegant bars, was another place that was never deserted (15.7%).

During Phase 2 - from March 26 to May 3, the percentage of POI visitors dropped significantly during the lockdown, when students and most workers were forced to stay home. The average general percentage of the subjects passing through the POI areas dropped to 4.9% in Milan, 7.3% in Rome, and 11.8% in Naples, whereas none of individual POIs reached a percentage higher than 5% of the sample, a level approximated by the Galleria Umberto I in Naples. In Milan, the POI most frequented during the lockdown was Corso Buenos Aires, with an average of 2.2%. The average for the Roma Termini dropped by over 37 percentage points, and for Piazza Duomo in Milan - by 30 percentage points.

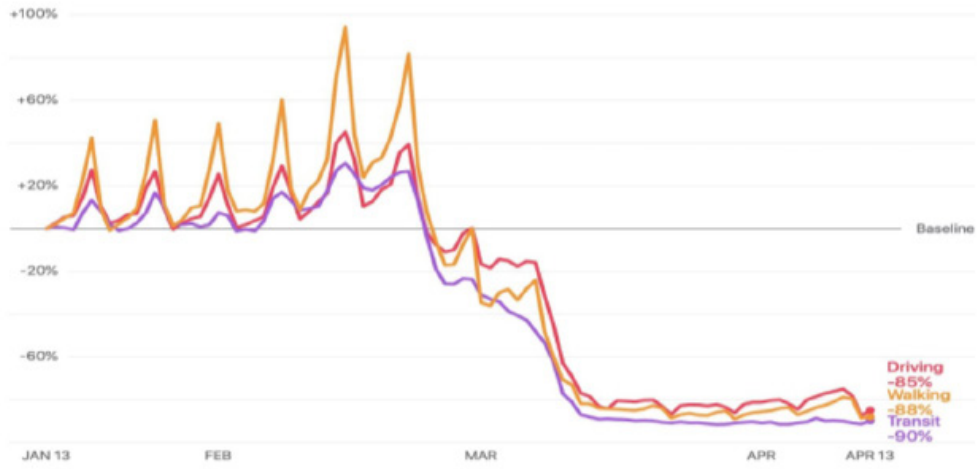
The data collected clearly shows that the mobility trend had practically stopped in the second half of April: -85% of car mobility, -88% of pedestrian mobility, and -90% of public transport vehicle mobility (Figure 16).

In the first week of Phase 2 (4$^{th}$ May – 17$^{th}$ May), offices and factories reopened for 4.4 million workers, in an attempt to return to normal life, with protective masks, sanitary measures and social distancing.

In Milan, only 17.9% of the sample visited the POIs examined. Rome was returning to normal life with the pace of Milan, with the exception of the Roma Termini station, which contrary to the Milano Porta Nuova station, once again became the hub of the Roman mobility: 8.4% of the subjects in Rome began to re-frequent the area.

Naples resumed its mobility more decisively: from 87.4% during the Pre-Covid phase to 12% during the lockdown phase, whereas after May 4, over 3 000 residents went back to usual mobility. More than 20% of the 10 000 sample frequented the areas of Chiaia and Galleria Umberto I.

*Figure 16.* **Mobility trends**




*Source*: The mobility trend reports published at: http://apple.com/covid19/mobility (accessed 12 May 2020).

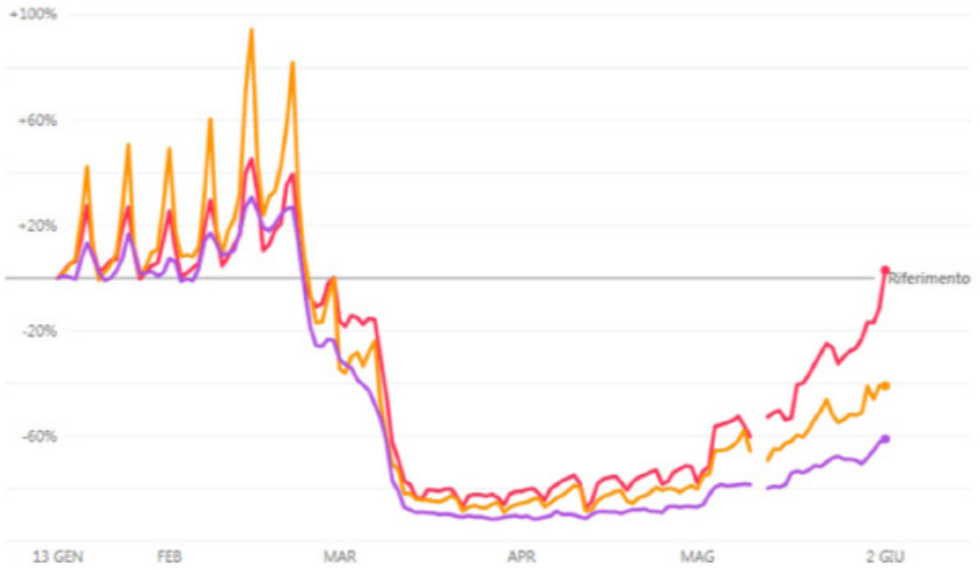
The lockdown data indicate significant improvements on the contagion front. These data (Figure 17) show how much the obligatory confinement was needed but also how much the citizens respected the restriction.

Although not all Italian regions showed such improvement, the restrictions were eased in the relaunch phase and the mobility trend curve began to rise, with an over 3% increase in car travel.

The Italian government was expecting a gradual recovery in various sectors of the social, the economic and the production activity, also through new organizational and relational models, which took

into account the need to contain and prevent situations of crisis (Decree of the President of the Council of Ministers 14 April 2020, Coronavirus, le misure adottate dal Governo, 2020).

*Figure 17.* **Mobility trends**




*Source*: The mobility trend reports published at: http://apple.com/covid19/mobility, (accessed 12 May 2020).

In this regard, as soon as the government started mentioning Phase 2, the mobility trends immediately registered an increase – only a by few percentage points, but it was an increase sufficient enough to cause concern. These values, perceived as an example in the contagion containment measures, indicated signs of possible new outbreaks.

Based on the macroscopic analysis of the Italian regions and the microscopic analysis of the cities, it was found that the impact of the lockdown was quite severe in several sectors and put Italy between a rock and a hard place. In the Pre-Covid19 phase,

daily mobility trends were recoding peaks of over 60%, until they dropped to approximately -85% at the time of the lockdown decree introduction.

According to the International Monetary Fund the new coronavirus had major impact on the Italian economy, with a drop in GDP down to -9.1%, recording a 3% decrease globally.

It is interesting to see how the life of Italians has changed, how the economy was distorted and how it has been recovering, even during the state of emergency, when new forms of adaptation, such as *smart working* and *smart studying* gained popularity, especially in the regions of southern Italy. The road to real recovery is always arduous, but in an epidemic, confinement is the safest solution. The so-called red areas, such as Milan, Bergamo, Lodi, had to keep the emergency plans active, to avoid new possible coronavirus outbreaks.

Summing up, mobility constitutes the core of business and the country's economy. From that perspective, the deserted streets of Italian cities, with vacated workplaces and unattended nearby entertainment and social-life facilities, made people realize how much the pandemic changed the mobility trends of Italians and the dynamics of the socio-demographic relations within cities.

## THE STATE OF EMERGENCY MANAGEMENT

This paragraph aims to analyze and compare the ordinances issued by different Italian regions, following the state of emergency caused by COVID-19 outbreak in the period from March 9 to May 4, 2020 (the so-called Phase 1), as to help determine whether the various restrictive measures introduced with respect to the numerous Decrees of the President of the Council of Ministers (DPCM) could have affected the number of coronavirus cases in regional distribution.

The Decree of the President of the Council of Ministers of 9 March 2020 extended the measures introduced by Article 1 of the Prime

Ministerial Decree of 8 March 2020 (establishing urgent measures to be undertaken in order to contain the contagion in the Lombardy region and in the provinces of Modena, Parma Piacenza, Reggio Emilia, Rimini, Pesaro and Urbino, Alessandria, Asti, Novara, Verbano-Cusio-Ossola, Vercelli, Padua, Treviso, Venice).

According to the provisions of the Decree of 9 March 2020, any form of gathering in public places or in the indoor spaces open to the public was prohibited as well as all sporting events, both public and private, were suspended. The movement of people was prohibited, except for proven health-related necessity or work-related reasons. Additionally, the DPCM of 11 March 2020 prepared suspension of retail commercial activity, markets as well as catering services (excluding courier services, food and beverage points located at gas stations, motorways and railways, airports, lakes and hospitals). Personal services, such as banking, financial and insurance services as well as the agricultural, the zootechnical and the food processing sectors, including the supply chains of goods and services, remained open. The Presidents of the regions additionally could order reduction and/or suspension of local public transportation services, based on the current local needs, ensuring the minimum essential services.

The differences in the ministerial decisions and in the measures implemented at the regional level help understand the varying impact on the number of coronavirus cases. These differences can be analyzed in terms of such factors as: delivery of goods and services, the opening of markets (both indoor or outdoor) and service facilities (hospitals, airports, motorways, gas stations, railway transport), the opening of shrines, the lesser or greater reduction of scheduled/non-scheduled public transportation services, and restriction of individual mobility.

Analyzing the regional ordinances in more detail, it can be noted that with regard to the delivery sector, that the regulations introduced by the regions were not homogeneous (Picture 4). In fact, in the regions of Piedmont, Lombardy, Trentino Alto Adige, Fri-

uli-Venezia Giulia, Emilia-Romagna, Tuscany, Basilicata, Puglia, Molise, Calabria and Sicily, the delivery services remained operational, in line with the ministerial decision, whereas the remaining regions opted for more restrictive measures than those established at the governmental level and restricted this type of services. Umbria and Sardinia, for instance, chose to resume the delivery services on the 3rd and the 4th of April respectively, i.e. during the so-called *Phase 1*, whereas the other regions decided to do so at the end of April (the approach of Phase 2), when the number of coronavirus cases was declining. It is understandable that the delivery sector could have had significant impact on the increase in the number of infection cases, since this type of service involves direct contact with a large number of people. The question is whether in such regions as Lombardy, Piedmont, Emilia-Romagna, Trentino Alto Adige and Tuscany, which recorded high numbers of coronavirus cases, the decision to leave the delivery services operational was reckless or not, especially in the light of the fact that, despite the lower number of cases, other regions decided to introduce the restrictive measures.

With regard to the opening and closing of markets, differences can be seen in the regions of Northern, Central and Southern Italy (Picture 5). Contrary to the ministerial decision to expand the closure of markets, in majority of the northern regions, the markets remained open in Phase 1 (with the exception of Emilia-Romagna, Trentino Alto Adige and Liguria), with all the necessary precautionary measures in force, which cannot be said about the regions of central, southern and insular Italy, where only the Lazio region made the decision to open the markets. As in the case of the delivery service, the decision to open the markets certainly cannot be considered a smart one.

*Picture 4.* **Operability of the delivery service March 9 – May 4, 2020**


*Source*: Own elaboration based on the data from the websites of the regions of Piedmont, Lombardy, Valle D'Aosta, Veneto, Trentino Alto Adige, Friuli-Venezia Giulia, Emilia-Romagna, Liguria, Tuscany, Umbria, Abruzzo, Lazio, Marche, Basilicata, Puglia, Molise, Campania, Calabria, Sicily and Sardinia.

With respect to the places of worship, several Italian regions, such as Valle D'Aosta, Veneto, Emilia-Romagna, Lazio, Abruzzo, Basilicata Puglia, Campania and Sardinia, decided to prohibit their residents from visiting churches, except for particular ceremonies that had been already planned, which was in contrast with the measures introduced at the ministerial level.

Certain homogeneity could be observed in all Italian regions regarding the reduction of regular and non-scheduled transportation services, which were restricted to the same extent in most of the regions, with differences of few percentage points, which was in line with the provisions of the restrictions introduced at the ministerial level. It is interesting to note that Sardinia, despite the very low number of coronavirus cases, decided to completely eliminate maritime transport services in the period from the 15th of March

*Picture 5.* **Closure of all types of markets March 9 – May 4, 2020**


*Source*: Own elaboration based on data provided by the websites of the regions of Piedmont, Lombardy, Valle D'Aosta, Veneto, Trentino Alto Adige, Friuli-Venezia Giulia, Emilia-Romagna, Liguria, Tuscany, Umbria, Abruzzo, Lazio, Marche, Basilicata, Puglia, Molise, Campania, Calabria, Sicily and Sardinia.

to the 3rd of May. Furthermore, Abruzzo decided to reduce railway services by up to 80%, along with a reduction of scheduled and non-scheduled services (ranging from 50% to 80%), which was a very high percentage compared to the rest of Italy. Reduction or suppression of scheduled and non-scheduled services had important impact on the increase or the reduction of infection cases, given the fact that the transport sector involves high quantity of interpersonal contact and therefore poses a very high risk of contagion.

The last factor analyzed is individual mobility (Picture 6). While the decrees issued by the Italian government permitted individual mobility, such regions as Valle D'Aosta, Veneto, Friuli-Venezia Giulia, Liguria, Umbria (mobility permission resumed on April 3), Campania, l Abruzzo, Basilicata (mobility permission resumed on April 15), Sardinia (mobility permission resumed on April 13) as well

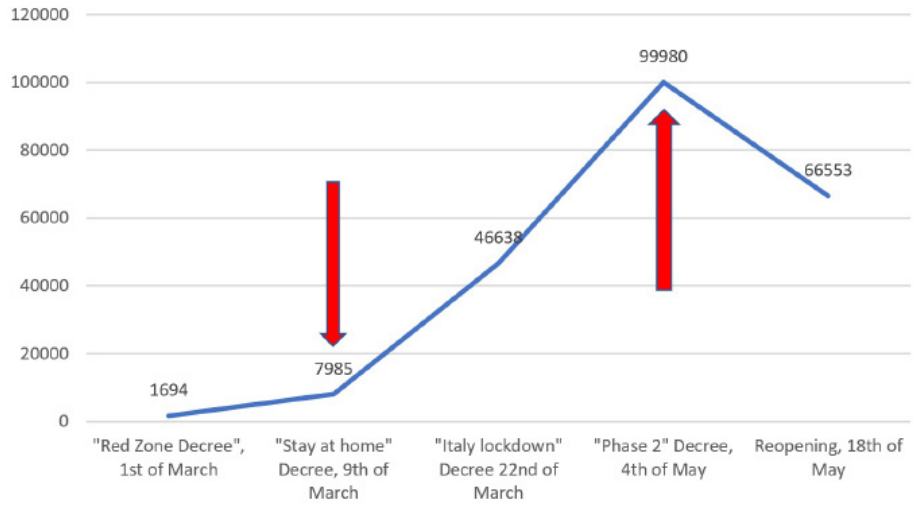
as Sicily and Calabria decided to restrict it, except for health-related and absolutely necessary reasons. In the regions of Piedmont, Lombardy, Trentino Alto Adige, Marche, Emilia Romagna individual mobility was granted (within the distance of 200 meters from the place of residence) despite the fact that these regions were among the those most affected by the virus.

Summing up, it can be seen (Figure 18) that high numbers of coronavirus cases correspond to the increase in the restrictive measures of the ministerial level and therefore to the decrease in the contagion (starting May 4), following the implementation of the restrictions at the regional level.

*Picture 6.* **Individual sport activity March 9 – May 4, 2020**


*Source*: Own elaboration based on the data provided by the websites of the regions of Piedmont, Lombardy, Valle D'Aosta, Veneto, Trentino Alto Adige, Friuli-Venezia Giulia, Emilia-Romagna, Liguria, Tuscany, Umbria, Abruzzo, Lazio, Marche, Basilicata, Puglia, Molise, Campania, Calabria, Sicily and Sardinia.

*Figure 18.* **Number of coronavirus cases and governmental decrees in the period between March 1 and May 5, 2020**




*Source*: Own elaboration based on the website of the Department of Civil Protection and the Ministry's website.

## REMARKS AND OBSERVATIONS

The purpose of the ministerial decision to extend the measures preventing the spread of COVID-19 onto the entire territory of Italy, but at the same time to leave the decision-making autonomy to the regions, can be explained by the fact that most regions did not record very high percentages of coronavirus cases, in comparison to the most affected regions. For this reason, general guidelines were introduced, leaving regional autonomy in terms of restriction severity. The ministerial decisions were based on the fact that the central government did not assume responsibility for the management of individual regions, leaving the decision whether to follow the general guidelines or not to individual local-governments.

Italy certainly is not a homogeneous territory in terms of the measures introduced by different regions. This varying approach has influenced the number of COVID-19 infections, i.e.

the different regional-ordinance factors under analysis affected the number of cases, to a lesser or a greater extent. Such regions as Lombardy, Piedmont, Tuscany and Emilia-Romagna, which are among the most affected ones, at the national level, followed the ministerial line entirely, or to greater extent, unlike many central, southern, insular regions, and certain less-affected northern regions, which followed a more restrictive approach.

Ultimately, the question remains of whether the approach adopted by such regions as Lombardy, Piedmont, Tuscany and Emilia-Romagna was actually prudent and whether the ministerial decision to launch the so-called *Phase 2* was right, despite the very high number of infections recorded in several regions, especially in Lombardy.

# CHAPTER 2

# The Italian national health system

## THE ITALIAN HEALTHCARE-SYSTEM MODEL

The Italian healthcare system is based on three fundamental principles: universality (i.e. the extension of healthcare services onto the entire population), equality (the access to care without any discrimination) and equity (equal access in relation to equal health-related needs).

With the reform of Article V of the Constitution, a federal system was introduced, in which certain matters were not expressly reserved to state legislation but to the regions and to the local substate bodies defined by the constitution and operational since 1970. The management of the healthcare system is therefore shared between the State, which has the task of redistributing the financial resources among the regional territories, and the regions, which are responsible for the organization and management of healthcare (Cremonese, 2008). The system allows the regions to offer further services or to use their own resources (i.e. co-payments based on income conditions). In this way, Italy moved from a single National Health Service to several Regional Health Services, which have to

guarantee all essential levels of healthcare assistance (the so-called core benefit package – Livelli Essenziali di Asistenza, LEA).

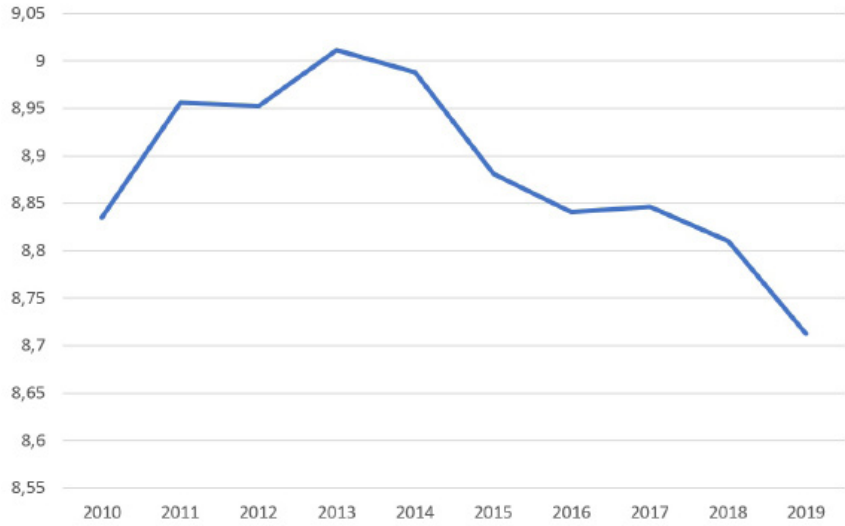
On the national scale, healthcare is guaranteed based on a multi-year programming system articulated around the National Health Plan (the main planning tool) and the Regional Strategic Plans, which, through implementation of the guidelines of the National Plan, define the healthcare objectives and the functioning of regional services (The White Paper on the fundamental principles of the National Health Service). In September 2020, the 2006-2008 National Health Plan was still in force. The delay in the plan update denotes he government's lack of attention to the issue. More attention is paid on the regional scale, where the planning tools seem to be more updated (with the exception of certain southern regions). The tool used for assessment of the National Health Plan implementation process is the report on the country's health status, which illustrated the general health condition of the population, the resources used, and the results achieved, with respect to the objectives set by the National Health Plan and the regional plans (Ministero della salute, 2006-2008; 2012-2013). The most updated version of this document (2012/2013), which should constitute the basis for the elaboration of health policies and the planning of interventions, reads that the economic and the financial system of the Italian public healthcare suffered a shrinkage in the resources available before the epidemy evolution, from the perspective of the demand for healthcare services, the aging of the population and the consequent increase in chronic conditions as well as the general need for new investments into research, therapies and various related instruments.

The reduction in investments, which has been highlighted in the document, is evidenced in the healthcare expenses: according to the most updated data from the Organization for Economic Cooperation and Development (OECD), in 2018 Italy allocated 8.8% of the GDP to healthcare and this percentage has been dropping, considering the healthcare expenditures financed from public funds.

This figure has gone down in recent years, from 7% in 2010 - close to the OECD average of 6.6% (Figure 19).

The per-capita expenditure on the Italian National Health System can be analyzed based on the OECD data. In 2018, this figure was around $ 2 545 (approx. $ 2 326), compared to the $ 2 434 (approx. $ 2 225) in 2010. In 2018, developed European countries, such as Germany ($ 5 056), France ($ 4 141) and the United Kingdom ($ 3 138), spent more on healthcare than Italy. This raises legitimate doubts about the Italian system's resilience in the face of sudden crises.

*Figure 19.* **Healthcare expenditure (% of GDP)**




Source: Own elaboration based the data provided by OECD (State of Health in the EU: Italy. Health Profile, 2019).

In terms of the number of doctors per an inhabitant, Italy is in a better position, although most doctors are approximating the retirement age, while the number of general practitioners has been in sharp decline - currently the ratio is 4 doctors per 1000 inhabitants, compared to the EU average of 3.6 (OECD, "State of Health in the EU:

Italy, Health Profile 2019). The nurse-per-inhabitant ratio is 5.8 (per 1 000 inhabitants), compared to the average 8.5 within the EU.

In-depth analysis highlights some signs of difficulty, attributable, for example, to regional differentiation regarding the right to equal access to healthcare, or to the difficulties in healthcare accessibility for those who are unable contribute copayments, which in turn results in healthcare-related mobility between the south and north of the peninsula. The growing need to integrate the financing of healthcare by the citizens, the difficulties in healthcare personnel training and, above all, the 30% reduction, between 2000 and 2017, in the number of hospital beds per capita, from 3.9 per 1 000 inhabitants to 3.2 (the EU average is 5 beds per 1 000 inhabitants), have been important signals of the problem (Parliamentary Budget Office, 2019).

Nonetheless, the healthcare system in Italy, where life expectancy is among the highest in Europe, shows good resilience, e.g.: the number of hospital admissions due to chronic diseases as well as the mortality rates for diseases that are preventable and treatable are among the lowest in the EU. The situation, however, varies between the regions, both in terms of the regulations and the effectiveness of the policies. Based on the analysis of the different regional conditions, it seems that individual Regions are still far from the implementation of the tools shared between the different territories, which favor the privacy, the effectiveness and the safety of healthcare in Italy (Report on the Health Status of Country 2012/2013)

In reality, federalism has led to a different situation, in terms of the healthcare response: northern, richer regions, capable of ensuring quality services, are in contrast with the poorer regions of the South, which have financial deficits and must follow repayment plans. Compared to the regions where the services offered by hospitals are supplemented with territorial medical services, other regions, such as Calabria, are disconnected and disorganized.

This discrepancy also emerges from the analysis of the planning tools, which in some cases are non-existent or outdated (as in the case of Sicily, Calabria), which in turn affects the quality and the efficiency of the services provided, as evidenced by the analysis of the health performance index (Indice di Performance Sanitaria, IPS) developed by the Demoskopica research institute (Demoskopica, La performance salute, 2019).

To mitigate the endemic weaknesses and other criticalities, an attempt was made to intervene with the development of debt repayment plans. It should be stated, however, that per-capita expenditures vary widely between the regions. Analysis of the data shows that in the South, per-capita health expenditures are significantly lower than in the North, where higher public funding allows the highest quality of healthcare services, despite the clichés on the subject. The distribution of healthcare funds, for instance, gains greater significance based on the age of the population and the number of the elderly, favoring the northern regions and to the disadvantage of poorer territories, where people die at younger age and where high percentage of chronically ill patients were recorded. Greater availability of funding means investment in equipment (Veneto, Lombardy and Piedmont invest large sums in the modernization and purchase of medical equipment, e.g. in 2019 these regions invested about € 300 million in medical equipment), better management of prevention policies and reduction of waiting times, as per the provisions of national planning. The long waiting time is a big problem for the Southern regions, where only Campania is able to maintain satisfactory standards. This once again highlights the deficits in planning, but above all the absence of a plan that can ensure healthcare more suitable to the citizens' needs, as evidenced by the 2019 Svimez report, which shows that the greater demand, the lesser the response (in the south, 36.5% of families need such services, but only 12.5% receive it).

The above-mentioned observations also emerge from the analysis of regional data (Table 1) and from the report on the quality of healthcare services in Italy (Demoskopika Institute, IPS 2019). The trend in the healthcare services offered in the North of Italy (e.g. Trentino-Alto Adige, Emilia Romagna and Umbria) and that of the South differ. As such, it is possible to assume that federalism has exacerbated territorial disparities and favored private healthcare over public healthcare. This has been proved by the increase in the healthcare churn rate but also by the high percentage of health-related mobility, with the resulting increase in the costs for patients and their families, to the advantage of Central/Northern areas.

*Table 1.* **Italian healthcare system**

| *Northern Regions* | **Healthcare Expenditure (€)** | **Healthcare Expenditure per capita (€)** | **Hospital beds** | **IPS** | **N° Hospital beds ICU** | **N° Hospital beds planned** |
|---|---|---|---|---|---|---|
| Emilia-Romagna | 9 100 000 000 | 2 040 | 16 453 | 107.3 | 449 | 962 |
| Friuli V.G. | 2 047 000 000 | 1 368 | 3 833 | 103.7 | 127 | 155 |
| Lazio | 10 744 200 000 | 2 443 | 18 431 | 101.5 | 557 | 707 |
| Liguria | 3 332 500 000 | 2 054 | 4 994 | 101.3 | 186 | 251 |
| Lombardy | 19 866 000 000 | 1 904 | 34 938 | 104.1 | 900 | 1.260 |
| Marche | 2 829 000 000 | 1 810 | 4 615 | 104.9 | 109 | 163 |
| Piedmont | 8 441 000 000 | 1 848 | 14 657 | 102.5 | 320 | 420 |
| Tuscany | 7 403 000 000 | 1 388 | 10 340 | 104.2 | 447 | 650 |
| Trentino A.A. | 2 478 000 000 | 2 160 | 3 739 | 107.5 | 72 | 122 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Umbria | 1 750 000 000 | 1 931 | 2 882 | 105.2 | 70 | 94 |
| Valle d'Aosta | 259 000 000 | 2 061 | 451 | 101.8 | 10 | 25 |
| *Southern Regions* | | | | | | |
| Abruzzo | 2 474. 000 000 | 1 818 | 3 913 | 96.4 | 109 | 151 |
| Basilicata | 1 090 000 000 | 1 936 | 1 684 | 98.7 | 49 | 61 |
| Calabria | 3 331 000 000 | 1 707 | 4 888 | 89.1 | 141 | 221 |
| Campania | 10 072 000 000 | 1 730 | 15 372 | 91.6 | 505 | 600 |
| Molise | 623 000 000 | 1 900 | 1 056 | 101.7 | 19 | 27 |
| Puglia | 7 380 000 000 | 2 300 | 11 646 | 98.0 | 306 | 306 |
| Sicily | 9 242 000 000 | 1 765 | 13 916 | 93.8 | 411 | 611 |
| Sardinia | 3 269 000 000 | 1 356 | 5 023 | 95.8 | 123 | 163 |
| Abruzzo | 2 474 000 000 | 1 818 | 3 913 | 96.4 | 109 | 151 |

*Source*: Own elaboration based on the ISTAT data (ISTAT, Istituto Nazionale di Statistica, 2020).

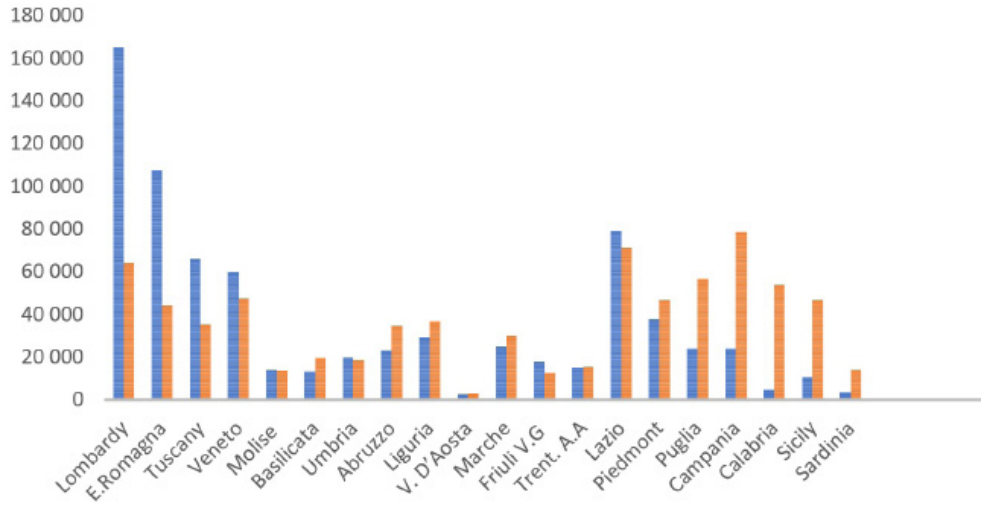
Regional health-related mobility includes both active mobility (related to a given region's credit standing that determines its attractiveness index), based on healthcare services offered to non-resident citizens, and passive mobility (the region's debit standing), based on the healthcare services provided to citizens outside the region of residence (Figure 20). The record for active interregional mobility was set by Lombardy, with 165 000 extra-regional hospitalizations, while Emilia-Romagna ranked second, followed by Lazio, Tuscany and Veneto. An exodus from the south to the north, in particular from Calabria and Campania, could be observed (migration to the northern regions: 41% due to oncological diseases and 27% due

to chronic diseases). 8% of the total health-related mobility to other regions was recorded in Calabria, where 65% of the healthcare resources were exhausted in passive mobility. Additionally, migration to the neighboring regions could be observed in the South (the so-called proximity mobility), i.e. to Molise, which is the first place for hospitalization of patients from other regions, especially the neighboring ones. The region's negative result was caused by Sardinia, which was probably due to the geographical reasons casing the citizens to use local healthcare services. It should be noted that in the South, a sense of distrust of its healthcare system prevails, due to both the structural deficiencies and the long waiting time for medical visits/procedures. The number of hospital beds is not without significance either, there was a rather evident gap (33.7 beds for ordinary hospitalization in the central and norther regions of the country and 28.2 beds in the center of the southern region). For these reasons, the 2019-2021 health pact has required the central and the regional authorities to map the mobility by the type of the service provided as well as to identify the correspondence of that mobility to specific situations of supply shortages in critical sectors. Ultimately, a vicious circle has formed between active and passive mobility, which resulted in enrichment of the northern regions (88% of the credit balance went to Lombardy, Emilia-Romagna and Veneto) and impoverishment of the regions to which the debt was charged.

With regard to COVID-19, in most Italian regions, contrasting measures were adopted, based on the incidence index of course. Campania was the most active southern region, as it was among the first Italian regions to finance COVID-19 research centers, with total expenditure of € 7 million. In addition, the Campania region reinforced the activity of the Federico II University operational control center for health emergencies. In the northern regions, Veneto did not finance any new hospitals, but designated a Covid-19 Hospital separate from Covid-19-free hospitals. Only the Hub Hospitals

remained under mixed management, since they had to guarantee services for all kind of medical conditions. In Lombardy - the epicenter of contagion, two new ad hoc hospitals were built: a field hospital in Bergamo, with 12 ICU beds, and one in Milan, with 22 ICU beds (a cost of € 17 million). Emilia-Romagna implemented a most innovative project: the Covid-19 Intensive Care - a network of intensive care units with 146 beds, for a total cost of € 26 million.

*Figure 20.* **Correlation between active and passive mobility**




*Source*: Own elaboration based on the IPS 2019 data (Demoskopika Report, 2019).

Summing up the analysis carried out, the difference in the financial resources allocated, but also the divergent governance approach between the North and The South of Italy need to be underlined, because this had impact on the citizens' level of satisfaction with the healthcare system, the political dissatisfaction and the increased health-related mobility from the South to the North. One of the most paining problems was the long waiting time foe medical services (Calabria and Sicily recorded peak values in this regard), which forced the citizens to seek help in the private medical sector. This, however, involved an economic effort on the part of the pa-

tients, which often caused financial difficulties, as evidenced by the IPS data on economic discomfort (Demoskopika Report, 2019), i.e., in the South (particularly in Calabria), 14.9% of households reported severe economic difficulties resulting from the lack of access to public healthcare services (private healthcare is very expensive). The mobility trend mirrored the north-south gap: passive mobility was extremely visible in Campania and Calabria, whereas the attractiveness index was highly evident in the North, in particular in Lombardy and Emilia-Romagna. What is more, the analysis showed that certain southern regions had outdated health plans and a significant difference existed in the number of hospital beds (33.7 beds per capita in the North and 28.2 in the South).

# CHAPTER 3

# Context factors and the spread of the virus

## THE SOCIO-DEMOGRAPHIC CONTEXT

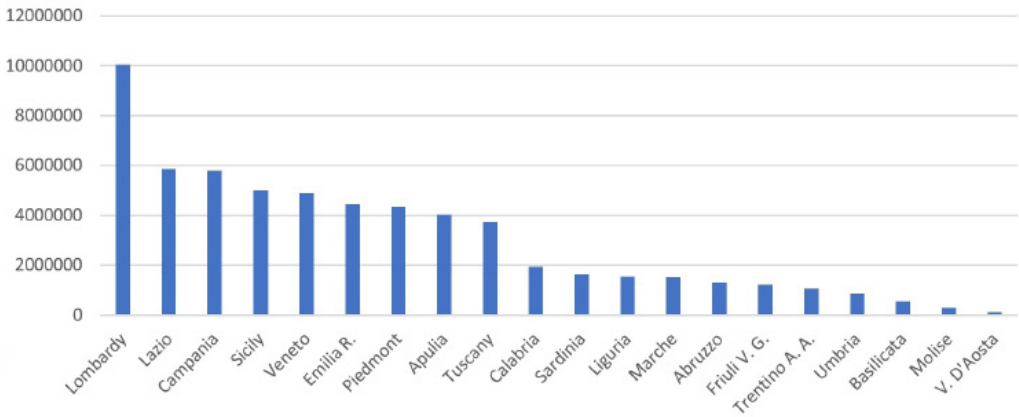
In the first acute phase of the COVID-19 pandemic, the virus affected certain regions of northern Italy in particular. The health system in the North of Italy, although more efficient than that of other regions, could not sustain the high number of patients in the need of treatment nor effectively manage the containment of the infection via territorial policies that would be effective. This lack of preparation and efficiency was related to the high number of coronavirus cases and the high mortality rate, which characterized the spread of the virus in Italy - the first country affected after the virus outbreak in China.

In the light of the above, this section aims to describe the context factors that characterized the regions examined, in order to identify specific aspects and vulnerabilities. Regional demographics, in particular the population density of Italian regions, as well as the inhabitants' average age and life expectancy were analyzed,

along with the data on the inhabitants' income, as to assess the correlation between the financial standing and the contagion.

Population distribution in Italian regions (Figure 21) is rather uneven. The region with most population was Lombardy, with about 10 million inhabitants, whereas the regions with population of less than 1 million were Valle d'Aosta, Molise, Basilicata, and Umbria (as of early fall 2020).

*Figure 21.* **Population distribution in Italian regions**




*Source*: Own elaboration based on the ISTAT data, (ISTAT, Istituto Nazionale di Statistica, 2020).

To better illustrate the population distribution in the regions, the data values were summed in terms of geographical areas, which showed that the most populated area was the north, with population concentration of 49%. In the other two geographical areas, these values was more evenly distributed, with a slight predominance of the South (27%) over central regions (24%).

The population data alone do not provide sufficient information on the reasons for the spread of the contagion. Population density is

the most significant variable here. As such, in addition to the analysis of regional average population densities, population density values were also examined in distribution by province, in order to isolate the micro-regions that were the focal points. Interestingly, the North, the teritory with highest spread of the contagion, exhibited widespread high population density:

- The Metropolitan City of Milan 2 063 subjects per sq km,
- Monza and Brianza 2 256 subjects per sq km,
- Varese 743 subjects per sq km,
- Como 468 subjects per sq km,
- Lecco 410 subjects per sq km,
- Bergamo 405 subjects per sq km.

In the other regions, the population distribution was different: high density in the urban areas, with less populated surrounding areas.

From the demographic perspective, Italy is very homogeneous, both in terms of the citizens' average age, i.e. approx. 45 years of age, and the life expectancy, i.e. 82 years old (Figure 22).

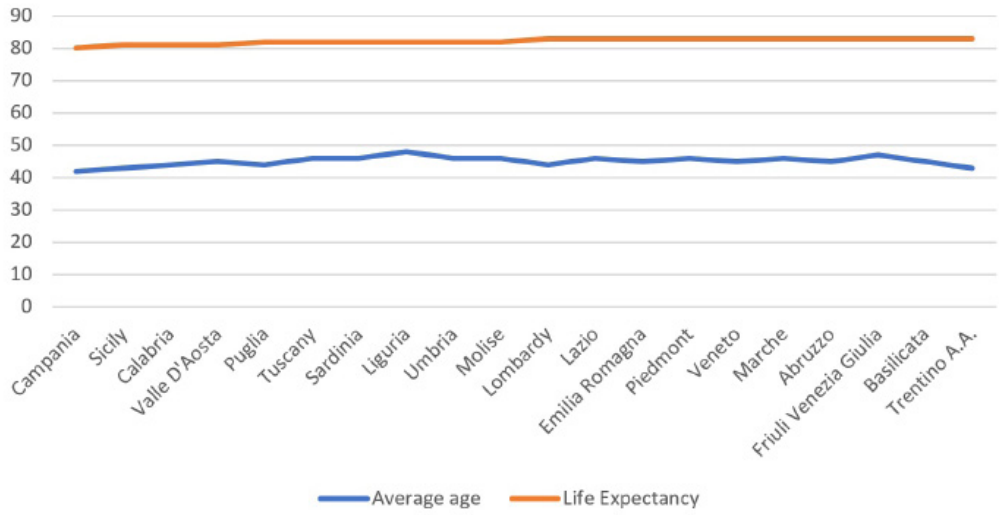
The region with the highest average age of citizens is Liguria (48 years of age), while the 'youngest' region is Campania (42 years of age).

Analysis of the life expectancy data showed that it was slightly lower in the South, which suggests that the health planning in the North was at the time more efficient than in the South, where the lowest value recorded was 80 years of age for Campania, followed by Calabria and Sicily, with 81 years of age, whereas in the North, an increasing trend was recorded, with the average of 83 years of age.

Lower life expectancy usually is linked to lower income, which delays access healthcare and thus could be linked to the compro-

mised clinical situation in Italy. This economic factor, therefore, was an element of the country's weaker resilience.

*Figure 22.* **Average age and life expectancy of Italian citizens**




*Source*: Own elaboration based on the ISTAT data, (ISTAT, Istituto Nazionale di Statistica, 2020).

A study conducted in the United States by the US Centers for Disease Control (CDC) found that African Americans accounted for 30% of the Covid-19 cases, although they only make up 13% of the US population. This could have also resulted from the income variable, since low income often prevents access to health insurance, which often is linked with untreated medical conditions, poorer working conditions or residence in poorer neighborhoods that are more crowded and thus subject to less control by authorities.

Although the Italian healthcare system is public and provides free access for all citizens and the welfare system guarantees decent living conditions even for the weakest social classes, the fact that the economic aspect plays an important role in life expectancy and quality is undeniable.

Interestingly, despite the fact that southern regions are characterized by greater socio-demographic fragility and weaker socio-medical performance, they resisted the first wave of the pandemic better, with respect to the northern regions. Consequently, the reasons for such aggressive attack of the virus observed in the northern regions had to be sought in other factors. One of these factors is the level of regional and national infrastructure connectivity.

## ANALYSIS OF INFRASTRUCTURE CONNECTIVITY AND REGIONAL MOBILITY SYSTEMS

The railway is the most important means of transportation and communication in Italy. The trends observed prior to the pandemic suggest that consumer preference changed radically, in favor of more sustainable means of transport, i.e. many people prefer to travel by train rather than a private means of transportation which generate higher levels of expenditure and pollution. The increased demand for the service indirectly caused the modernization of the railway system. The relationship between the supply and the demand seems to be a two-way correlation: strategic investments increase efficiency levels, whereas increased supply has been linked to increased demand.

Significant increases in the number of train users were recorded, both for long-distance journeys (the convenience of high speed trains) as well as for regional and metropolitan lines. In 2018, 5 699 million passengers used intra-regional trains daily (an increase of 1.6% compared to 2017). An increase in the number of subway users was also observed: in 2018, additional 65 thousand passengers daily (+2.4%), compared to 2017.

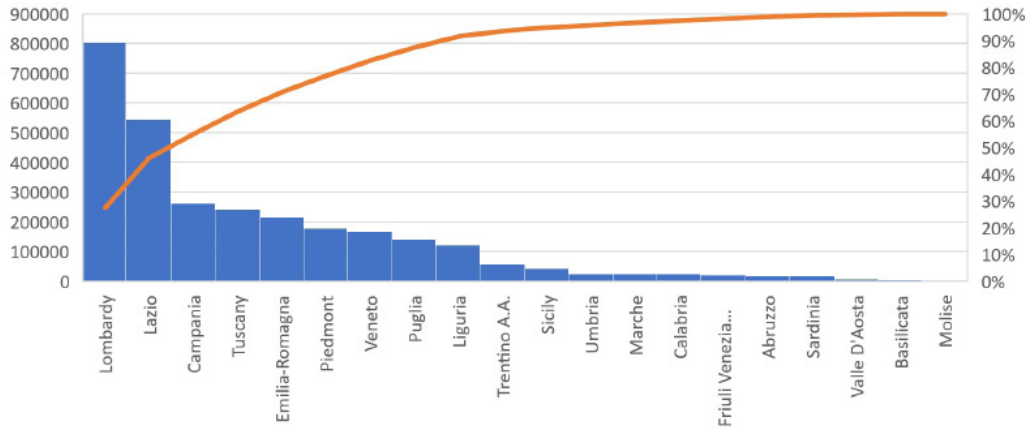
Almost 3 million people used the regional railway service daily, 1 413 million passengers traveled on Trenitalia trains and 1 502 million on the trains of 20 different concessionaires (including the Trenord in Lombardy, with 802 000 passengers; the CTI in Emilia-Romagna,

with 215 000 passengers; the Atac in Lazio, with 190 000 passengers; and the Eav in Campania, with 142 000 passengers).

At the same time, daily, over 2.78 million people traveled on subways (in 7 cities: Milan, Rome, Naples, Turin, Genoa, Brescia and Catania). The increase in the demand, however, varies between the North and the South. In fact, a considerable difference in the demand and the number of passengers as well as a substantial divergence in the efficiency levels of the services offered could be observed.

In terms of the demand, the increase noted in the years 2011-2018 mostly pertained to the Northern of Italy: Emilia-Romagna (an increase from 114 000 to 215 000 passengers), Trentino (from 13 000 to almost 27 000), South Tyrol (from 24 200 to about 30 000), Lombardy (from 650 000 to 802 000). The South, on the other hand, showed a substantial drop in some regions: Campania went down from 467 000 to 262 000 passengers; Molise recorded a 11% drop, while Basilicata a decrease by 34% (Figure 23).

*Figure 23.* **Daily passengers in Italian regions in 2018**




*Source*: Own elaboration based on the Rapporto Pendolaria data (Rapporto Pendolaria, 2019).

This considerable difference between the regional efficiency levels of the railway services and the national railway connectivity was mainly visible in the northern part of the country, where the largest production facilities are located and where the demand for services is higher.

The South has fewer railway lines, fewer registered vehicles and thus people travel less. Daily, 266 journeys were recorded in the Province of Bolzano, which is almost as many as in Sardinia (297), where the population is more than triple of that in Bolzano.

Two other variables, which help better understand the disparity between the North and the South, are the number of railway stations, the number of the trains available, and the length (in km) of the railway network (Table 2).

*Table 2.* **Italian railway and number of stations**

| **Region/ Autonomous Provinces** | Double track km | Single track km | % Single track | Electric km | Non-electric km | % Non-electric | Railway km | Number of Stations/ stops |
|---|---|---|---|---|---|---|---|---|
| Abruzzo | 123 | 553 | 81.8 | 470 | 206 | 30.5 | 676 | 95 |
| Basilicata | 18 | 446 | 96.1 | 211 | 253 | 54.5 | 464 | 55 |
| Bolzano Province | 144 | 157 | 52.1 | 241 | 60 | 19.9 | 301 | 55 |
| Calabria | 279 | 686 | 69.6 | 488 | 477 | 49.4 | 965 | 143 |
| Campania | 736 | 647 | 46.9 | 1102 | 281 | 20.3 | 1 383 | 281 |
| Emilia-Romagna | 798 | 875 | 52.2 | 1362 | 311 | 18.6 | 1 637 | 240 |
| Piedmont | 781 | 1.195 | 60.5 | 1406 | 570 | 40.5 | 1 976 | 197 |
| Puglia | 929 | 613 | 39.7 | 881 | 661 | 75.0 | 1 542 | 189 |
| Sardinia | 50 | 549 | 98.2 | 0 | 599 | 100.0 | 599 | 90 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sicily | 193 | 1 297 | 87.0 | 801 | 689 | 46.2 | 1 490 | 187 |
| Tuscany | 794 | 769 | 49.2 | 1060 | 503 | 32.2 | 1 563 | 198 |
| Pr.Trento | 49 | 130 | 72.6 | 112 | 67 | 37.4 | 179 | 63 |
| Umbria | 183 | 349 | 65.6 | 511 | 21 | 3.9 | 532 | 79 |
| Valle D'Aosta | 0 | 81 | 100.0 | 0 | 81 | 100.0 | 81 | 7 |
| Veneto | 612 | 633 | 50.8 | 782 | 463 | 37.2 | 1 245 | 184 |
| Total | 8 392 | 10 997 | 56.7 | 13322 | 6 067 | 31.3 | 19 389 | 2 811 |

*Source*: Own elaboration based on the data provided the RFI and the Pendolaria Report 2019, (Rapporto Pendolaria, 2019; Rete Ferroviaria Italiana, 2020).

Based on the data available, the following several conclusions could be drawn: firstly, the North is very well connected, operates with relatively new trains, and the service is relatively efficiently managed. All this essentially depends on the very high level of the demand for the service. The South, despite the investments, could not meet the demographic needs (mainly Campania, Puglia and Sicily), where the population density indicated a demand for a denser connectivity and a more integrated railway network.

These different infrastructural conditions most certainly contributed to the lack of homogeneity in the percentage of Covid-19 infections in different regions: higher mobility and connectivity indicated higher rates of contagion - a sign that this factor, in addition to the various containment measures undertaken and the demographic variables, also contributed to the spread of the virus.

Similar territorial differentiation was recorded with regard to air traffic.

Italy has a very efficient airport system. There are 45 civil airports: 18 in the South (including main islands), 10 in the Center and 17 in the North (Picture 7). The most important airport hubs are located in 3 regions: Lombardy (Malpensa, Linate and Bergamo aiports),

Lazio (Fiumicino and Ciampino airpots) and Campania (the Naples-Capodichino airport).

*Picture 7.* **Regional distribution of airports (2019)**


*Source*: (Assaeroporti, 2019).

Fiumicino and Ciampino are central airports with the highest number of passengers annually, with over 43.5 million passengers in 2019. It ranks first in Italy, in terms of the volume of activity, as the leading European hub supporting international connectivity. In 2018, important airline connections with China were launched, with a new network of 12 destinations. Airline passenger traffic to North America and Russia also recorded an increase.

Lombardy has four civil airports, Linate, Milan Malpensa, Bergamo-Orio Al Serio and Montichiari. In 2019, the Bergamo Airport recorded an exponential growth in the number of passengers and ranked third in the air traffic ranking of Italian airports (13 857 257 passengers, an increase by 7.1%, compared to 2018).

Overall, the busiest airline routes were London, Naples, Bari, Barcelona and Brindisi. Spain was the main foreign market, followed by Romania, the United Kingdom and Germany. The first non-EU market was Morocco, followed by Russia and Turkey.

Linate and Malpensa broke the record in 2019, recording 35 million passengers annually (+4.4%, compared to 2018), despite the fact that Linate had been closed for few months. The reference markets were divided into: domestic (+19.6%), European (+5.8%) and intercontinental (+11.2%). In 2018, ranking as the second busiest airport, Malpensa dominated in mainland flights, whereas the Malpensa-New York destination was the second busiest route in Italy (791 985 passengers annually) and the Malpensa-Dubai route was the fourth (681 844 passengers).

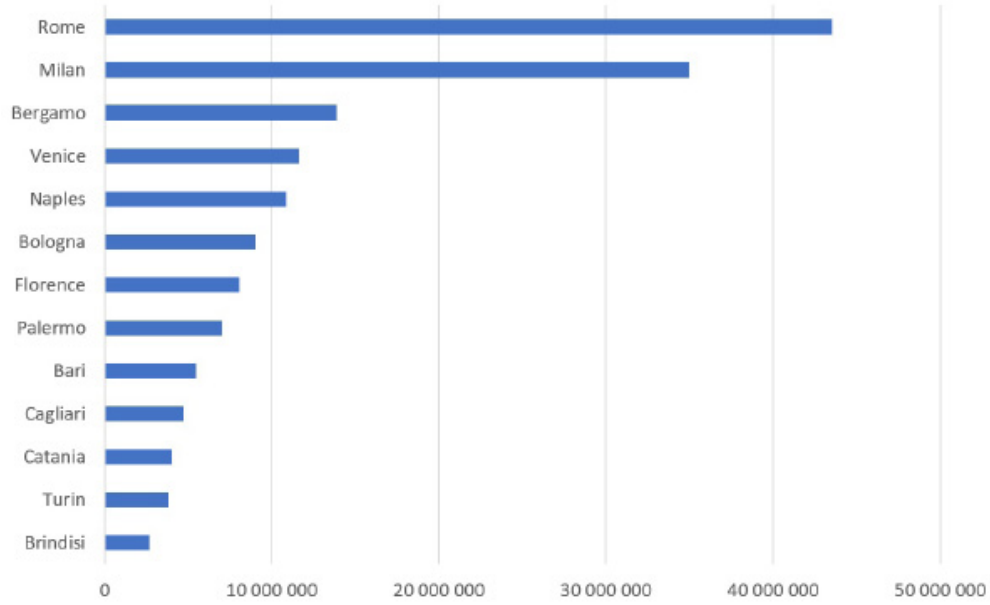
The Naples International Airport recorded 10 860 068 passengers in 2019 (+9%, compared to 2018), roughly divided into 3 423 000 domestic and 6 965 000 international passengers. The main destinations were Milan, London and Paris. At the same time, new intercontinental flights to New York and Dubai were launched. The air traffic in Italy is illustrated on Figure 24.

Based on the above-presented data, the North exhibited a consistent volume of air traffic: adding up the data on the two main airports in Lombardy, the number of passengers exceeded that at both Rome airports. In the South, the numbers were even lower: the sum of airline passengers at the most important airports did not even approximate the number of the passengers at the Fiumicino and the Ciampino airports.

This suggests high vulnerability to virus contagion in the regions with the highest number of passengers (mainly international).

The highest levels of contagion were recorded in the cities and the regions of high internationalization, which could easily be associated with the intensive air traffic (e.g. Milan, Madrid, Paris, New York).

*Figure 24.* **Air traffic in Italy**




*Source*: (Assaeroporti, 2019).

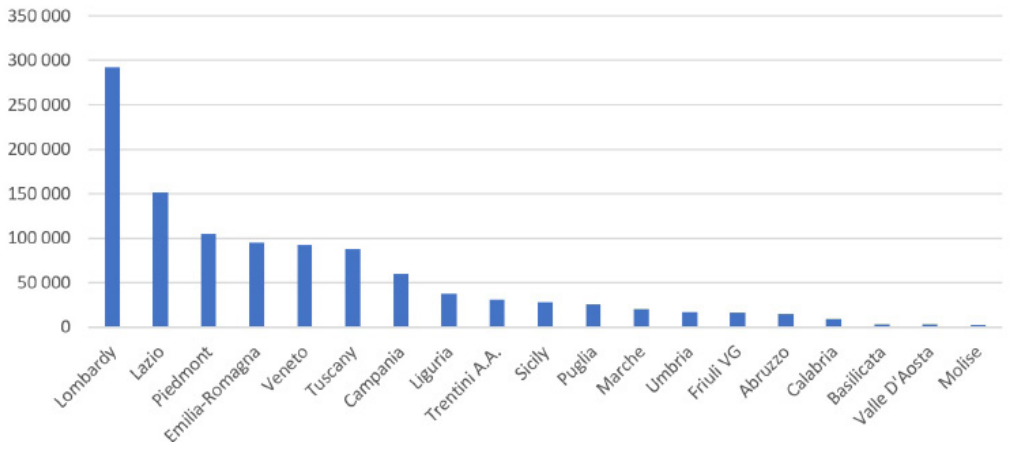
Maritime connectivity seems to be of less significance in terms of the Covid-19 pandemic: the geographical insularity, in fact, preserved these territories from massive exposure to the virus and, thus, the two largest islands, Sicily and Sardinia, were only slightly affected by the crisis.

Nevertheless, certain aspects and data had to be taken into account for the sake of analysis completeness, especially with regard to the summer season, which particularly affected these two regions.

There are 7 commercial and cargo ports in Sardinia: Cagliari, Olbia, Porto Torres, Oristano, Golfo Aranci, Porto Vesme and Santa Teresa di Gallura. In 2018, these ports serviced 47.7 million tons

of goods. Additionally, there are 63 tourist ports, located in 5 provinces. In international terms, based on 2018 data, most tourists traveled from Germany (2 111 414), France (1 335 739), Switzerland (799 620) and the United Kingdom (660 136). Italian-origin tourists mainly traveled from Lombardy (1 831 215), Lazio (782 137) and Piedmont (617 673), (Figures 25 and 26).

*Figure 25.* **Regional origin of tourists in Sardinia (2018)**

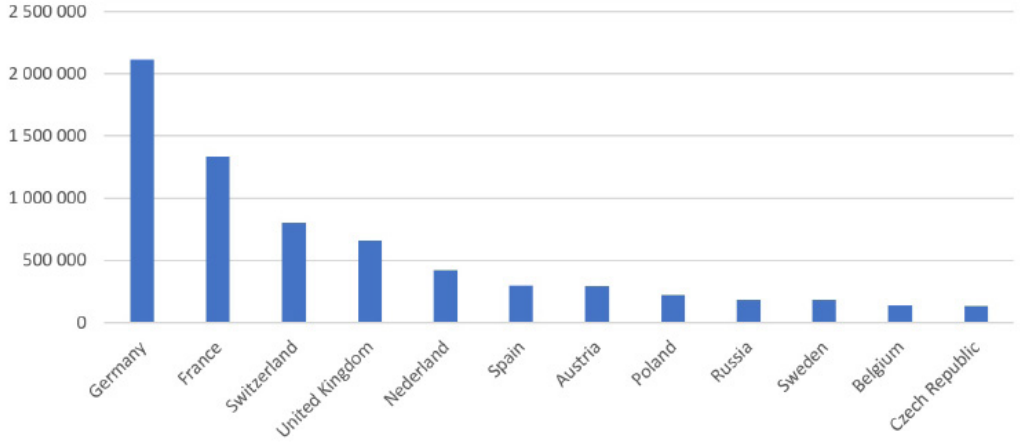



*Source*: Own elaboration based on the ISTAT data (ISTAT, Istituto Nazionale di Statistica, 2018).

Sicily has 5 commercial and cargo ports: Catania, Messina-Milazzo, Palermo-Termini Imerese, Augusta, which in 2016 serviced more than 64 million tons of goods. In addition, there are 68 tourist ports, located in 8 provinces. In 2018, the highest foreign tourist inflows were recorded with regard to France (1 584 410), Germany (1 185 041) and the United Kingdom (653 767) (Figure 27).

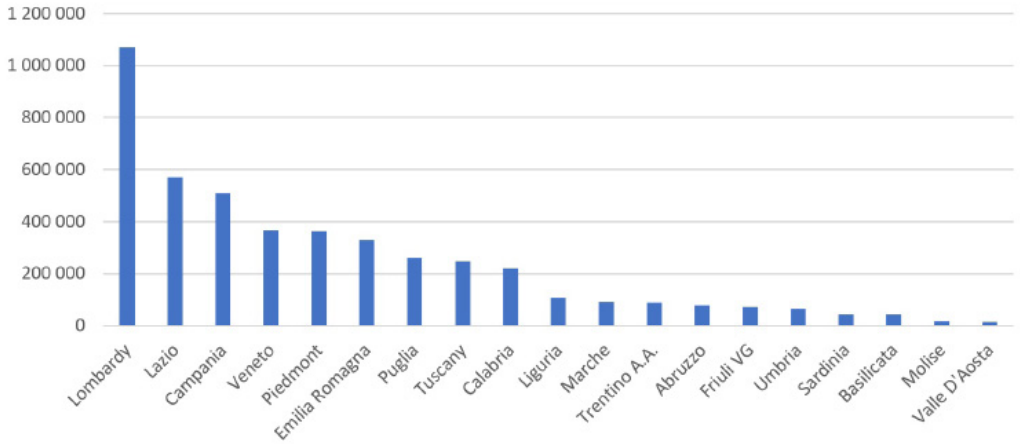
The Italian tourists in vast majority came from Lombardy (296 188), Lazio (194 447) and Campania (143 012) (Figure 28).

*Figure 26.* **International origin of tourists in Sardinia (2018)**



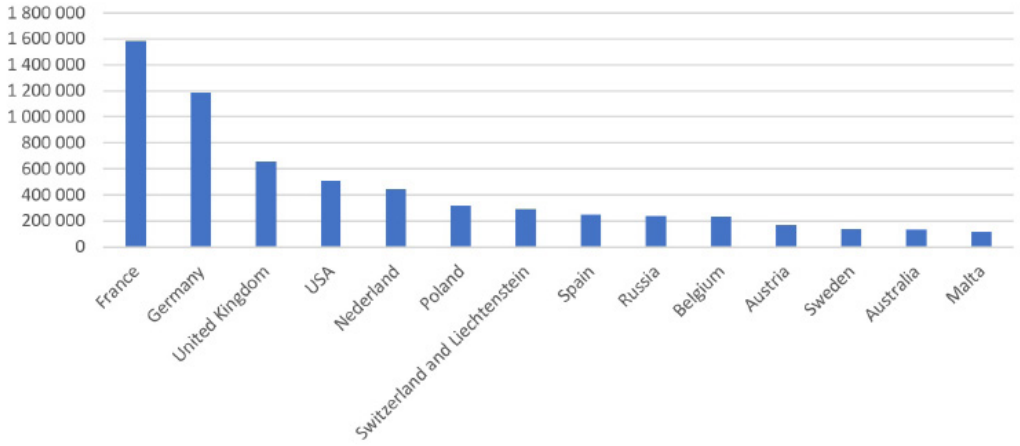

*Source*: Own elaboration based on the ISTAT data (ISTAT, Istituto Nazionale di Statistica, 2018).

*Figure 27.* **Regional origin of tourists in Sicily (2018)**




*Source*: Own elaboration based on the ISTAT data (ISTAT, Istituto Nazionale di Statistica, 2018).

*Figure 28.* **International origin of tourists in Sicily (2018)**




*Source*: Own study of data provided by ISTAT (ISTAT, Istituto Nazionale di Statistica, 2018).

The economic significance of the tourism sector has always been crucial for the two regions, which could explain the fears and the hopes associated with the reopening of the tourism industry. As the figures presented above show, the place of origin of the tourist inflow seems to be an important factor: the highest inflow rates were associated with the Italian regions most affected by the virus (tourists from Lombardy, Piedmont, Veneto, Emilia-Romagna), whereas the international origin of inflow pertained to countries most affected by Covid-19 (tourists from France, UK, USA).

Analysis of the connectivity data has triggered two observations/hypotheses: first, the high percentage of railway and airline connectivity may have led to the more conspicuous spread of the virus, which in turn has led to the second observation/hypothesis, i.e. the reopening of regional borders for tourism purposes could also be linked to the spread of the virus (especially with regard to the two islands).

The highest number of coronavirus cases occurred in the regions with the highest rate of mobility and connectivity - a sign that a possible correlation between the two variables exists, which could explain why the number of infections was so disproportionate, compared to the rest of Italy. This hypothesis could be refuted based region of Lazio, which exhibited high rates of mobility and connectivity, in terms of both the railway and the airline passenger transport. As such, it could be concluded that the potential high risk of contagion, deriving from the connectivity factor, was inexorably linked to the population density, i.e. in province distribution, Lombardy exhibited much greater population density than Lazio, as noted in the chapter dedicated on the socio-demographic analysis. This, along with the high rate of commuting, which did not stop entirely during the lockdown, most certainly contributed to Lombardy's higher number of infection cases (compared to Lazio).

As far as the second observation/hypothesis is concerned, the data on the tourist place of origin indicates a certain degree of vulnerability during the most acute phase of the pandemic, with high percentages of inflow from the regions/countries most affected by the virus.

The above-analyzed data shows that the reopening of regional and international tourist mobility to the two islands could constitute a double high-risk factor. Considering the typical licentiousness of tourist activity, the significant flows of tourists from areas characterized by high levels of coronavirus cases could have contributed to the distribution of the virus onto the island territories, which were not particularly well equipped healthcare-wise, as well as to the spread of the virus among tourists in other territories, who possibly triggered new and unexpected outbreaks after returning to their regions of origin. Consequently, the decision to reopen these areas to tourist mobility, dictated by economic and political reasons, should have been be accompanied by a systematic monitoring of virus outbreaks and capillary tracing of the infected, which requires

adequate structures and personnel. These tourist-receiving territories, however, did not have sufficient support in this regard.

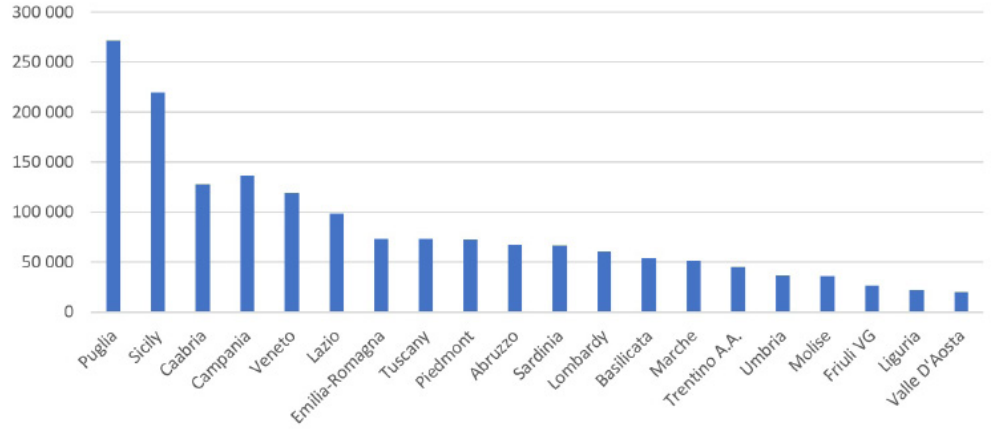
Caution, under these circumstances, seemed necessary, in order to prevent the collapse of the healthcare system in those regions: the need emerged for appropriate tourism planning that would commensurate with the possible risks and the vulnerability of the regions in question. Italian tourism was not only one of the sectors most affected by the negative effects of the mobility reduction and the social distancing, but it also served as a vehicle for the spread of the virus.

## ANALYSIS OF PRODUCTION-RELATED FACTORS

The country's economic structure and sectoral articulation are important factors to be monitored in order to predict the possible evolution of the virus and to manage the consequences thereof. Firstly, the economic activity associated with production of essential goods and with the primary nodes of production and distribution chains cannot be halted, even in the face of an obligatory lockdown and the obvious risk of contagion accompanying the mobility of those involved in the production and the distribution of these goods. Secondly, a potential factor of weakness can be found in the areas that host activities involving national and international markets, which unlike many tertiary activities, for instance, cannot be carried out remotely.

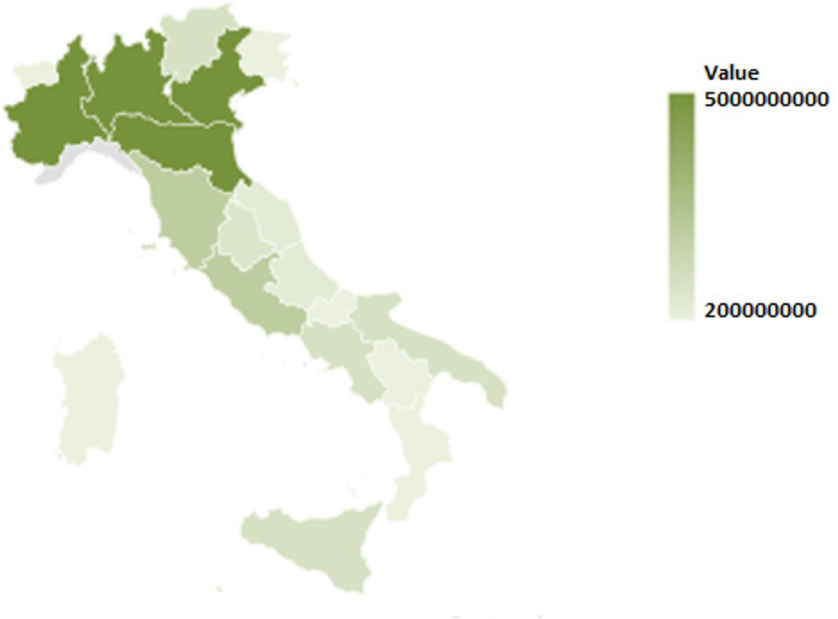
The primary sector of the economy seems to be an economic binder, given its homogeneous impact on the regions (Figure 29, Picture 8). Nevertheless, company sizes in this sector vary, with dispersion in the southern regions and greater concentration in the North. This structure indicates the sector's greater propensity for export and its varying production capacity in terms of the added value.

*Figure 29.* **Agri-food sector (2020)**




*Source*: (Coldiretti Nazionale, 2020).

*Picture 8.* **Regional impact on agri-food export (MLD)**




*Source*: Own elaboration based on the Unioncameregov data.

Based on the data analyzed, out of the € 56 billion in total, 63% of export came from four northern regions: Piedmont, Lombardy, Veneto and Emilia-Romagna. This data, however, should be interpreted from the perspective of the large material infrastructure gap that has negative impact in the South. The share of the agri-food export, in regional distribution, is also an interesting factor: 29% Veneto, 26% Emilia-Romagna, 24% Lombardy and 21% Piedmont (Figures 30).

*Picture 9.* **Secondary sector's impact on regional GDP**


*Source*: (Confederazione Generale dell' Industria Italiana, 2020).

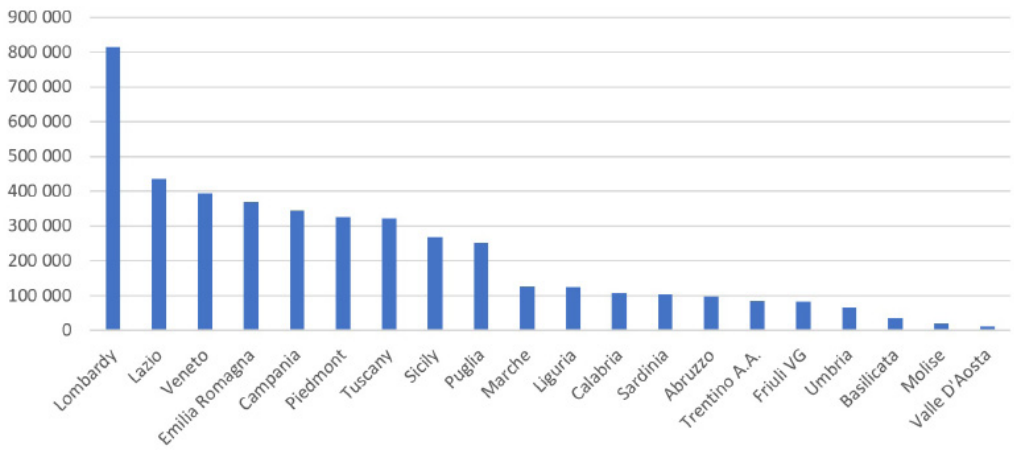
The Covid-19 pandemic most certainly posed a challenge for this sector, nevertheless, since its operationality is of primary significance for domestic procurement, it was not subject to the restrictions imposed on other production-related activities. The fact that the trade balance for the first quarter of 2020 showed a negative value for ex-

port was not without significance, which is why the government had to intervene by implementing various measures to ensure liquidity of agricultural companies, in order to maintain proper functioning of global and national supply chains, and by addressing the issue of the regularization of seasonal/migrant workers in this sector.

The secondary (industrial) sector, with more than half of all companies in this sector located in the northern regions, showed no such homogeneity. The average percentual impact on the regional GDP was: 35% for the northern regions, 23.1% for the central regions and 11.3% for the southern regions (Picture 9).

The companies in this sector are characterized by reliability and thus by higher propensity for export, which distinguishes them on international markets.

*Figure 30.* **Number of companies (absolute values)**




*Source*: (Confederazione Generale dell' Industria Italiana, 2020).

The secondary sector, unlike the primary sector, is subject to strong impact by situations of crisis, such as the global spread of Covid-19. In fact, many sectors were affected by the containment measures imposed by the government at the time of lockdown, with 7.8 million incapacitated workers (56% of that number in the North), excluding

workplaces that were able to comply with all the containment measures. Only 'essential and/or strategic' activity was excluded from following these measures, nevertheless, immediate repercussion on the budgets of each production-related business activity was inevitable. In the first quarter of 2020, prior to the pandemic evolution in the following months, the Chambers of Commerce recorded a drop in the number of companies (30 000 companies closed nationwide), whereas the General Confederation of Italian Industry forecasted a loss of up to 1 million workers.

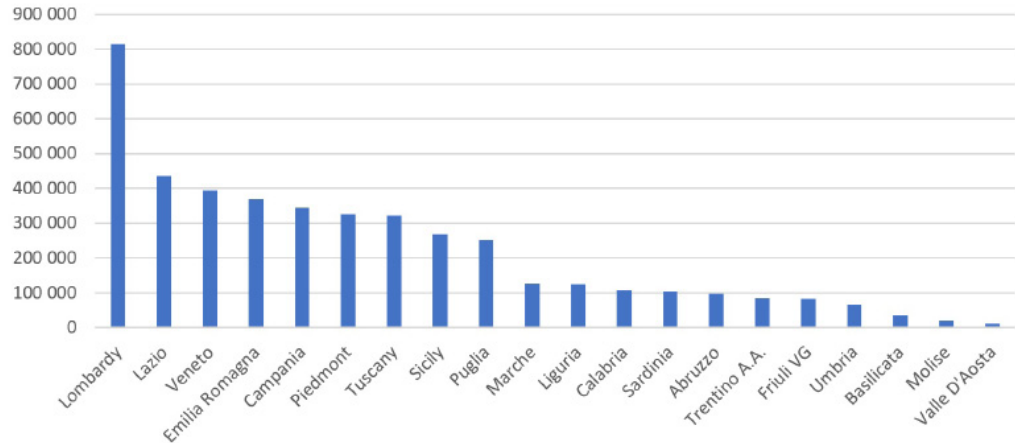
In the years 2008-2017, a process of production outsourcing took place in Italy, which was detrimental to the secondary sector (the total occurrence density for this sector varies from approx. 80% in Lazio to 60% in Marche and Abruzzo) (Picture 10).

*Picture 10.* **Tertiary sector's regional distribution**


*Source*: Own elaboration based on the ANCI data (Associazione Nazionale Comuni Italiani, 2020).

The Covid-19 epidemic, which rapidly assumed a global dimension, disturbed the Italian economy that had already been stagnant due to geopolitical events (e.g. Brexit) and cyclical events (the demand slowdown in Germany), which, starting the second half of 2018, began to cause growing uncertainty (Figure 31). Such shrinkage of a sector that plays crucial role in the generation of the country's wealth results in serious social and economic repercussions and thus necessitates actions aimed at supporting the economy.

*Figure 31.* **Italian GDP (absolute values)**




*Source*: Own elaboration based on the ISTAT data (ISTAT, Istituto Nazionale di Statistica, 2020).

## CONCLUSION

The state of emergency that began to affect Italy in March 2020 was grounded in complex causes and implications. Many factors contributed to the spread of the pandemic and to the varying regional trends. The epidemic epicenter was in the richest, most interconnected, most industrialized and most densely populated

region of the country – Lombardy. The delays in the introduction of restrictive measures and the associated misunderstandings, the ineffective policies as well as the resulting political pressure contributed to the pandemic disaster (failure of the healthcare system) and the incredible loss of human life witnessed in the spring of 2020.

Italy's peculiar distribution of the population and of the production sectors, owing to which the strongly anthropized regions with extensive territorial areas characterized by a high population density (as in the case of many provinces in Lombardy) and by well-developed connectivity on an infrastructural and an economic level, was the factor triggering the 'explosion' of the virus spread, also because the government reacted slowly to the crisis and the healthcare system turned out to be unprepared. The southern regions, despite its less efficient healthcare system, and perhaps precisely because of that, reacted fast, implementing with draconian measures, and thus managed to contain the spread of the virus, also owing to the time advantage. Based on the analysis carried out, it can be seen that the increased magnitude of the restrictive measures resulted in a decrease in the number of coronavirus infections and a reduction in the load on healthcare-providing facilities. The more or less homogenous demographics, characterized by high average density but lower dispersion of the population and strongly concentrated in large urban areas surrounded by large buffer zones of low density, constituted a protective factor, in addition to the relatively low economic dynamics reflected in the lower territorial mobility and in the reduced international connectivity. Finally, the peculiar distribution of economic sectors allowed minimized travel during the lockdown, which ultimately reduced the spread of the virus.

Despite the fact that the WHO had been voicing the high probability of a global pandemic crisis ever since 2003, the condition of the Italian healthcare system, characterized by reduced funding

and investments in private structures, was unprepared to proficiently deal with a pandemic crisis of this magnitude.

It is therefore reasonable and imperative to develop and implement a health emergency plan, which must be managed more efficiently on the national level, so that epidemiological threats of this caliber can be approached and dealt with faster and more effectively. This will only be possible through intensification of technological innovation and new, more productive and resourceful investments in prevention and research.

# PART II

# COVID-19: THE CASE OF POLAND

*Anna Dziadkiewicz*

# CHAPTER 1

# The Covid-19 pandemic in Poland, with particular emphasis on the Silesia region

## INTRODUCTION

The coronavirus SARS-CoV-2 causing COVID-2019, although discovered only in late 2019 in the Wuhan area (the Hubei Province in China), became a global public health threat as early as in January 2020. The first in Poland case of the virus was confirmed on the 4th of March 2020. Due to the spread of virus infections, the need emerged to analyze the perception of the problem, with particular emphasis on the economic and the social situation in Poland. This analysis is preliminary and signaling in character - facts quickly become outdated, while social attitudes keep changing, all the more so, as the so-called second wave of the disease was expected in early autumn 2020.

## THE SPREAD OF CONTAGION

The coronavirus SARS-CoV-2 causes pneumonia, called COVID-19. The incubation period of the virus, i.e. the time from the contagion to the appearance of the first symptoms of the disease, lasts from 1 to 14 days. According to the data from February 26th, 80% of deaths were among the elderly over 60 years of age. Detailed data on the February-July 2020 period is presented in Table 3 and Figure 32.

*Table 3.* **Cumulative number of coronavirus (COVID-19) cases, January to July 2020**

| | **Februay 26, 2020** | **Globally** |
|---|---|---|
| Overall number of cases in the world | over 81 thousand | 18 354 342 |
| Overall number of cases in Europe | 384 | 3 451 556 |
| Overall number of deaths in the world | 2763 | 771 518 |
| Overall number of deaths in China | 2718 | 4 683 |
| Overall number of deaths in Europe | 12 (11 in Italy, 1 in France) | 214 731 |

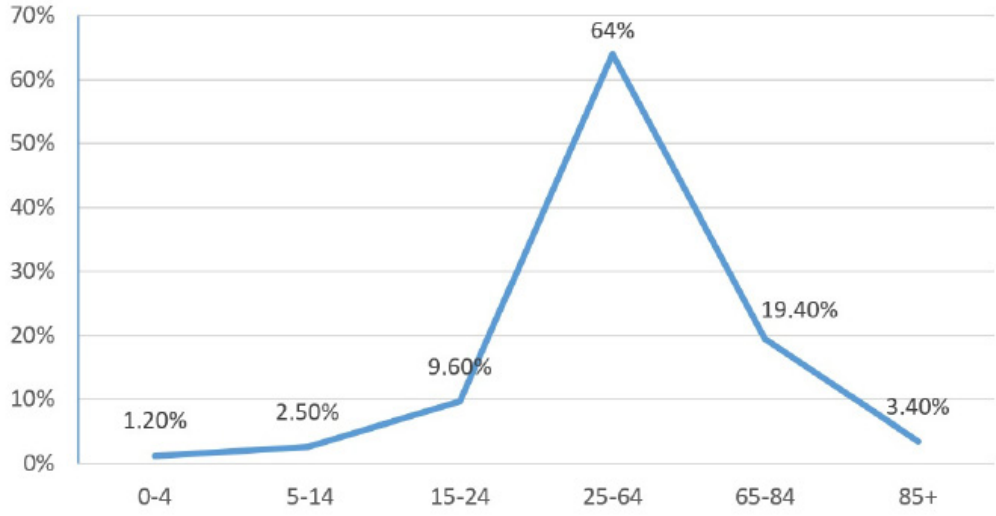
*Source*: (World Health Organization, 2020).

Due to the epidemic[1] (Leowski, 2004) the Chief Sanitary Inspector advised, as early as February 2020, against travelling to China and South Korea as well as to Italy (in particular Lombardy,

[1] An epidemic is the incidence of infectious disease over a certain period of time, in a certain area, in an above-average number. A pandemic is the spread of a disease on many continents at the same time. A pandemic occurs when there are secondary outbreaks of infection on at least two continents. It is characterized by a high infectivity (mainly droplet transmission) with a low mortality rate.

Veneto, Piedmont, Emilia-Romagna, Lazio) and Iran, Japan, Thailand, Vietnam, Singapore and Taiwan.

*Figure 32.* **Age distribution of confirmed COVID-19 cases, COVID-19 WHO surveillance, January to July 2020**




*Source*: (World Health Organization, 2020).

In the beginning of the pandemic, the Ministry of Health, following the WHO (World Health Organization), recommended frequent and thorough hand washing as a basic method of protection against the virus. Comparatively, in the case of the SARS virus (a coronavirus much more dangerous than the current one), hand washing reduced the risk of infection by 30-50%. It was also recommended to use alcohol-based liquids, gels and sprays for disinfection. On April 16th, the obligation to cover the nose and mouth in public space was introduced. The WHO pointed out that masks are only effective in combination with such methods of prevention as frequent hand washing or disinfection.

## POLAND BEFORE THE PANDEMIC

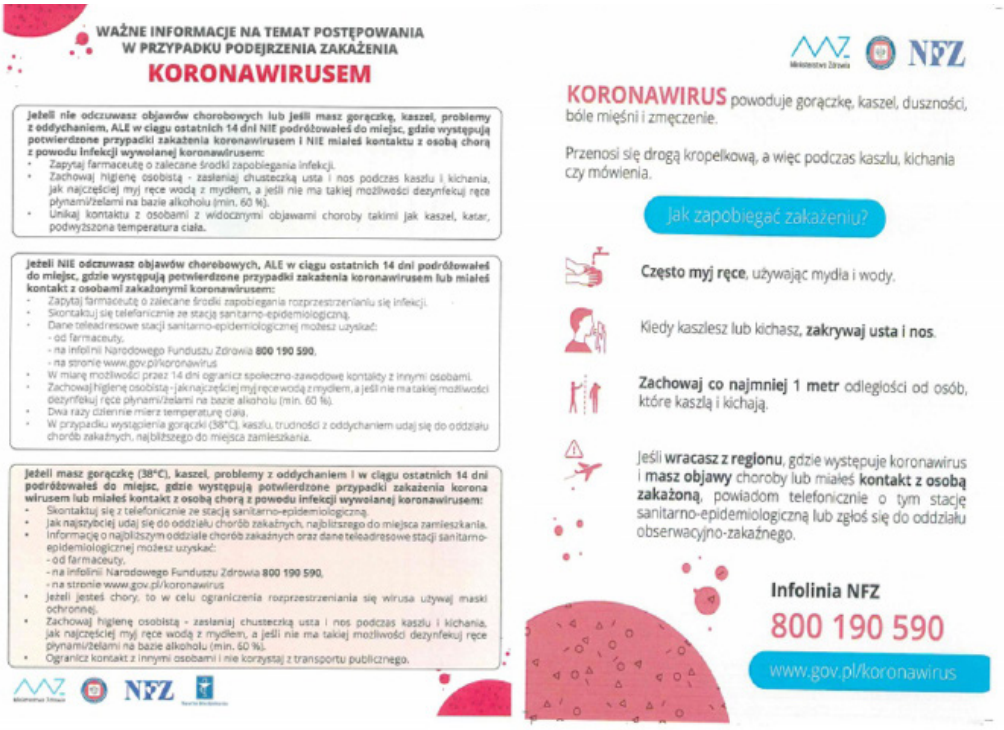
Before the outbreak of the epidemic, the rules of proceeding in Poland had been laid down in the Act on Prevention and Control of Infections and Infectious Diseases among Humans. Poland, just as the entire European Union, also received international recommendations. According to Prof. Włodzimierz Gut[2], owing to the collection of information about all persons coming from endangered regions, tCovid-19 procedures could be implemented quickly. In his opinion, the flu is more dangerous than the coronavirus: up until the pandemic outbreak in Poland, from mid-February 2020 to the end of the month, 200 thousand people fell ill with influenza, 9 of whom died. The mortality rate for influenza is 0.5-1%, while the Wuhan virus kills 2-3% of the infected. Compared to Italy, which is a special case, as of early spring 2020, Poland did not need to fear high mortality. According to Prof. Gut, Italians did not manage to react properly during the phase of a slow increase of coronavirus cases. They wisened up when the virus dispersed. This is the so-called logarithmic phase. What is more, the Italians did not identify the so-called zero patient, the one whom the others began to get infected from. Generally, more infection cases actually exists than it is known, while information in this regard usually is reported too late. That is why patients in severe condition end up in hospitals and some of them die.

The virologists in Poland indicated that it is most crucial to track down the first cases in the early stages of the disease. Apart from hygiene, there is little that could be done to prevent contagion, especially that as of early fall 2020, the cure for coronavirus was still not found. Information on how to counteract the infection therefore appeared in traditional and digital media (Picture 11). A special Na-

[2] Professor Włodzimierz Gut - biologist, microbiology and virology specialist, in the past, participant of the research on infectious diseases conducted by the World Health Organization (WHO).

tional Health Fund hotline (+48 800 190 590) was set up, to provide information on how to deal with suspected infections.

*Picture 11.* **Information on the treatment of suspected coronavirus infection**




*Source*: (Koronawirus: informacje i zalecenia, 2020).

The posted issued by the government (Picture 11) provides basic information for the public, divided into three parts:

- information for persons who did not have any symptoms or who had a fever, cough or breathing problems, but had not traveled to places of confirmed coronavirus cases and had not had contact with an infected person in the last 14 days;

- information for persons who did not feel sick, but who in the last 14 days had travelled to places of confirmed coronavirus cases or had had contact with an infected person;
- information for persons who had a fever (38°C), cough, breathing difficulties, and who in the last 14 days had travelled to areas of confirmed coronavirus cases or had had contact with an infected person.

Methods of infection prevention are shown further on Picture 12.

At the end of February 2020, the coronavirus epidemic in Poland was not yet noticeable, but companies had already started to prepare for it. Masks and antibacterial fluids were purchased. Employees were informed that when the epidemic occurred, most likely they would work remotely or in a hybrid system (a mixed system, e.g. 2 weeks of work, followed by remote work at home for one group of employees, while another group was to work remotely and then in a regular manner - the idea was that if coronavirus infection was confirmed in one group, all employees in contact with that person had to undergo a 14-day quarantine at home). Many companies set up emergency procedures for the event of production line closure and suspension of branch office activity, both in Poland and abroad. Cleaning companies and the transport industry introduced guidelines on the use of antiviral masks, the use of antimicrobial hand soaps and antiseptic liquids, increasing the frequency of disinfection of door handles and any handles for that matter. Experts suggested that corporations limit their work in open-space offices, delegating remote work from home.

At the beginning of February 2020, Poland's readiness for the 'real threat of an epidemic' was inspected by the Supreme Audit Office[3].

[3] Pursuant to the Constitution, the Supreme Audit Office (Polish: Najwyższa Izba Kontroli, NIK) controls, from the perspective of legality, the efficiency, purposefulness and reliability of the activities of government administration bodies, the National Bank of Poland, state legal entities and other state organizational units. The Supreme Audit Office can control, from the perspective of legality, the economic aspects and the reliability of the activity of local government bodies, municipal legal persons and other municipal

A special open session of the Sejm[4] was convened, during which appropriate legislative actions were taken, such as the possibility of amending the legislation, as to facilitate the preparation for and the possible fight against the coronavirus, inter alia, introduction of no limitation on the benefits related to preparatory activity.

A decision was made that, in case of an epidemic, all doctors in the country could be mobilized. By the decision of a governor or the Minister of Health, all medical personnel could be recruited (all over Poland), regardless of their specialization. 79 wards and infectious disease hospitals were designated to care for the infected. There were about 3000 beds and about 500 doctors with infectious disease specialization. If necessary, quarantine facilities were to be established in boarding houses and stadiums. The government reserved 200 million PLN for the fight against the coronavirus. The State as well as each voivodeship have developed plans of action, which assumed hospitalization of patients also in other hospital wards, in case of mass outbreaks. In the need of quarantine facilities, local authorities could decide to take over, for this purpose, hotels, boarding houses, stadiums, sports centers, dormitories, etc. The quarantine decision was to be made by a sanitary officer. Resources should be made available to hospitals (in theory) by the Material Reserves Agency, which gathers the reserves needed for various threats. It turned out, however, that the Agency did not

organizational units. It can also control, from the perspective of legality and economics, the activities of other organizational units and business entities, with regard to the use of state or municipal property or funds as well as the fulfilment of those institutions' financial obligations to the state

The NIK is the top independent state audit body, whose mission is to safeguard public spending. For over 90 years, NIK has looked into the way the Polish state operates and how it spends public funds. The mission of the Supreme Audit Office is to foster sound management and effectiveness in the public service for the benefit of the Republic of Poland. The vision of the Supreme Audit Office entails a widely-recognised Supreme Audit Institution, whose reports are a long-needed and sought-after source of information for the state authorities and the public. (The Supreme Audit Office, 2020).

[4] The lower house of the bicameral parliament of Poland, officially known as the Sejm of the Republic of Poland

have adequate reserves. Similar chaos concerned family doctors, who in February had not yet received any guidelines on how to deal with persons suffering from the coronavirus, while it was them who were the first to be exposed to contact with infected patients (although the Sanitary-Epidemiological Station recommended patients to seek direct contact with infectious wards). Pharmacists, whom the Ministry of Health was only just about to prepare the guidelines for, also complained about the lack of guidelines.

According to the governors' report, which was sent to the Ministry of Health at the end of February, there were 83 hospitals in Poland, with 105 infectious wards and a bed occupancy rate of nearly 2.5 thousand 'infection' beds. Additionally, there were 2977 'observation' beds (Kowalska, 2020). Prof. Robert Flisiak, President of the Polish Association of Epidemiologists and Infectious Disease Doctors (Polish: Polskie Towarzystwo Epidemiologów i Lekarzy Chorób Zakaźnych), said that there are not enough beds: "It is an iron rule of thumb that every patient, whether under observation or in quarantine, or with an already established infection, should have a separate room" (Kowalska, 2020). [translated from Polish by Anna Dziadkiewicz].

The Polish National Association of Mechanical Ventilation Service Providers (Polish: Ogólnopolski Związek Świadczeniodawców Wentylacji Mechanicznej) warned that in case of an epidemic outbreak, a problem with access to respirators may emerge. "Unfortunately, China has purchased virtually the entire range of the products available on the global market and we will have to deal with what we have in Poland" [translated from Polish by A.D.] - warned the head of the Association, Dr. Robert Suchanke. The Ministry of Health, however, warranted that the preparation of intensive care units for patients with respiratory failure was monitored on an ongoing basis.

According to economists, as of early spring 2020, concerns were raised that Polish economy could be seriously affected by the coro-

navirus. The gross domestic product growth rate could be reduced by 1.2% (*Epidemia koronawirusa*, 2020). The black scenario allowed for two quarters of GDP decline, the so-called technical recession. Expenditure on durable goods (e.g. consumer electronics, household appliances, cars), clothes and shoes as well as on recreational, cultural and gastronomic services were predicted to decline the most. Increased uncertainty would also contribute to a decrease in investments (by 0.2% year-on-year). Due to the persistent constraints in the functioning of households as well as the possible further expansion of precautionary measures (e.g. restaurant and shopping mall lockdowns and movement restrictions), economists forecasted a clear decline in consumption in the second quarter, by 3% year-on-year.

In the opinion of economists, as of early fall 2020, the coronavirus outbreak could be disruptive to global supply chains, due to the suspension of production in China, reducing the demand for Polish goods in China and Italy as well as limiting the export of components manufactured in Poland to Germany. Trade fairs and other mass events were cancelled worldwide, which means that fair-participating companies could lose up to PLN 500 million. More than 618 events were cancelled or rescheduled in Europe, Asia and America.

Despite the reassuring messages coming from the government, Poles, in fear of the epidemic, started to buy food, water and over-the-counter medications en masse. Masks, which despite the fact that the Minister of Health, Łukasz Szumowski, a few days earlier had assured everyone were not effective in preventing infection, almost completely disappeared from pharmacies. Many pharmacies posted information on their doors about the lack of disinfectants, inter alia, hand gels. Apart from the masks, pharmacy customers, also bought vitamin C, nasal sprays and medications alleviating the symptoms of cold - said Marek Tomków, Vice-President of the Supreme Pharmaceutical Council (Polish: Naczelna Rada Aptekarska) (Siemonczyk 2020).

In March, planned admissions got suspended in most hospitals. Most commonly, only emergency cases, cancer patients and patients on dialysis were admitted. Many hospitals also introduced a ban on visits.

According to tour operators, as of early spring 2020, the pandemic possibly was to have disastrous consequences. Travel to Poland was cancelled as early as in March – pre-booked groups of tourists from European countries, Asia and America were cancelling their trips. The coronavirus also grounded the transport companies serving tourists. More than 300 coaches, operated by Polish companies transporting tourists around Europe, had to return to Poland, while some of the drivers were sent on unpaid leaves. "Every summer, about 600 Polish coaches transport tourists from China around Europe (10- or 14-day trips). The buses are operated by travel agencies that target this group of tourists exclusively and will not be able to change this quickly" [translated from Polish by A.D.] - says Adam Gąsior, the head of a tourism industry portal Waszaturystyka.pl. All domestic tours, especially those organized for schools, were cancelled. After the Ministry of Education issued its recommendation, 75% of school trips were cancelled.

The threat of an epidemic also hit the hotels, where the number of guests, especially corporate customers on business trips, began to decline day by day. In March 2020, some hotels experienced a decrease in the number of guests by about 20%, compared to the previous year. Ireneusz Węgłowski, President of the Chamber of Commerce of the Polish Hotel Industry (Polish: Izba Gospodarcza Hotelarstwa Polskiego) announced that if the spread of the virus lasted longer, part of the hotel industry could record losses throughout 2020 (Woźniak, 2020). Some companies hoped, however, that the situation would calm down in May and that starting June, the demand would begin to return to the previous level. According to Andrzej Betlej (President of the Instytut Badań Rynku Turystycznego TravelDATA, an institute for tourism market research), tour

prices in March remained at the level of those in 2019, while cases of holiday tour cancellation were scarce. Almost 10% declines were noted in the offers for the upcoming period, but in March and April 2019, the number of charter clients did not exceed 80 thousand it only increased to about 230 thousand in May 2019. In March 2020, travel agency owners pointed out that they were most afraid of further restrictions and a prolonged crisis. The tourism industry tried to get support for crisis-affected companies, using money from the Tourist Guarantee Fund[5]. The World Travel and Tourism Council (ETTC), however, estimated the industry's revenues to fall, on a global scale, by 22 billion dollars in 2020.

The virus also ruined the hoteliers' and tour operators' plans to attract tourists and pilgrims to Poland on the occasion of the Papal Year. April 2nd was the 15th anniversary of the death of John Paul II, while May 18th was the 100th anniversary of Karol Wojtyla's birthday. This was supposed to promote travel of Poles to Rome and arrival of foreign tourists to Poland, including those from Italy. As early as in February 2020, the sale of tickets for the 18th Chopin Competition qualifying rounds was suspended. Rafał Jańczuk, President of the Polish Association of Coach Carriers (Polish: Polskie Stowarzyszenie Przewoźników Autokarowych), noted that industry's revenues decreased in February and March by 97% (Woźniak, 2020).

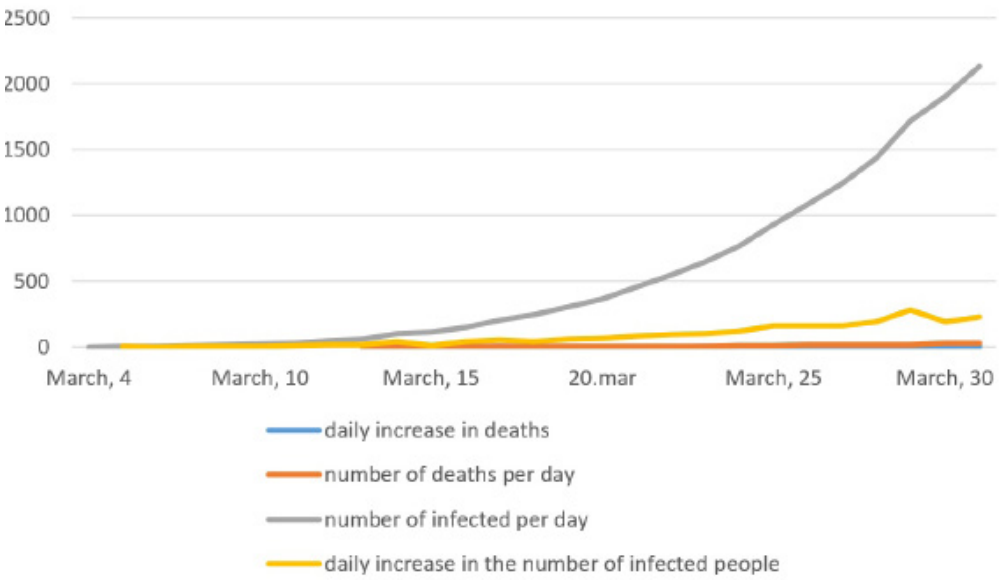
[5] It is an additional security for customers in the event of a travel agency becoming insolvent. TGF funds are used to cover the costs of returning to the country and reimbursement of payments for unrealized and interrupted tourist events. The fund is the second pillar of insurance, introduced along with the amendment to the Act of November 2017 on Tourist Events and Linked Travel Arrangements (Journal of Laws 2017, item 2361).

## POLAND IN THE STATE OF EPIDEMIC THREAT

On March 4, 2020, the media received information about the first coronavirus case in Poland. In Poland, the state of epidemic emergency[6] was announced on March 16, 2020, whereas the WHO announced a worldwide state of pandemic on the 11th of March 2020. The number of infections started to increase overnight.

The first coronavirus-related death was recorded in Poland on the 12th of March 2020. The statistics regarding the March development of the pandemic in Poland are presented in Figure 33 and Table 4.

*Figure 33.* **Daily COVID-19 incidence and morbidity statistics - March 2020**




*Source*: Own elaboration.

[6] The state of epidemic emergency allows the Minister of Health to introduce special restrictions on the movement of people and the way in which certain products can be moved, as well as restrictions on the marketing of certain products.

*Table 4.* **Daily COVID-19 incidence and morbidity statistics - March 2020**

| | daily increase in deaths | number of deaths per day | number of infected per day | daily increase in the number of infected people |
|---|---|---|---|---|
| March 4 | | | 1 | |
| | | | 5 | 4 |
| | | | 6 | 1 |
| | | | 11 | 5 |
| | | | 16 | 5 |
| March 10 | | | 22 | 6 |
| | | | 31 | 9 |
| | | | 47 | 16 |
| | | 1 | 61 | 14 |
| | 2 | 3 | 103 | 42 |
| March 15 | 0 | 3 | 111 | 8 |
| | 0 | 3 | 150 | 39 |
| | 2 | 5 | 205 | 55 |
| | 0 | 5 | 246 | 41 |
| | 0 | 5 | 305 | 59 |
| March 20 | 0 | 5 | 367 | 62 |
| | 0 | 5 | 452 | 85 |
| | 0 | 5 | 547 | 95 |
| | 2 | 7 | 649 | 102 |
| | 1 | 8 | 766 | 117 |
| March 25 | 4 | 12 | 927 | 161 |
| | 3 | 15 | 1085 | 158 |
| | 0 | 15 | 1244 | 159 |

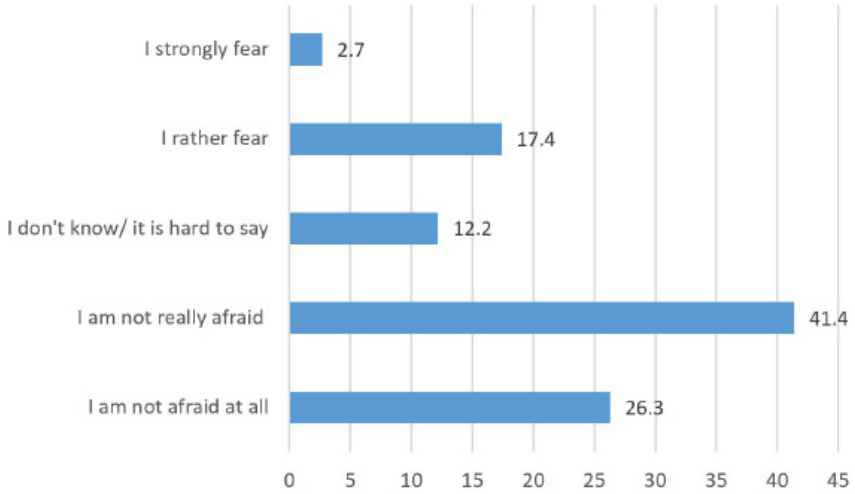
| | | | | |
|---|---|---|---|---|
| | 1 | 16 | 1436 | 192 |
| | 3 | 19 | 1717 | 281 |
| March 30 | 7 | 26 | 1905 | 188 |
| | 5 | 31 | 2132 | 227 |

*Source*: Own elaboration.

Due to the appearance of the first coronavirus cases in Poland and the changing global situation, early in March 2020, the government decided to introduce restrictions for citizens. The borders were restored within the EU, along with border control for the persons returning to Poland, who had to undergo a mandatory 14-day quarantine. Foreigners were banned from entering Poland. International passenger flights were suspended. Food stores, drugstores and banks were still open. Stores in shopping malls (except grocery stores, laundries, pharmacies and drugstores) were closed. Events that exceed 50 people were prohibited. Bars, restaurants and pubs were closed. Restaurant food could only be ordered for takeout. Export of painkillers, antivirals and antipyretics was forbidden. This ban also included masks, surgical caps and the medical equipment needed to combat the coronavirus.

Despite the growing number of infected people in Poland, there was no panic. According a survey carried out by the IBRiS Market and Social Research Institute on March 10, 2020, only every fifth Pole expected to get infected with the coronavirus (Figure 34). The survey was conducted on March 6th, two days after the first Pole, who returned from Germany, tested positive for COVID-19 and was taken to a hospital in Zielona Góra. Only 2.7% of the respondents were actually afraid that they would contract the virus.

*Figure 34.* **The Poles' apprehension toward coronavirus contraction (%)**



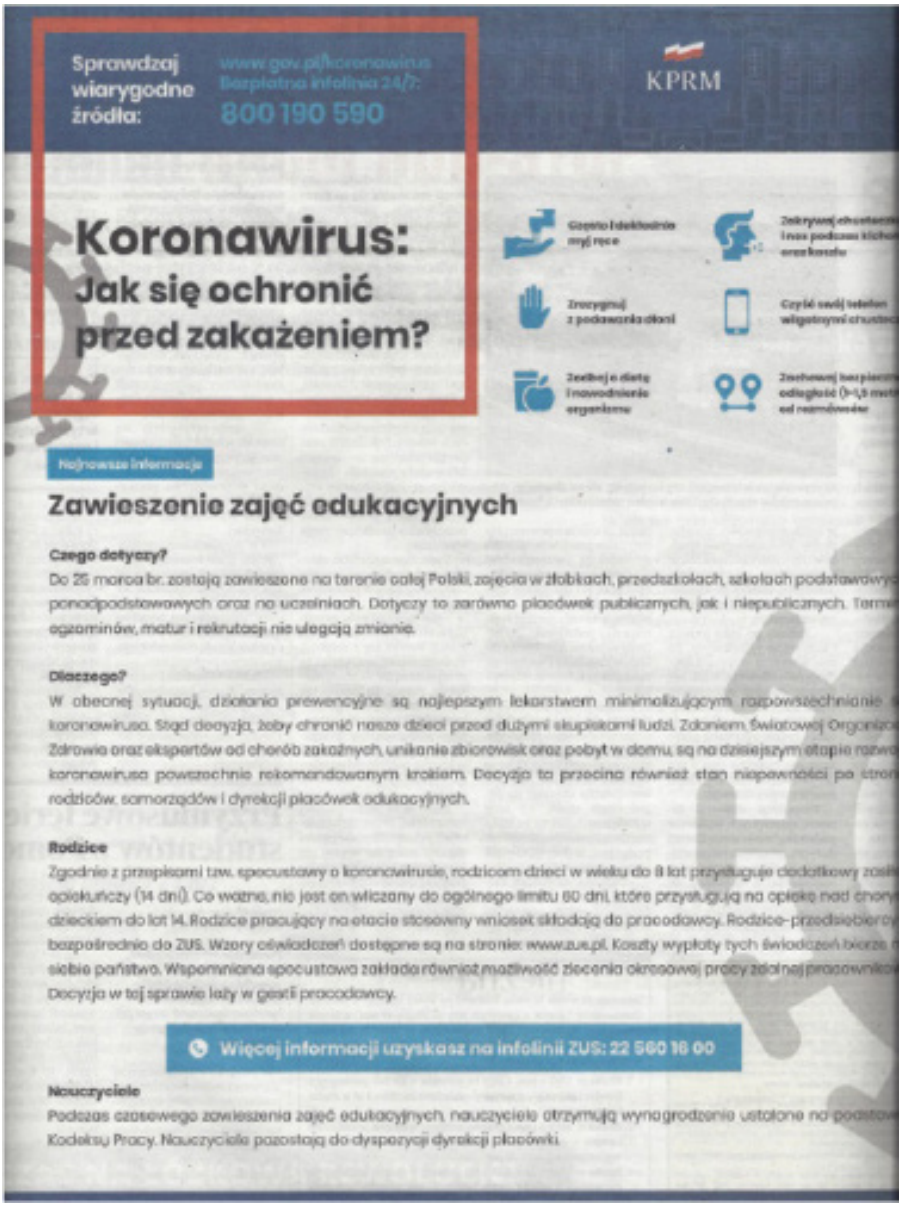

*Source*: Research carried out by the IBRiS Market and Social Research Institute on a 1100-person national sample (Ćwiek and Kacprzak, 2020).

On the 10th of March 2020, after the meeting of the Government Crisis Management Team, the Polish Prime Minister, Mateusz Morawiecki, cancelled all mass events[7]. Nevertheless, cinemas, theaters, museums, operas, philharmonics, community centers continued to function, just as corporate events organized by employers for employees were not cancelled. A week later (March 16th) a decision was made to close all schools, kindergartens and nurseries, while on March 25th, remote teaching was introduced. Schools and universities, zoos, municipal swimming pools, theaters and cinemas were also closed starting that day. Colleges and universities suspended international student exchange programs and introduced remote teaching. Preventive measures were considered the best way to minimize the spread of the coronavirus, hence the decision to keep children away from large groups of people. The poster presented

[7] Mass event - a cultural and educational event, for which the organisers have allocated more than 1000 seats in open air or 500 seats in a club. For sports events, it is more than 1 thousand seats in open air and 300 seats indoors.

in Picture 12 shows information about the suspension of educational activities as well as information for parents and teachers.

*Picture 12.* **Poster with information for Polish citizens**




*Source*: (Dziennik Bałtycki, 2020)

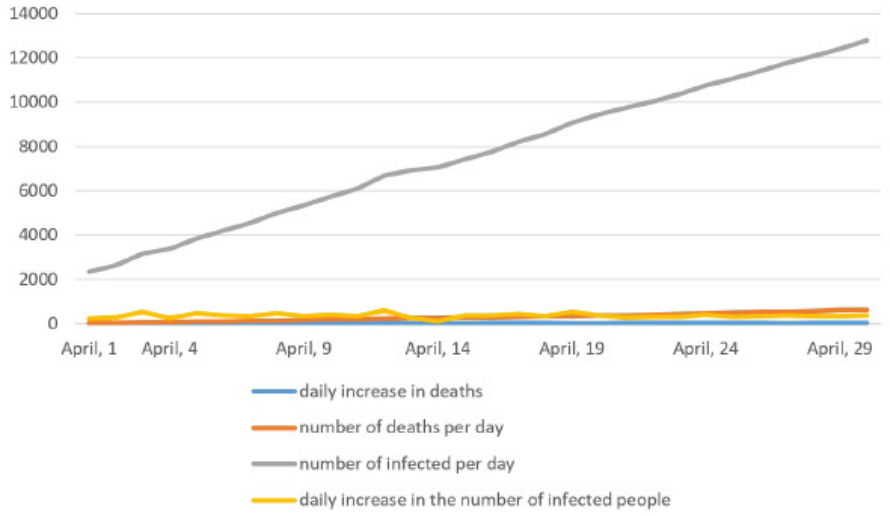
The lockdown of nurseries and children's clubs (on March 12th) and schools (on March 16th) resulted in complications for millions of employees. Parents or legal guardians of children under 8 years of age (about 3 millions), who at the time were covered by medical insurance, were entitled to care allowance. Additional care allowance was available to parents for a total of 14 days, regardless of the number of children requiring care. The allowance could not be used longer than the day before the child's eighth birthday. Parents could share the care of the child within the 14-day limit. The additional allowance was 80% of the salary. For older children, school activities were provided, not in form of classes, but as outdoor activities in small groups. Parents of older children (up to 14 years of age) could also take a leave.

The new restrictions introduced in Poland were in force from the 25th of March 2020 to the 11th of April 2020. During this time, leaving the house was kept to an absolute minimum. People could only go out for grocery shopping (for themselves or for the elderly) or to work. Only two people were allowed to walk next to each other on the street (this restriction did not apply to families with children). Meetings on boulevards and in parks or playgrounds were forbidden. Violation of this rule was punishable by a financial penalty of up to PLN 5 thousand. Public transportation was also restricted in terms of seating. Only half of the seats could be occupied. Masses and the funerals could be attended by up to 5 persons.

Sanitary control was also introduced at border crossings. Persons crossing the border had their temperature measured and had to fill the so-called location forms that expedited the tracking of people, if one of the travelers turned out to be infected. Sanitary control also encompassed the persons travelling by ferries and long-distance trains.

On April 2nd, the number of coronavirus cases worldwide exceeded 1 million. On April 8th, the number of cases in Poland exceeded 5 thousand (see Figure 35 and Table 5).

*Figure 35.* **COVID-19 incidence and morbidity statistics in April 2020**




*Source*: Own elaboration.

*Table 5.* **Death and infection statistics in April 2020**

| | daily increase in deaths | number of deaths per day | number of infected per day | daily increase in the number of infected people |
|---|---|---|---|---|
| April 1 | 4 | 35 | 2347 | 215 |
| | 7 | 42 | 2633 | 286 |
| | 21 | 63 | 3149 | 516 |
| April 4 | 8 | 71 | 3383 | 234 |
| | 13 | 84 | 3834 | 451 |
| | 14 | 98 | 4201 | 367 |
| | 13 | 111 | 4532 | 331 |
| | 25 | 136 | 5000 | 468 |
| April 9 | 28 | 164 | 5341 | 341 |
| | 11 | 175 | 5742 | 401 |
| | 20 | 195 | 6088 | 346 |
| | 37 | 232 | 6674 | 586 |

| | | | | |
|---|---|---|---|---|
| | 13 | 245 | 6934 | 260 |
| April 14 | 6 | 251 | 7049 | 115 |
| | 17 | 268 | 7408 | 359 |
| | 24 | 292 | 7771 | 363 |
| | 26 | 318 | 8214 | 443 |
| | 21 | 339 | 8563 | 349 |
| April 19 | 11 | 350 | 9082 | 519 |
| | 12 | 362 | 9453 | 371 |
| | 23 | 385 | 9737 | 284 |
| | 19 | 404 | 10034 | 297 |
| | 31 | 435 | 10346 | 312 |
| April 24 | 28 | 463 | 10759 | 413 |
| | 36 | 499 | 11067 | 308 |
| | 27 | 526 | 11395 | 328 |
| | 13 | 539 | 11761 | 366 |
| | 31 | 570 | 12089 | 328 |
| April 29 | 36 | 606 | 12415 | 326 |
| | 22 | 628 | 12781 | 366 |

*Source*: Own elaboration.

As the number of infections and deaths began continued to rise at the beginning of the month, the government begun to gradually introduce restrictions in the number of customers in stores and public offices as well as constraints on employee behavior and movement of people. Picture 13 shows a poster that provided information about further restrictions.

The above-described restrictions concerned, among others, the number of persons allowed in stores and service facilities - starting April 1st, there were to be a maximum of 3 persons per cash register. Each store (both small-format stores and large supermarkets) as well as each service outlet could be entered by a maximum of as many people as the product of the number of all cash registers and the number 3, e.g. if there are 5 service stations in a bank, 15 customer could enter at a time. Similar restrictions also affected

*Picture 13.* **Poster with information regarding the restrictions introduced on April 1, 2020**


*Source*: (Koronawirus w Polsce, 2020).

fairs, stalls and bazaars. The difference was that the number of people at a fair could not be more than three times the number of retail

outlets. As many persons as twice the number of post office counters could be present at a post office at any one time. Home-improvement and construction stores were closed on weekends, whereas all stores had to adapt to the new, stricter safety rules, i.e. starting the 2nd of April, all customers had to shop in disposable gloves, while from 10:00 a.m. to 12:00 p.m., stores and service facilities provided services only to people over 65 years of age. At other times, stores and service facilities were open to all. Hotels and other accommodation facilities (short-term rental) were closed until further notice[8]. They could only operate, if they were providing accommodation for quarantined or isolated persons and for medical staff. This, however, did not apply to persons on business trips and those who used accommodation services as part of their work duties, for whom hotels remained open.

In April, a study was conducted on the correlation between COVID-19 deaths and the age of the deceased (Figure 36).

As noted, the highest mortality occurred in people over 50 years of age (in this age group the mortality rate in mid-spring 2020 was 1.30%) and was increasing proportionately, while for persons over 80 years of age, the rate was almost 15%.

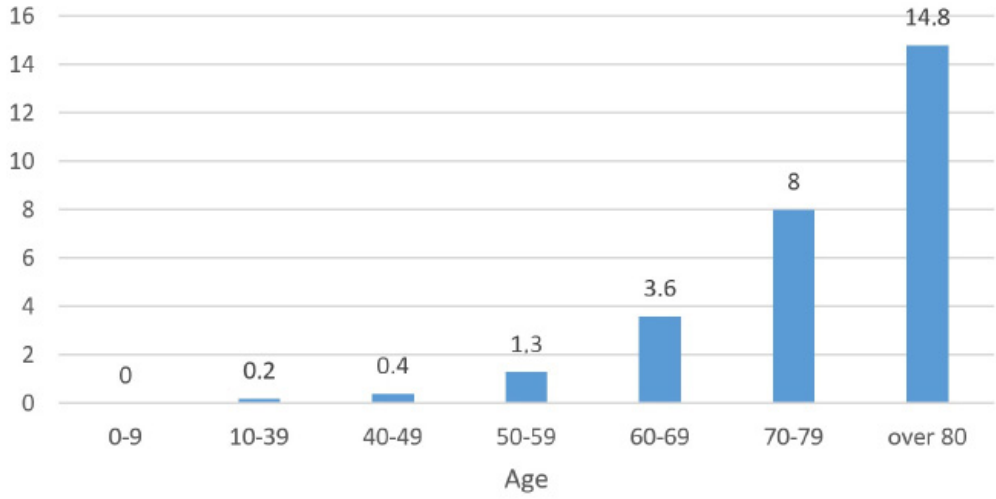
In connection with the above and due to the growing number of infected persons, the list of those who were subject to mandatory house quarantine was expanded. It covered everyone who lived with a person undergoing a quarantine. These rules entered into force on Wednesday, the 1st of April 2020, and applied to those who had lived/stayed in the same flat with a quarantined person. For instance, if one housemate (roommate) was quarantined because they had just returned from abroad or had had contact with an infected person, all housemates (roommates) had to be quarantined.

All hairdressing, beauty, tattoo and piercing salons were

[8] The guests staying at these facilities when the new legislation came into force had to check out by Thursday, the 2nd of April 2020.

closed. Provision of such services was also forbidden outside the above-mentioned establishments (e.g. home visits). Rehabilitation and massages were also suspended, both in public and private facilities, except when it was absolutely required by the patient's state of health.

*Figure 36.* **COVID-19 mortality rate and the age of the deceased [%]**




Source: (Koronawirus Covid-19-ograniczenia, 2020).

Children and adolescents under 18 years of age were banned from leaving home unattended. Only the presence of a parent, a legal guardian or an adult justified their being on the streets.

The previously-introduced restrictions on the movement of all people were maintained. It was still not possible to leave the house, except for:

- commuting to work - employees, business or farm owners had the right to commute to their work. They also had the right to go and purchase goods and services that were related to their professional activity.

- COVID-19 volunteer work - people who work to combat the coronavirus and help the quarantined in need or help those who were advised against leaving their homes could move around as part of such activity.
- everyday life necessities - it was possible to do the necessary shopping, to buy medications, go to the doctor, care for loved ones, take a dog out.

A ban on access to public beaches and green areas was introduced until further notice. The ban covered parks, green areas, promenades, boulevards, botanical and zoos or playgrounds.

The use of city bikes was also restricted. An obligation to maintain at least a 2-meter distance between pedestrians was introduced. This also applied to families and relatives, except for parents with children requiring care (up to 13 years if age) as well as persons with disabilities or unable to move around on their own and their guardians/carers.

Public institutions were to perform their duties remotely, except for activity that could not be carried out in any other way than at the office.

In mass public transport, the principle of 'as many passengers as half of the seats in the vehicle' became applicable. This requirement was also extended to vehicles with more than 9 seats, including non-public transport - e.g. organized transport to work or private passenger carriers. The restriction did not apply to passenger cars.

Employers also had to provide additional safety measures for their employees. For this purpose, individual workstations were separated by min. 1.5 meters and disinfectants were supplied. Employees were required to wear gloves and masks.

Due to the fact that Easter in 2020 fell on April 12$^{th}$, further restrictions were introduced in April, mainly in order to restrict gatherings and travel. The restrictions took effect on the 9$^{th}$ of April 2020. Participation in Easter services was forbidden (masses were broadcast both via television/radio and the Internet). It was not possible to

bless food[9] and no Easter confessions could be held. People were recommended to stay home and spend the holidays with the persons they live with permanently, in order to stop the spread of the new coronavirus. Particular care was taken not to visit seniors. An order was in force to cover the mouth and nose in all public places (on the street, in stores, during walks). It was not possible to drive a car without a mask.

## PHASES OF RESTRICTION ABOLITION

Although the number of the persons infected with coronavirus continued to increase in mid-spring 2020, starting April 20th, some of the restrictions that had been introduced were eased up, due to the country's deteriorating economic situation. Despite the fact that some restrictions were lifted, precautions still needed to be taken, including the obligation to wear protective masks and social distancing.

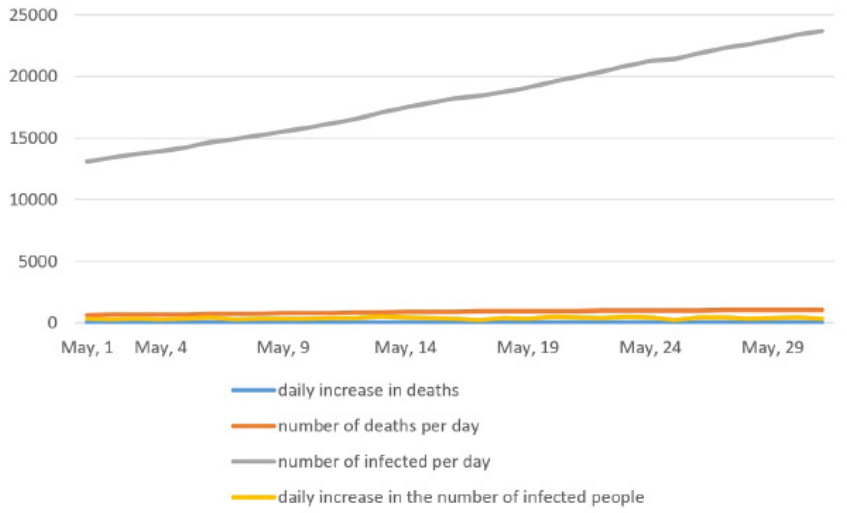
In the first stage of the restriction lifting, the number of persons in stores was increased and parks, forests and places of worship were opened - limit: 1 person per 15 $m^2$. Persons over 13 years of age could move around without guardians. The order to cover the mouth and nose in the public was maintained, while service providers (hairdresser salons, beauty salons, tattoo salons), clothing stores, shopping malls, hotels and accommodation facilities were still closed.

Despite the preservation of the order to wear protective masks in public and to keep social distance, the number of infections continued to increase in May (Figure 37 and Table 6). It was also recommended to wear disposable gloves in service facilities

[9] The tradition of food blessing at Easter has early-medieval roots and derives from pagan rituals. Baskets containing a sampling of Easter foods are brought to church to be blessed on Holy Saturday.

(e.g. stores). Shopping centers, art galleries, libraries, hotels and accommodation facilities were allowed to open, but under a strict sanitary regime (since May, 4th). The 'Senior Hours' from 10:00 a.m. to 12:00 p.m. were terminated. Small childcare groups were allowed in nurseries and kindergartens - for the working parents. Rehabilitation treatment was resumed. The lockup of beauty and hairdresser salons as well as tattoo salons was maintained. Schools and universities continued the remote teaching system. Outdoor playgrounds remained closed.

*Figure 37.* **COVID-19 incidence and morbidity statistics in April 2020**




*Source*: Own elaboration.

On the 13th of May, the Minister of Health, Łukasz Szumowski, held a press conference to explain the reasons for lifting the restrictions: among the indicators that the Ministry used as guidance, he listed the number of infected persons hospitalized, the COVID-19 bed occupancy in hospitals, the number of available respirators and those currently in use, and the rate of virus reproduction - at

the beginning of May it was below 1, which meant a downward trend.

*Table 6.* **COVID-19 incidence and morbidity statistics in April 2020**

| | daily increase in deaths | number of deaths per day | number of infected per day | daily increase in the number of infected people |
|---|---|---|---|---|
| May 1 | 23 | 651 | 13105 | 324 |
| | 13 | 664 | 13375 | 270 |
| | 14 | 678 | 13693 | 318 |
| May 4 | 5 | 683 | 13937 | 244 |
| | 17 | 700 | 14242 | 305 |
| | 23 | 723 | 14647 | 405 |
| | 14 | 737 | 14898 | 251 |
| | 19 | 756 | 15200 | 302 |
| May 9 | 21 | 777 | 15510 | 310 |
| | 14 | 791 | 15821 | 311 |
| | 12 | 803 | 16206 | 385 |
| | 24 | 827 | 16561 | 355 |
| | 20 | 847 | 17062 | 501 |
| May 14 | 22 | 869 | 17469 | 407 |
| | 24 | 893 | 17850 | 381 |
| | 19 | 912 | 18184 | 334 |
| | 7 | 919 | 18394 | 210 |
| | 10 | 929 | 18746 | 352 |
| May 19 | 12 | 941 | 19080 | 334 |
| | 12 | 953 | 19569 | 489 |
| | 12 | 965 | 19983 | 414 |
| | 8 | 973 | 20379 | 396 |
| | 17 | 990 | 20838 | 459 |
| May 24 | 5 | 995 | 21236 | 398 |
| | 1 | 996 | 21440 | 204 |

| | | | | |
|---|---|---|---|---|
| | 17 | 1013 | 21867 | 427 |
| | 12 | 1025 | 22303 | 436 |
| | 5 | 1030 | 22600 | 297 |
| May 29 | 13 | 1043 | 22964 | 364 |
| | 8 | 1051 | 23376 | 412 |
| | 13 | 1064 | 23686 | 310 |

*Source*: Own elaboration.

The horizontal transmission percentage - how the virus circulates in the population and how quickly infected people can be isolated - was also an important factor. Under strict sanitary rules, hairdresser and beauty salons were allowed to reopen, while catering services were restored (restaurants, cafés, bars and tea gardens) under a restriction of 1 person per 4 $m^2$ (since May, 18$^{th}$). The passenger limit in public transport was changed (50% of seats could be occupied) or 30% of all seats and standing places. Outdoor sports facilities were reopened and open-air sport activity was allowed at stadiums, sports fields, ski jumping fields, tracks and soccer fields (14 persons and 4 coaches at a given open-air sports facility). The occupancy restriction for churches was reduced to 1 person per 10 $m^2$. Post-secondary schools as well as music and art colleges were allowed to hold classes. Starting May 25, 2020, childcare for children in I-III grades was restored. Other restrictions were, however, upkept[10]:

- social distancing (2 m apart) in public space;
- the requirement to wear masks (to cover the nose and mouth) in public space;
- the order to follow sanitary rules in places of gatherings.

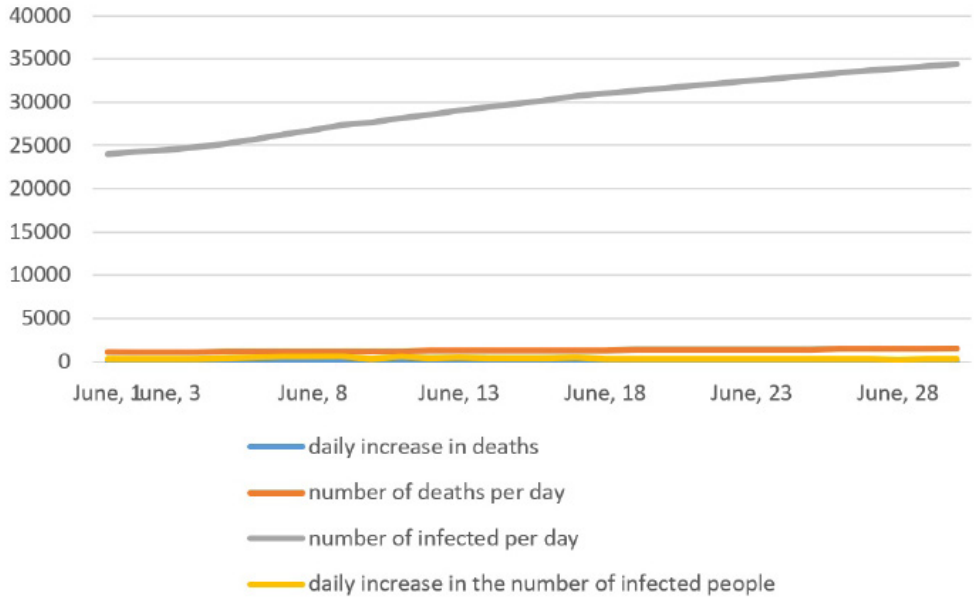
Due to the decreasing incidence of COVID-19, and thus a decline in the number of deaths, the government decided to lift the obliga-

[10] Social distancing means keeping a safe distance from passers-by in open-air and closed spaces, in order to reduce the risk of contracting COVID-19. During a pandemic, a distance of two metres applies, excluding: parents with children requiring care (under 13 years of age), disabled persons, housemates/flatmates, persons with covered their mouth and nose.

tion to cover mouth and nose in open space, with social distancing (2 m apart), starting May 30, 2020. The obligation to cover the mouth and nose continued to apply in closed space, including buses and trams, shops, cinemas and theatres, massage and tattoo salons, churches and public service offices.

Some of the restrictions were lifted on the 30th of May 2020, the rest on the 6th of June the same year. The June infection level is shown in Figure 38 and Table 7. At the beginning of June, weddings and family celebrations for up to 150 persons were allowed (wedding participants did not have to wear masks, but sanitary guidelines were still in force). Gyms, swimming pools, massage and tattoo salons, beauty salons, playgrounds, fitness clubs and amusement parks as well as cinemas, theatres, operas etc., were reopened (sanitary guidelines still applied). Starting June 19, 2020, stadiums could open 25% of their seat capacity, under precautionary measures.

*Figure 38.* **COVID-19 incidence and morbidity statistics in June 2020**




*Source*: own elaboration.

To partly unfreeze the economy, the government announced the lifting of border traffic restrictions. Starting June 13, the borders within the European Union reopened – the Poles returning from EU countries did not had to undergo a 14-day quarantine. Travelers were free to enter and leave Poland. This also applied to transit. Foreigners from the EU and the EFTA (European Free Trade Agreement) Member States, who crossed the borders of Poland, did not have to undergo a 14-day quarantine either. The EU's external borders remained closed. Starting June 16, 2020, international flights were resumed.

*Table 7.* **COVID-19 incidence and morbidity statistics in June 2020**

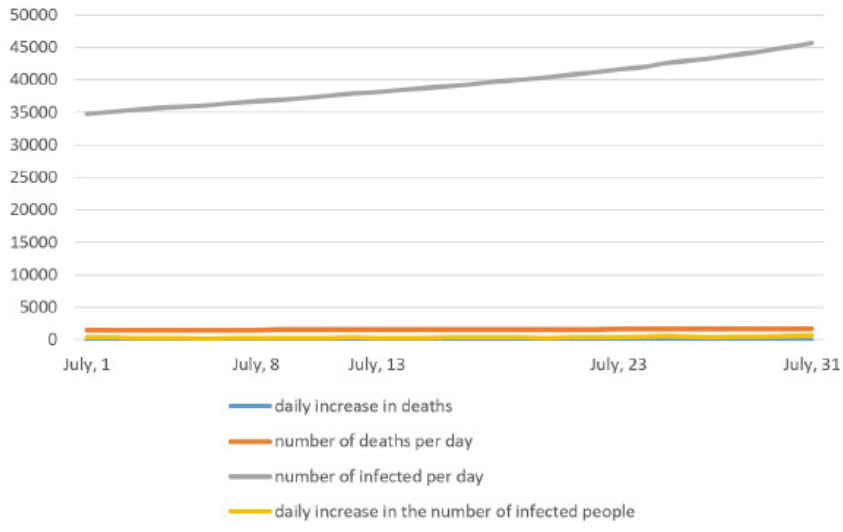
| | daily increase in deaths | number of deaths per day | number of infected per day | daily increase in the number of infected people |
|---|---|---|---|---|
| June 1 | 1 | 1065 | 23987 | 301 |
| | 16 | 1081 | 24271 | 284 |
| June 3 | 21 | 1102 | 24545 | 274 |
| | 15 | 1117 | 24826 | 281 |
| | 10 | 1127 | 25177 | 351 |
| | 16 | 1143 | 25669 | 492 |
| | 12 | 1155 | 26249 | 580 |
| June 8 | 6 | 1161 | 26780 | 531 |
| | 11 | 1172 | 27365 | 585 |
| | 19 | 1191 | 27668 | 303 |
| | 24 | 1215 | 28201 | 533 |
| | 7 | 1222 | 28577 | 376 |
| June 13 | 15 | 1237 | 29017 | 440 |
| | 10 | 1247 | 29392 | 375 |
| | 9 | 1256 | 29788 | 396 |
| | 16 | 1272 | 30195 | 407 |
| | 14 | 1286 | 30701 | 506 |
| June 18 | 30 | 1316 | 31015 | 314 |

| | | | | |
|---|---|---|---|---|
| | 18 | 1334 | 31316 | 301 |
| | 12 | 1346 | 31620 | 304 |
| | 10 | 1356 | 31931 | 311 |
| | 3 | 1359 | 32227 | 296 |
| June 23 | 16 | 1375 | 32527 | 300 |
| | 21 | 1396 | 32821 | 294 |
| | 16 | 1412 | 33119 | 298 |
| | 17 | 1429 | 33395 | 276 |
| | 6 | 1435 | 33714 | 319 |
| June 28 | 3 | 1438 | 33907 | 193 |
| | 6 | 1444 | 34154 | 247 |
| | 19 | 1463 | 34393 | 239 |

*Source*: own elaboration.

When analyzing Figure 39 and Table 8, it can be seen that despite the hygiene education and the introduction of various types of restrictions, the COVID-19 incidence curve continued to increase in Poland, nevertheless, the number of deaths remained stable.

*Figure 39.* **COVID-19 incidence and morbidity statistics in July 2020**




Source: own elaboration.

*Table 8.* **COVID-19 incidence and morbidity statistics in July 2020**

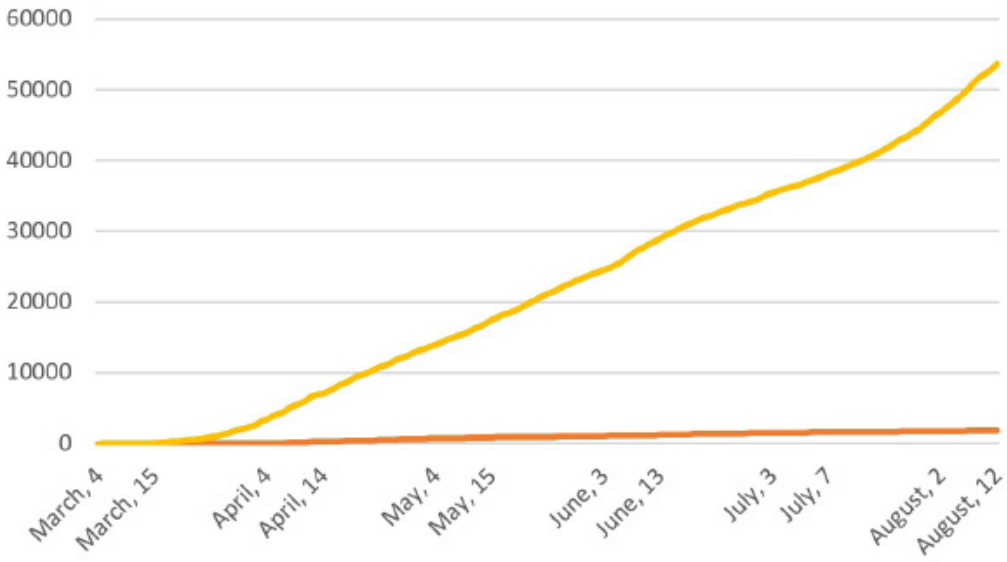
| | daily increase in deaths | number of deaths per day | number of infected per day | daily increase in the number of infected people |
|---|---|---|---|---|
| July 1 | 14 | 1477 | 34775 | 382 |
| | 15 | 1492 | 35146 | 371 |
| | 15 | 1507 | 35405 | 259 |
| | 5 | 1512 | 35719 | 314 |
| | 5 | 1517 | 35950 | 231 |
| | 4 | 1521 | 36155 | 205 |
| | 7 | 1528 | 36412 | 257 |
| July 8 | 14 | 1542 | 36689 | 277 |
| | 9 | 1551 | 36951 | 262 |
| | 11 | 1562 | 37216 | 265 |
| | 6 | 1568 | 37521 | 305 |
| | 3 | 1571 | 37891 | 370 |
| July 13 | 5 | 1576 | 38190 | 299 |
| | 12 | 1588 | 38457 | 267 |
| | 6 | 1594 | 38721 | 264 |
| | 11 | 1605 | 39054 | 333 |
| | 7 | 1612 | 39407 | 353 |
| | 6 | 1618 | 39746 | 339 |
| | 6 | 1624 | 40104 | 358 |
| | 3 | 1627 | 40383 | 279 |
| | 9 | 1636 | 40782 | 399 |
| | 6 | 1642 | 41162 | 380 |
| July 23 | 9 | 1651 | 41580 | 418 |
| | 4 | 1655 | 42038 | 458 |
| | 9 | 1664 | 42622 | 584 |
| | 7 | 1671 | 43065 | 443 |
| | 5 | 1676 | 43402 | 337 |
| | 6 | 1682 | 43904 | 502 |
| | 12 | 1694 | 44416 | 512 |

| | | | | |
|---|---|---|---|---|
| | 15 | 1709 | 45031 | 615 |
| July 31 | 7 | 1716 | 45688 | 657 |

*Source*: own elaboration.

It is also worthwhile analyzing Figure 40, which shows the course of incidence throughout the entire duration of the pandemic, i.e. from the 4th of March 2020 to the 12th of August 2020.

*Figure 40.* **COVID-19 incidence and mortality curves for the period from March to August 2020**

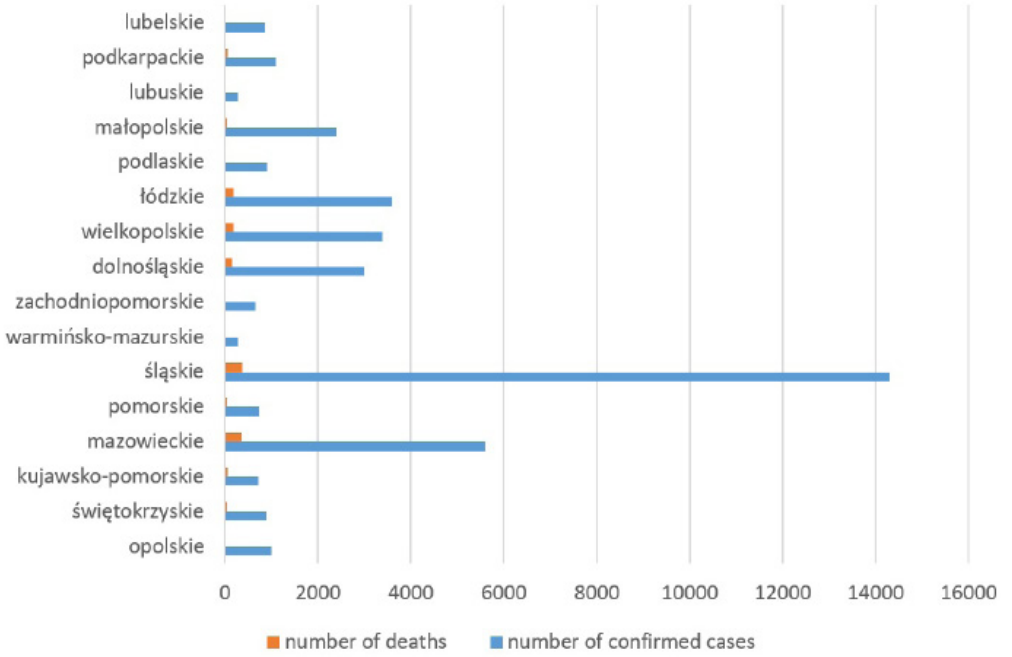



*Source*: own elaboration.

COVID-19 incidence and mortality distribution by voivodeship[11] is presented in Figure 41 and Table 9.

[11] Voivodship normally refers to one of the provinces *(województwa)* of Poland. As of 2017, Poland has 16 voivodeships.

*Figure 41.* **COVID-19 incidence and morbidity statistics by voivodeship, as of the 1st of August 2020**




*Source*: Available at: https://www.gov.pl/web/koronawirus/wykaz-zarazen-koronawirusem-sars-cov-2 (1.08.2020).

*Table 9.* **COVID-19 incidence and morbidity statistics by voivodeship as of 1 August 2020**

| voivodeship | number of confirmed COVID-19 cases | number of deaths |
|---|---|---|
| Opole (opolskie) | 1000 | 54 |
| Świętokrzyskie | 879 | 45 |
| Kuyavian-Pomeranian (kujawsko-pomorskie) | 717 | 49 |
| Masovian (mazowieckie) | 5600 | 363 |

| | | |
|---|---|---|
| Pomeranian (pomorskie) | 741 | 39 |
| Silesian (śląskie) | 14300 | 370 |
| Warmian-Masurian (warmińsko-mazurskie) | 292 | 1 |
| West Pomeranian (zachodnio-pomorskie) | 653 | 23 |
| Lower Silesian (dolnośląskie) | 3000 | 152 |
| Greater Poland (wielkopolskie) | 3400 | 190 |
| Łódź (łódzkie) | 3600 | 192 |
| Podlaskie | 911 | 16 |
| Lesser Poland (małopolskie) | 2400 | 47 |
| Lubusz (lubiskie) | 284 | 1 |
| Subcarpathian (podkarpackie) | 1100 | 56 |
| Lublin (lubelskie) | 872 | 20 |

*Source*: Available at: https://www.gov.pl/web/koronawirus/wykaz-zarazen-koronawirusem-sars-cov-2 (accessed 1 August 2020).

## THE CASE OF SILESIA

As of September 2020, the Silesian Voivodeship had for several months been the largest center of coronavirus outbreak in Poland (Figure 41 and Table 9). The Silesian Voivodeship is highlighted on the map of Poland presented on Picture 14.

A question arises about the reasons for this state of affairs, which, among others, include:

- population density (366.3 people/km$^2$),
- industry concentration (the Silesian Voivodeship is the most industrialized area in Poland and one of the most developed voivodeships, with the highest in Poland percentage of persons working in industry; the largest production plants and mines are located here).

Its significant concentration of population translates into the voivodeship's difficult situation, with the highest in Poland num-

ber of coronavirus infections (153 cases as of August 20, 2020, at 900 cases Poland-wide and the average number of COVID-19 cases per voivodeship at the level of 56,25.

*Picture 14.* **The Silesian Voivodeship on the map of Poland**


*Source*: Available at: https://sites.google.com/site/wojewodztwawpolsce/wojewodztwo-slaskie (accessed 18 August 2020).

In addition to the region's counties with record numbers of cases, places where not a single case of coronavirus was detected were noted as well. Due to the significant concentration of population (a complex of connected large and medium-sized towns) and the population flow resulting from commuting - the region is one of the areas with the greatest in Poland socio-economic po-

tential. These conditions translate into its situation associated with the epidemiological threat of COVID-19.

The number of healthcare facilities, especially hospitals, and their distribution within the region (79 hospitals in the central part of the region alone) as well as the number of nursing homes caring for the elderly and people with health problems are important factors as well. Another important factor is the behavior of the inhabitants themselves as well as the network of their families and their social and professional connections, which may have influenced the course of the epidemic.

The distribution of coronavirus infections within the Silesian Voivodeship varies. It is largely associated with cases of infections in nursing homes and coal mines; it is also a derivative of the increased number of coronavirus tests that had been carried out - nearly 65 000 tests; entire crews from several coal mines underwent screening tests. At the county level, the highest number of cases was recorded in Bytom, where 657 cases were reported. This was caused by the coronavirus contraction among both the miners and the residents of home care centers (Polish: Dom Pomocy Społecznej, DPS). In the DPS 'Kombatant', over 60 people got the disease, while in the Voivodeship Hospital No. 4 in Bytom - over 30.

A lot of cases were reported in the Lubliniec County (369 persons) and in the city of Rybnik (343 persons). More than 200 cases were reported in Katowice (the voivodeship capital) as well as in the counties of Żywiec, Tarnogóra, Wodzisław and Cieszyn. On the scale of the Silesian Voivodship counties, the lowest number of cases was recorded in Jaworzno (11 cases), Siemianowice Śląskie (28 persons) and the Kłobuck County (31 people).

Consecutively, taking into account the number of cases per 100 000 inhabitants, three areas where the number of cases exceeded 150 cases per 100 000 inhabitants can be distinguished:

- the Lubliniec and Tarnogóra counties, Bytom and Piekary Śląskie,

- the city of Rybnik, the Rybnik County, Żory and the Wodzisław County,
- the Żywiec County.
- There are also areas with the lowest incidence of COVID-19:
- the Częstochowa and Kłobuck counties as well as the city of Częstochowa;
- Dąbrowa Górnicza, Sosnowiec, Jaworzno, Tychy, the Bieruńsko-Lędziński and Mikołów counties;
- the city of Bielsko-Biała and the Bielsko-Biała County.

In terms of cases per 100 000 inhabitants, the worst result was recorded in Czernichów (in the Żywiec County), where the incidence rate reached a record level of 1513 cases per 100 000 inhabitants. This resulted from the large outbreak of infections in the local nursing home.

Second place belonged to Woźniki in the Lubliniec County (915 infections per 100 thousand inhabitants) and Świerklany in the Rybnik County (793 cases per 100 thousand inhabitants). Comparable levels - over 500 cases per 100 000 inhabitants - were recorded in Koszęcin and Lubliniec. The situation in Czernichów, Woźniki, Koszęcin and Lubliniec was associated with the infections in home care centers and nursing homes, whereas in Świerklany, it resulted from the coronavirus infections detected among the employees of coal mines.

In the Silesian Voivodeship, as of the 18th of May 2020, there were 22 municipalities with no active cases of coronavirus, nine of which did not record any cases, while 13 of them did record infections, but these persons had already recovered. Unfortunately, three COVID-19 death cases were also reported in these municipalities. The municipalities without confirmed cases of coronavirus were in the northern part of the voivodeship: in the Częstochowa and the Kłobuck counties.

Such state of things could be changed by increased and more proportional distribution of testing in different cities. Identification of the outbreaks of numerous infections is intended to reinforce

the process of monitoring the epidemic; in no case can it be regarded as stigmatization of individual municipalities and their inhabitants. This should be stressed, because inexplicable reactions could be observed not only in Poland, but in international relations as well.

Starting August 2020, the Polish Government introduced the concept of the so-called yellow and red zones in association with the number of infected persons in given counties. In red zones, among other things, congresses and fairs could not be organized, while sanatoriums, amusement parks and theme parks were not allowed to operate. A limit of one person per 10 $m^2$ in applied to gyms. Cinemas could fill 25% of their audience capacity. In churches and other places of worship, 50% of the building occupancy rate was allowed, while outside the building the limit was 150 persons. The number of participants in family celebrations and weddings was limited to 50 persons, excluding service staff. It was necessary to cover the nose and mouth in public.

In yellow zones, a limit of one person per 4 $m^2$ applied to such events as: fairs, exhibitions, congresses or conferences. Gyms were limited to one person per 7 $m^2$. Cinemas were allowed to fill 25% of their audience capacity. The number of participants in family events could not exceed 100 persons, excluding service staff.

CHAPTER 2

# The Polish health information system

Information management is also important for achievement of the health education and disease prevention objectives, including prevention of social panic.

Assessment of the population's health status should take into account contemporary concepts of health, along with its numerous determinants (Lalonde Models, the Mandala of Health, etc.). In epidemiology practice, assessment of the health status usually boils down to the determination of the following states: 'disease exists' or 'no disease'. These states require unambiguous definitions, developed based on unambiguous criteria, e.g. selected subjective and objective symptoms, and selected laboratory test results. It is essential to make the definitions and the criteria used in epidemiology clear and unambiguous, easy to apply, taking into account standardized measurement that can be used under different circumstances by various people.

## HEALTH INDICATORS

The science of epidemiology usually is limited to a clear, as much unambiguous as possible, differentiation between the state of good health and the state of illness, as well as to the defining of the norm and the extent of illness variability. A community's (population's) state of health is not just a sum of individual states, whereas precise measurement of individual 'health-disease' phases is not possible.

Another methodical problem associated with analysis of a population's health is the lack of sufficiently proper information regarding the health conditions that are not very clear, but often dramatically expressed: death, hospitalization, i.e. they require prior in-depth diagnostics. In epidemiology - a scientific field which enables the monitoring of population's state of health, negative health meters, complemented with the results of well-planned epidemiological studies, are of the greatest significance, apart from the study of the quality of life, life satisfaction, the average life expectancy and the average life expectancy in good health. The existing information systems enable analysis of the health situation only based on the so-called negative health meters.

The most important of these are: prevalence, incidence, hospitalization (intensity, structure), mortality.

$$\text{Prevalence rate} = \frac{\text{number of sick persons}}{\text{number of persons subject to infection}} \text{ x } 10n$$

The level of prevalence depends on many factors, which include:

- the severity of the disease (more deaths among patients result in a lower rate);
- the duration of the disease (the shorter the duration, the lower the incidence rate);
- the number of new cases of the disease (the greater the number, the higher the prevalence);

- migration in the population (the rate is greater when the sick immigrate and/or the healthy emigrate).

The incidence rate is the number of new cases in a given period of time, in relation to the population at risk. Only new infections (new cases) are included in the numerator. The denominator must

$$\text{Maturity rate} = \frac{\text{number of persons who fall ill at a given time}}{\text{summary of periods when each person in the population is at risk}} \; x\; 10n$$

indicate the period of time the incidence is related to (a week, a month, a year, etc.).

In practice, accurate assessment of the period from the moment of disease contraction often is not possible. Value approximation is then applied, by multiplying the size of the population examined by the duration of the observation period.

The cumulative incidence rate is a simple measure of incidence.

$$\text{Cumulative incidence rate} = \frac{\text{number of persons who fall me ill at a given time}}{\text{population at risk at the beginning of the period analyzed}} \; x\; 10n$$

The denominator is the number of the population at risk at only one point in time, at the beginning of the period analyzed.

Cumulative incidence determines the likelihood or the risk of infection contagion by an individual from the population at risk, at the time under consideration. The value of this ratio provides a useful measure for comparison of health risks in different populations.

$$\text{Mortality} = \frac{\text{number of deaths caused by a given disease}}{\text{number of cases in the same time period}} \; x\; 10n$$

The mortality rate is a measure of disease severity and treatment ineffectiveness.

Mortality rate is the percentage of the persons who have died from a given disease, in relation to the number of the persons who contracted that disease. It is therefore not a measure of severity, but a measure of treatment failure (or a measure of risk). The fact that most of the measures which characterize a society's health situation are constructed based on the so-called patients' spontaneous reporting to healthcare institutions is of most significance. Even ideal information systems are only able to measure the so-called expressed health needs. It is well-known, however, that most health needs remain hidden and are not revealed spontaneously. The dependence between the revealed and the hidden health needs can be illustrated by the iceberg syndrome. Most issues remain hidden.

There are also situations when:

- loss of health (life) may occur, if preventive measures are not taken;
- negative health effects may occur, if preventive action is not taken;
- a change in one or more elements, or a change in their arrangement, is conducive to the development of the disease.

Such understanding of health needs complements the concept of 'the demand for health care'. This demand is a reflection of the health needs and entails an expectation that these needs will be met to the extent subjectively-deemed possible. The demand for health care is determined by many socioeconomic and cultural factors, the level of knowledge about health, availability of services, etc. When analyzing the relationship between the health needs and the demand for health care, many problems can be encountered, in terms of ethics, economics and health care organization, which result from the problems in assessing the purposefulness and the possibility of active diagnostics as well as the problems with raising awareness of the hidden health needs.

## THE STATUS OF THE POLISH INFORMATION SYSTEM IN HEALTHCARE

The Polish healthcare sector's information system has been permanently established by law. It collects a wide variety of data, but many areas are still not sufficiently covered by the system. In practice, the system is not very flexible when it comes to accessing information in a non-standard layout. At the same time, the idea of public health is not popular enough among the persons making strategic decisions and, as a result, the information generated, unfortunately, is underused. Another serious shortcoming is the lack of feedback that could be used by data producers at the primary and intermediate levels. This reduces interest in improving the quality of the data generated by these links of the system.

As of September 2020, the healthcare information system in Poland consists of four parts (Goryński and Wojtyniak, 2010):

1. The first part is supervised by the Ministry of Health, the Chief Sanitary Inspectorate (Polish: Generalny Inspektorat Sanitarny) and by some scientific institutions at the Ministry of Health. It includes information systems that deal with the elements of the population's health status, the healthcare institutions' activity, the sanitary status and the environmental health threats, as well as the infrastructure and employment.
2. The second part covers the systems supervised by the Central Statistical Office (Polish: Główny Urząd Statystyczny, GUS) which deal with mortality, births and certain elements of healthcare institutions' activity. This group also includes the information system dealing with inability to work, supervised by the Social Security Office (Polish: Zakład Ubezpieczeń Społecznych, ZUS).
3. The third part consists of the information systems set up as part of the health insurance fund's activity, taken over by the National Health Fund and covering the reporting on the services provided as well as the register of the insured.

4. The fourth part deals with periodic or ad hoc studies, not covered by legal regulations, which usually concern epidemiological issues and are carried out by scientific associations or research institutes.

All healthcare institutions, as well as institutions outside the public sector, providing healthcare services to the so-called uniformed services (the Army and the Police) are obliged to implement statistical information systems.

The general scope of the statistical information collected for the National Health Fund (formerly the Health Insurance Fund) is specified in the Act on Healthcare Services Financed with Public Funds and in the relevant regulations issued by the Ministry of Health.

The Healthcare Information System in Poland (Figure 42) aims to monitor the population's health. It is based on:

1. individual records (data collected on a continuous basis),
2. the outpatient-care data collected annually,
3. the data on environmental health hazards and the sanitary conditions (the healthcare sector, the environmental sector),
4. the data on healthcare workers: Register of doctors and dentists (the Chamber of Physicians and Dentists[12]),
5. the system collecting data on healthcare infrastructure,
6. the systems collecting data on the activity of healthcare facilities,
7. the National Health Fund information systems.

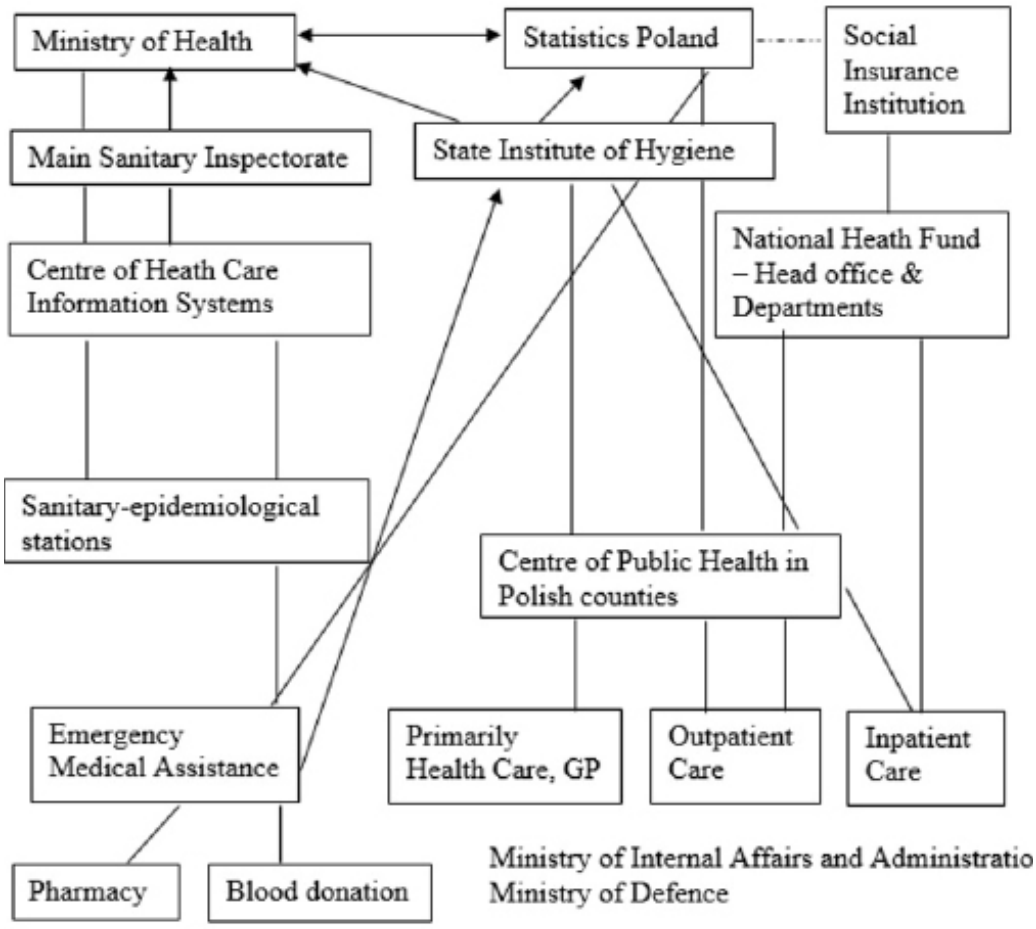
Among the systems based on individual records, the following can be listed (Bzdęga and Gębska-Kuczerowska, 2001):

- Registers of selected diseases (systems within the healthcare sector);
- Register of infectious diseases (the healthcare sector);

[12] The Polish Chamber of Physicians and Dentists (Naczelna Izba Lekarska) is a professional, self-governing organisation of physicians and dental practitioners. Its aims, objectives and activities are defined by the Polish national law - the Act of 17 May 1989 on Chambers of Physicians.

- Register of deaths and births (the Central Statistical Office systems);
- Hospital discharge database (the healthcare sector);
- Register of persons temporarily or permanently unable to work (Social Security Office system).

*Figure 42.* **The flow of health-related information in healthcare information systems**




*Source*: own elaboration based on Bzdęga and Gębska-Kuczerowska, 2010.

The systems based on outpatient care data collected annually include (Bzdęga and Gębska-Kuczerowska, 2010):

- A system for collecting aggregated data on patients treated in general and specialist ambulatory healthcare units, based on selected diagnostic groups (the healthcare sector);
- A data collection system for compulsory general vaccination (the healthcare sector);
- A system of annual data collection on the medical workers in the healthcare sector and in other sectors (the healthcare sector and the Central Statistical Office).

Primary institutions participating in the public health information system:

- Centre of Healthcare Information Systems (Centrum Systemów Informacyjnych w Ochronie Zdrowia)
- National Institute of Public Health (Narodowy Instytut Zdrowia Publicznego)
- Centre of Oncology - Maria Skłodowska-Curie Institute (Centrum Onkologii – Instytut im. Marii Skłodowskiej-Curie)
- Central Statistical Office (Główny Urząd Statystyczny)
- National Health Fund (Narodowy Fundusz Zdrowia)
- Chief Sanitary Inspectorate (Główny Inspektorat Sanitarny)
- Voivodeship sanitary and epidemiological stations
- Voivodeship public healthcare centers
- Institute of Psychiatry and Neurology (Instytut Psychiatrii i Neurologii)
- Institute for Tuberculosis and Lung Diseases (Institute of Tuberculosis and Lung Diseases)
- Prof. J. Nofer Institute of Occupational Medicine in Łódź (Instytut Medycyny Pracy w Łodzi im. Prof. J. Nofera)
- Institute of Venereology, Medical University of Warsaw

The National Institute of Public Health – the National Institute of Hygiene (NIZP-PZH) acts as the national central laboratory

and, in accordance with ECDC guidelines (Laboratory support for Covid-19 in the EU/EEA, 2020), is the body veryfying the results of laboratory tests for COVID-19 in Poland.

The exchange of information on the health situation in Poland with international organizations takes place on an ongoing basis, especially when it comes to Eurostat, the OECD and the WHO. The Central Statistical Office in Poland is responsible for providing information to Eurostat. The OECD receives data through the Ministry of Health, while the WHO - through the Ministry of Health institute supervising individual subsystems that are based on individual data, e.g. information on infectious diseases in Poland is provided by the National Institute of Public Health. Additionally, the National Institute of Public Health provides the WHO with information, as a 'focal point' for the indicators used to monitor the implementation of the Health 21 strategy.

# CHAPTER 3

# Poles in the face of the pandemic

## ATTITUDES, THE ECONOMY AND CULTURE

The coronavirus pandemic exposed the weakness of the system and the problems that had been unrecognized. It has also revealed certain social attitudes. On the one hand, the society begun to praise the medical staff and applaud them on balconies, on the other, hate emerged. In mid-April 2020, the Polish Ombudsman Adam Bodnar, in a letter to Łukasz Jankowski - the President of the District Medical Council (Polish: Okręgowa Rada Lekarska) in Warsaw, expressed his concern about the threat to the safety of doctors and health care workers, stating that he was receiving information about attacks and hate speech directed at the healthcare sector staff. Bodnar pointed to three areas of hatred towards doctors: unreliable media information published without prior verification, hateful speech directed towards those who decide to report in social media the irregularities in the system of combating the epidemic, and attacks on healthcare workers by individual people from their surroundings (neighbors, public transport passengers, commercial service work-

ers). In short, healthcare professionals were ostracized at their place of residence, because people fear they will contract the coronavirus.

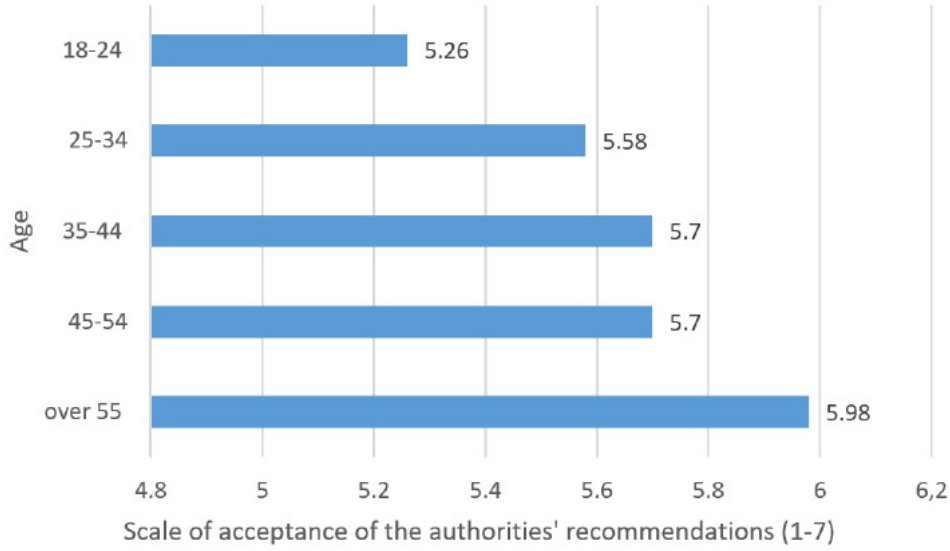
The Poles accepted the announcement of a state of epidemic with composure. Before the lockdown restrictions were introduced, they had not felt fear, but carefully followed the information in the media, which was reported in a selective and non-systematic way. The need for information inevitably increased, when the first cases of SARS-CoV-2 infection were reported in Europe. Regardless of the official announcements presented by the government or the services responsible for epidemiological safety (daily press briefings by the Ministry of Health spokesperson from the moment the first case was detected), spontaneous information kept emerging in social media. The discrepancy between expert analyses of the risk and the public's perception of it necessitated constant update of the information relayed (Stankiewicz, 2016). After the first case in Poland had been reported, the subject of coronavirus became the main conversation topic at home, at work and on the streets.

The Stefan Batory Foundation, along with its ForumIdea program and the SWPS University, conducted a study – "Society in the face of an epidemic. A research report" (Maj and Skarżyńska, 2020). It turned out that although the declared level of acceptance for top-down recommendations is high (over 80% of the entire sample), the respondents' age, gender, education and the place of residence varied significantly.

Older respondents, more commonly than younger ones, declared compliance with the recommendations and restrictions (the lowest level of restriction acceptance was observed in the group of the youngest respondents, the highest - among persons over 55 years of age), as illustrated in Figure 43.

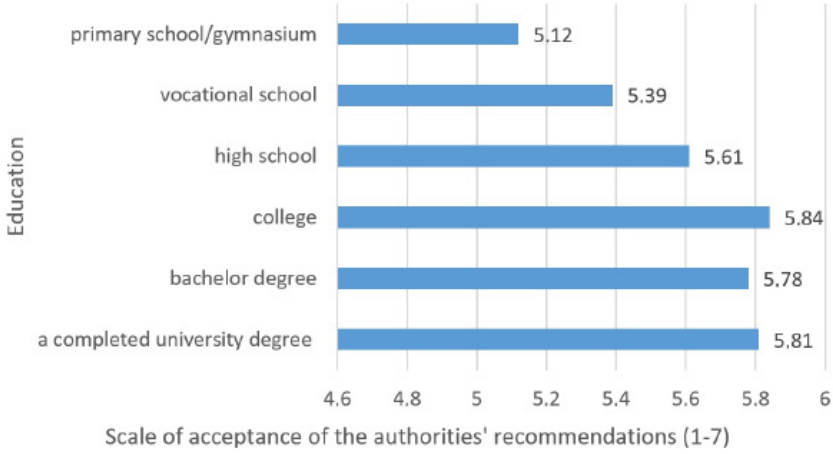
The research results show that persons with higher education followed the authorities' recommendations more frequently (Figure 44).

*Figure 43.* **The scale of acceptance for the recommendations issued by authorities**




*Source*: (Maj and Skarżyńska, 2016).

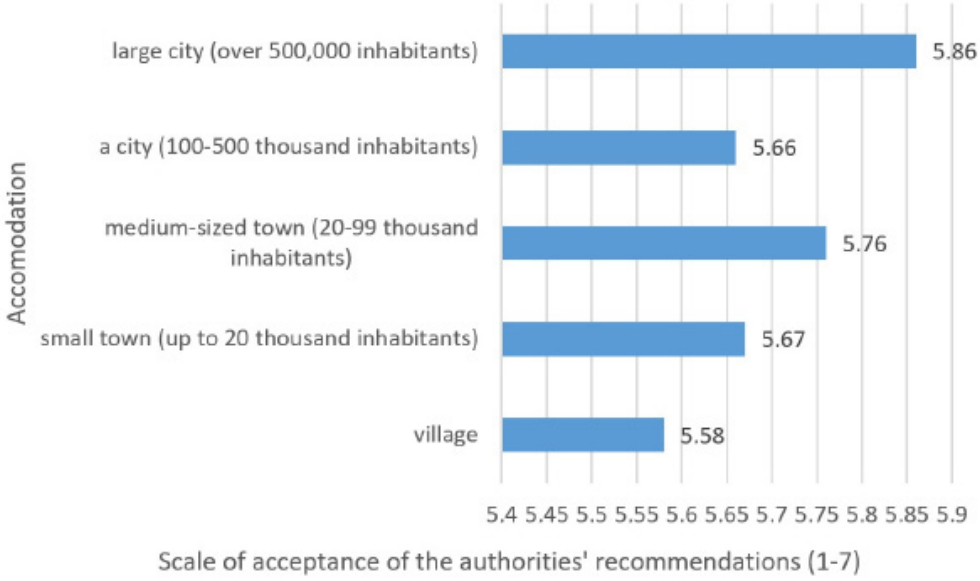
*Figure 44.* **Education level and acceptance for the authorities' recommendations**




*Source*: (Maj and Skarżyńska, 2016).

The results of the research indicated that residents of large cities followed the recommendations and restrictions more frequently than persons living in rural areas, as illustrated in Figure 45.

*Figure 45.* **Observance of the recommendations and restrictions, in place-of-residence distribution**




*Source*: (Maj and Skarżyńska, 2016).

Analyzing Figure 12, the following reasons for such results can be identified. First of all, persons whose the so-called intellectual, social and material assets are higher, usually handle difficult, stressful situations better; this has been addressed by the Hobfoll's Conservation of Resources theory (Hobfoll, 2001), confirmed by numerous studies on people's reactions to floods, earthquakes and large fires. Secondly, such persons more commonly perform intellectual and creative work, which they can do remotely (on-line), and often had worked in this manner before the epidemic. Thirdly, they generally have greater access to various sources of expert information, hence their awareness of the fact that social isolation helps

control epidemics. Significant differences can be observed in terms of gender - women more often than men declared compliance with the recommendations (an almost 10% difference), which may have resulted from their feminine self-discipline and care for the loved ones.

As the world was struggling with the coronavirus pandemic, European governments recommended home quarantine. The situation was similar in Poland. Concerts and mass events were cancelled, while cinemas, theatres, museums, schools and some shops, with the exception of groceries, remained closed. This exceptional situation of widespread quarantine has changed the face of trade radically. Paradoxically, in the #stayhome era, the sale of certain products increased.

At the turn of February and March, the agencies dealing with trade monitoring and analysis confirmed the increase in sales for the entire shopping basket - particularly for such categories as cleaning products and dry food products, but the biggest increase in purchases was recorded in the 11$^{th}$ week of the year (March 09-15), when the government announced its decision to close schools and the Polish borders, and Poles began mass preparation for life in quarantine.

After the government had announced gradual restrictions on the opening of stores, Dantean scenes could be observed in Polish supermarkets. It was a natural human reaction to uncertainty as well as expression of the desire to control the situation. Apparently, toilet paper and cleaning products became objects of almost symbolic importance in many European countries. When people cannot prepare by accumulating resources that really matter in such a situation (e.g. effective medications, disinfectants or even protective masks), they feel helpless.

Under such circumstances, any preparation, even the purchase of toilet paper, restores people's sense of control over the situation. People are terrified of the SARS-CoV-2 coronavirus, because it is

a new virus and little is known about it. When people receive so much contradictory information regarding the risks (e.g. the requirement and legitimacy of wearing masks) and about how seriously they should take the preparations, it is natural that their reactions are extreme. On one hand, they follow the sanitary institutions' recommendations, but sometimes they also overreact by accumulating selected basic necessities. The data for the last week of February, before the announcement of quarantine, showed a three-fold increase in the value of buy-ahead purchases. In selected cases, the level of sales corresponded to that of Christmas time and, in some cases, significantly exceeded it.

Images of empty store shelves and shopping carts filled with products flooded the news and social media. For people, it was a signal that they should go shopping while they still could. Social media make the spread of such images of distorted reality particularly easy. As a result, what was a fictious or a potential shortage, became an actual one.

Compliance with the sanitary institutions' recommendations contributed to an increase in the demand for cleaning products, antibacterial gels in particular. Nielsen's data showed that in the period from February 24 to March 01, i.e. two days before the first case of coronavirus infection was confirmed in Poland, nearly 480 thousand antibacterial hand gels had been sold. Compared to the same week a year earlier, the sales of cleaning products increased: soap by 66%, toilet paper by 24%. The information collected by the Nielsen research agency, regarding the turn of February and March, i.e. the 9$^{th}$ week of the year, showed that the sales of rice, flour and pasta increased by 95%, by 84% and by 65% respectively. During this time, three-digit increases were noted in the purchase of alcohol, which is treated as a component of disinfectants (Polacy kupują na zapas, 2020).

Apart from the cleaning products, Poles decided to prepare for possible isolation. Before they locked themselves in their homes,

they went shopping for food. The sale of canned food, ready-made dishes and the so-called dry food products, i.e. pasta, groats, cereal and rice, increased.

The week when the school closure was announced was crucial. In addition to the increased purchases of products with long shelf life, e.g. flour, pasta, groats and water, the sales of milk, eggs, meat and baby food went up as well. Importantly, both the number and the average value of transactions increased for most of these categories, as evidenced by the buy-ahead purchases noted.

The data for the following week in March (March 16-22) indicated that Poles were consuming the products purchased a week earlier and respected the quarantine recommendations - in terms of purchases, the volume and the value of sales dropped significantly, compared to the previous peak week. In comparison with the same period a year before, however, despite the lower number of transactions (24% less) in small-format stores, the average number and the receipt value of the products purchased increased significantly, which resulted in a 4.5% increase in the sales value. The last week of March 2020 was a continuation of the trend from the previous year – Poles went shopping less frequently, but their purchases were larger, which easily can be explained by the sanitary services' recommendation to leave home as rarely as possible and when necessary only. Declines were recorded in typical impulse shopping categories: chewing gum, candy bars, energy drinks, liquid yoghurt, but also products that are not needed during a lockdown period. Interestingly, the sale of plants and gardening equipment increased, due to the fact that during lockdown, people desired a substitute for a garden (all the more so, as parks, forests and other green areas were closed for the public).

The announcement of quarantine, the resulting minimization of instances when people leave home as well as the fear of coronavirus infection resulted in increased online grocery shopping, which

not only ensured safety, but also access home delivery of necessary products.

The time of lockdown also resulted in a number of initiatives, which, for various reasons, had not been available to many Poles. Despite the fact that museums, art galleries, theatres, operas, cinemas etc., were closed, paradoxically, this difficult time was used for art-related and cultural activity – also available online. It is important to note that the art and event industry, along with tourism, were one of the first to suffer the crisis. Artists, despite the difficult situation they found themselves in, concerted and performed online, free of charge. A Facebook group was formed – "Kultura w kwarantannie" (Culture in Quarantine), where people posted information about such events.

The *#KulturaWCzasachPandemii* (Culture in the Time of Pandemic) and *#kulturaonline* (cultureonline) hashtags were helpful here. Museum websites from all over the world, in cooperation with Google, offered virtual walks through their galleries – the Google Arts & Culture platform offers such visits at various museum in every corner of the world, without having to leave home. There are more than 500 places to choose from, e.g. the Louvre in Paris and the and the Musee d'Orsay with its rich impressionist collection, the MOMA in New York City, the Frida Kahlo's Museum in Mexico, the Munch Museum in Norway, the Rijksmuseum and the Van Gogh Museum in the Netherlands, the Uffizi Gallery in Italy and the Tate Britain in England. Polish museums also offer a great repertoire of exhibitions via their own websites or the kulturadostepna.pl portal. For instance, the Museum of Contemporary Art in Cracow - MOCAK, the Museum of the Warsaw Uprising, the Royal Castle in Warsaw, the Malbork Castle or the Salt Mine in Wieliczka as well as various historic churches can be visited virtually. It is also possible to take a walk along the streets of Cracow. The ninateka.pl portal offers free access to plays, operas, films, animations, documents

about architecture and art, or audio books. Concerts are available (often live) on the YouTube platform.

During the pandemic, another Polish feature revealed itself - the desire to help those in need. People sewed covers, suits, masks, produced disinfectants, conducted online yoga classes, encouraged home activities, showed around the forest and museums – all via the Internet. They borrowed books, shopped, got medications, provided warm meals for people on quarantine, the seniors who had problems with shopping themselves and doctors on duty. They made sure that people who could not go shopping themselves had enough water supply and walked dogs out for those who could not do it themselves. Assistance groups (e.g. "the visible hand") started to grow in strength during the pandemic.

## SOCIAL MEDIA AS A FORM OF COMMUNICATION DURING THE PANDEMIC

In the face of the COVID-2019 epidemic (and the pandemic announced on the 11th of March 2020), societies had to deal with an unprecedented flood of information (information noise). The Internet is a place where views are expressed which often contradict the current state of medical knowledge, using propaganda and persuasion techniques as well as certain target groups' vulnerability to 'conspiracy theories' (Lusawa et al., 2019). Authors of such content can polarize the society (Azzimonti and Fernandes, 2018). Events such as epidemics therefore are accompanied by information panic, whereas the Internet can constitute an intermediary element here.

The total number of Internet users in Poland, as of January 2020, was 28.1 million (Jarynowski and Belik, 2018). As such, the passive representativeness of the Internet (reception of content) was relatively high, but in the active representation (development of own content), groups of younger users and women predominated (as much as 85% of the health-related content posted in social

media was generated by women, with over 99% of young Polish women being regular Internet users).

As of early fall 2020, Google had a 95% reach among the Internet users, with over 8 billion hits monthly, and was an undisputed leader on the Polish Internet market (Bochenek and Lange, 2018). The interest in the 'Wuhan coronavirus' could be measured by the number of queries in the Google search engine, using the Google Trends tool (a free and public service that allows analysis of searches, in terms of frequency and geographical location).

Compared with other parts of the world (the United States, Western Europe), in Poland, interest in this subject generally was low prior to the first half of February 2020 and was still moderate in the second half of February and early March 2020 (Bochenek and Lange, 2018).

According to Google Ads, the average monthly number of 'coronavirus' queries in December 2019 and January 2020 (i.e. when there was no interest in the virus yet) as well as in February 2020 was probably about 2 million, which shows that, at the end of February, the daily number of queries most likely exceeded 50 thousand. Before the virus was confirmed in Poland, interest in other topics, such as sports, gossip, tabloid content, cultural or political issues, exceeded the interest in 'coronavirus', as per both the RSS (Real Simple Syndication) feed measurements and the trends (a list of most popular topics or keywords). The topics and keywords related to 'coronavirus' accounted for less than 10% of the fastest growing topics and keywords (top trends). No topic or keyword related to 'coronavirus' was included in the 25 most frequently searched topics and keywords.

The analysis of queries allows differentiation of two phases of the Polish Google users' interest in the 'coronavirus' topic:

1. The first phase (phase 1) took place at the turn of January and February, when the number of infections increased dramatically in China. It consisted of a small peak around January 25 (death of Dr. Lang Wudong,

a well-known Chinese doctor dealing with SARS-CoV-2) and a large peak on January 29 (first confirmed case in Germany).

2. The second phase (phase 2) came at the end of February, when the number of infections had increased in Italy. A peak was recorded on February 27, perhaps due to the media fuss regarding the alleged SARS-CoV-2 case in Łódź, Poland. The number 'coronavirus' queries in the second phase was almost two times higher than those in phase 1.

There was no effective vaccine or specific pharmacotherapy for COVID-19 (as of early March 2020). When dealing with a worldwide pandemic, the only methods of disease mitigation entail reduction of direct contact (e.g. isolation/quarantine or restrictions for travelers and mass gatherings) and reduction of infection likelihood (e.g. standard isolation, hand hygiene or immunomodulation, such as getting enough sleep).

Phase 1 is a reflection of the still low information needs associated with mere satisfying the knowledge needs and estimation of the risk potential. The information needs increased with the first case of 'coronavirus' infection in Italy. Phase 2 thus seems to have been the best time to implement a fundamental epidemiological information policy. Analysis of Twitter tweets suggests that the ruling camp and the opposition were more involved in the political discussion on the 'coronavirus' rather than in information activity aimed at educating the public. The public media's reach on the Internet, in the 'coronavirus' context, was much smaller than that of private broadcasters. This may mean that information campaigns via public online media reached a smaller number of recipients than it had been assumed based on the information reach via traditional media.

The information needs of Poles in phase 2 increased stepwise, since the threat was defined as serious (lethal) and imminent. It was also observed that by far the most popular search phrase was 'antiviral mask', in relation to personal protective equipment. It is worth noting that, in medical sense, such a term does not exist and may be associated with an atmosphere of fear and anxiety, a prelude to general

panic. Searching for a product that does not exist in the professional circuit of sales, customers could feel that there was no effective way to prevent infection. This fear could expand onto the customers' perception of the availability of other important commodities, such as food, and trigger irrational behavior.

The Internet users' queries indicated poor knowledge of epidemiological prevention measures, while the use of quasi-medical neologisms indicated the Poles' poor knowledge of epidemiology (Medonet, 2020). Such keywords as 'protective mask' and 'quarantine', as well as queries about 'hand washing' and 'hand disinfection' were used rarely. Queries regarding hand hygiene and quarantine-related issues peaked in February and March. Queries about masks peaked at the end of February, but in March the frequency of the search did not change (as opposed to other epidemiological terms), which could result, for instance, from the efficacy of the information campaigns addressing effectiveness of face masks or simply from the lack of their availability.

Masks were a topic searched not only via Google, but also via transaction websites and price comparison engines. In the period from January 10 to February 15, 2020 a manifold increase in the prices of masks was observed on the Ceneo.pl (an e-commerce service for comparison of prices in online shops) as well as in pharmacies. The Poles' queries also concerned the threat itself (e.g. whether the virus was already in Poland or whether it would reach Poland, whether one can die from it, how does it kill) and prevention (e.g. how to prevent infection, how to protect oneself). There were third-line threads as well, such as queries about the symptoms, the history and the restrictions.

The aspect of geographical proximity is also very important, because such expressions as 'near', 'in proximity', 'next to', 'close to' dominated in collocation with the word 'coronavirus'. This indicates certain information needs on the part of the recipients. The first, low level of information needs, entailed estimation of the infection threat

and the potentiality of its occurrence (equivalent of the above-described phase 1). The second level entailed the search for directions of action, i.e. 'how to protect oneself'. (equivalent of phase 2). The third level entailed an attempt to identify the resources needed for action - 'how quickly', 'when', 'how much time' (equivalent of the waiting phase - phase 3).

As of early fall 2020, Facebook had a reach of 79%, with about 4.5 billion hits per month via the browser (Polskie Badania Internetu, 2020). It reached the highest penetration rate among all social media in Poland (with approximately 17 million users) and dominated in almost all demographic categories (age, gender, education, place of residence), except for teenagers. Despite the fact that Facebook does not automatically provide its data for direct analysis, apart from paid advertising campaigns, owing to the companies monitoring the media market, the most crucial information on the Facebook discourse regarding the 'coronavirus' in the period from the beginning of January to February 28, 2020 could be distinguished (Żyłka, 2020). In January, Facebook gained over 120 000 new fans, due to increased activity associated with provision of information about the 'coronavirus'. Prior to the epidemic, Facebook had not been a typical source of medical knowledge with a dominant role of a support network.

The traffic on Wikipedia is another indicator of social activity, constituting a source of knowledge on the perception of the threat of SARS-CoV-2 infection in Poland. Wikipedia had a 57% coverage rate, with over 350 million hits per month, and was characterized by an overrepresentation of persons with higher education and large city (population of over 200 000 residents) inhabitants (in both cases the affinity index was 54 over 115). In order to achieve the research objective, the history of the views and discussions associated with keywords 'SARS-CoV-2' and 'the spread of SARS-CoV-2 infections' was analyzed (*Szerzenie się zakażeń wirusem*, 2020). The trend was rising, with a small peak around February 13th and a clear peak around

February 27th (the peak of interest in phase 2, with a possible additional effect of the rumor about the first coronavirus case in Poland). The first days of March, in turn, were characterized by a slight decrease in the interest, perhaps due to the saturation of the society with basic definitions. The heated discussion concerned, among others, the effectiveness of protective masks and the reliability of the data coming from China.

Popularity of Twitter is low in Poland (about 3 million registered users and a small reach of about 15% of Internet users). It is mainly used by foreigners, journalists and politicians. It provides an API (application programming interface) available to the public, which allows analysis of not only the tweets themselves, but their context as well (tracking, re-tweets, comments, etc.). The large interest in the SARS-CoV-2 infection is observable on Twitter through the frequency of the use of the hashtag #coronavirus in Polish tweets (70 277 tweets within approximately 30 days). Twitter had 2 distinct peaks: at the end of February (Feb. 28.) and the beginning of March (March 3), with a small peak at the end of January (Jan. 29). A rapid (10-fold) increase in the interest, in the last days of February, is worth noting, which may indicate collective intensified activity at the turn of phase 2 and the waiting phases.

YouTube had 68% reach among the Internet users, with approximately 700 million browser hits per month. YouTube streams should be included as well, since it is a smartphone application most frequently installed by Poles (Polskie Badania Internetu, 2020). Among most-watched videos with the keyword 'coronavirus', information programs dominated: videos that had over 1 million hits were uploaded by the Ministry of Health YouTube channel or such channels as 'Niesamowite Fakty' (Amazing Facts), 'Nauka' (Science), 'To Lubię' (This I like). Direct reports from China were very popular as well: channels with over 1 million hits in this category included 'Weronika Truszyńska', 'CJ Channel' and 'Chinese Business'.

Vlogs commenting on current events, with conspiracy theory motifs, were in this group as well: channels with more than 1 million views include 'Wideoprezentacje' and 'Globalista TV'. Many minor expert, political, humorous, financial or stock market video reports could be found as well. Doctors with their professional rights revoked, e.g. Hubert Czerniak or Jerzy Jaśkowski[13], can also count on hundreds of thousands of views. YouTube blocked Jerzy Zięba's channel[14], who, in one of his videos, proposed an intravenous treatment for SARS-CoV-2 infection using infusions of perhydrol (a commercially available bleach). What is more, YouTube uses algorithms that search for such keywords as 'coronavirus' and limit the range of the videos posted by non-scientific accounts. Three peaks could be observed on YouTube, as in the case of all social media, except January, when one peak with two humps occurred in a short period of time (January 28 and 31), a February peak on the 28th and a March peak on the 3rd.

Analyzing the information and content media (Wikipedia and Google), it can be seen that phase 3 (expectations) does not occur, probably because the need for theoretical knowledge about the infection has already been satisfied and Poles mainly became interested in current reports (provided by Twitter, YouTube or electronic media).

It seems that the topic of 'coronavirus' was of less interest for an average Pole (Google, YouTube), compared to other developed countries, but at the same time, it was very strongly marked

[13] Hubert Czerniak and Jerzy Jaśkowski, doctors with many supporters among anti-vaccinees, were accused of committing a professional offense because they spread anti-health attitudes. The anti-vaccine doctors repeatedly argued that vaccines were harmful to children. Their actions were ruled to be inconsistent with the provisions of the code of medical ethics, which oblige doctors to act in accordance with the current medical knowledge.

[14] Jerzy Zięba is one of the most famous and controversial quacks in Poland. He considers the coronavirus disease a conspiracy of pharmaceutical companies to persuade people to get vaccinated. YouTube found this online content harmful and banned his channel.

in social media, Internet media and blogs/vlogs. On the websites that are popular among teenagers (affinity index > 150), such as Instagram, the topic of 'coronavirus' (outside the meme context) was not dominant either (Miotk, 2020).

The boundaries between different types of information and knowledge have been blurred. Consequently, under the conditions of market-consumption society, individuals' private objectives come into conflict entire society' or the community' responsibility; hence the supply-demand effect of increased prices for medical devices as well as other manifestations of the desire to use the epidemic for one's own purposes. Collective behavior was also observed on the financial market (Giełda Papierów Wartościowych, 2020), since, despite the global recession that started in mid-February, caused by disruptions in supply chains and the seed of panic among investors, an increase in the share prices of medical device manufacturers was observed, e.g. Mercator on the Warsaw Stock Exchange (Jan. 20 – March 03, 2020).

Just like information on the SARS-CoV-2, conspiracy theories circulate on the Internet, such as 'the virus escaped from a BSL-4 lab near Wuhan' (*Skąd ten wirus*, 2020), 'it is a US biological weapon providing advantage over China in the trade conflict', or the opposite, 'the virus serves to depopulate the mankind' and 'to form a global government', 'the virus is harmless and serves the interests of pharmaceutical companies', 'the virus is a punishment for the godlessness of the Chinese' (Kolecka, 2020) or 'coronavirus infection can be avoided/treated with hidden therapies that your doctor will not tell you about' (Naczelna Izba Lekarska, 2020). The analysis identified several potential sources of disinformation (such as Twitter and YouTube accounts).

The more frequently information about the 'coronavirus' was repeated, the more important the topic seemed to become (positive feedback). Information bubbles (e.g. on Twitter) caused public information campaigns to have lesser impact on the society than expected

(at least until the first case of the disease). Prior to that, the 'coronavirus' phenomenon had remained a political issue, not a problematic one. For this reason, some of the activity in the field of public health did not receive the due attention of Poles.

## THE CHALLENGES THE POLES AND THE POLISH MEDICAL CARE SYSTEM FACED

To be confined to a very small area was a huge challenge for every family. It was even more difficult at the time when green areas, such as parks and forests, were closed in Poland. Many people had to regain the ability to be together under extremely difficult conditions. For parents who have more than one child and, at the same time, both work remotely, it was extremely difficult to reconcile work, family life and the kids' remote education.

The fact that an increasing number of people got infected and many died caused concern, just as the economic situation. After all, the fact that many companies closed business or temporarily suspended their activity entails human drama.

The change from a business model to a remote one has shown how frequently organizations that are completely unprepared and maladjusted for non-standard times malfunction. Over the past few years, prior to 2020, management experts organized employee trainings in increasingly sophisticated methods of work, in order to help companies become efficient in making profits and enjoy the satisfaction from that. The coronavirus times confronted the knowledge with practice.

It also turned out that many companies (but also schools) did not even have the proper systems and software to facilitate remote work (education). Those who were clinging to outdated procedures and neither let the workers out of their office boxes nor provided them with additional skills, had to face huge problems. Those who did not have any savings or, worse still, took out loans/credit

for everything, were in a pickle as well. Many of those badly-run companies, which for years had been too stubborn and limited by the excel of the previous day to change, clearly could not survive the epidemic.

The Central Statistical Office reported that in the second quarter of 2020, that is, at the very heart of the COVID-19 pandemic outbreak, 64 410 business registrations were recorded, i.e. 31.8% less than in the same period the year before (the smallest number in the past several years), and 157 business bankruptcies were reported, i.e. 19.8% more than in the period from March to June 2019.

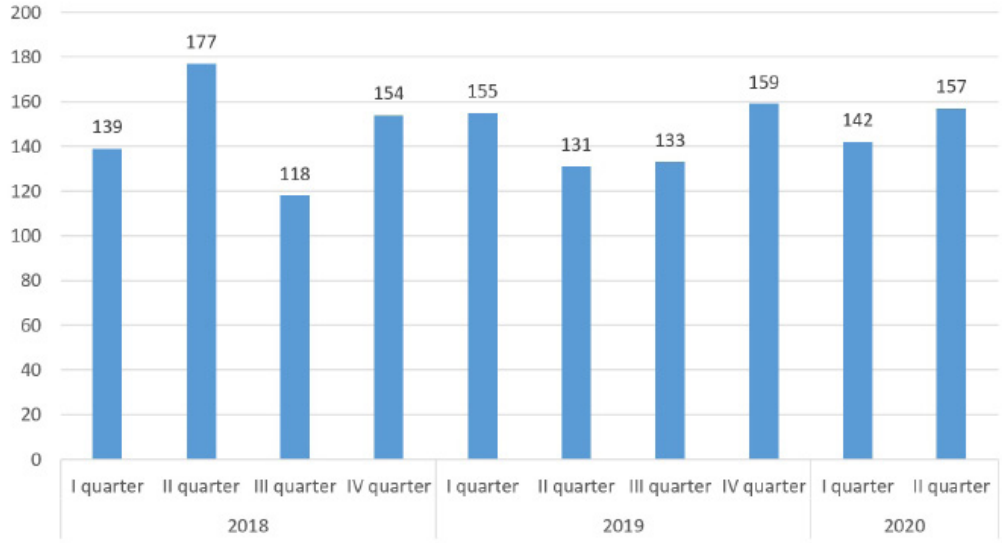
At the turn of March and April 2020, many companies suspended their activity, while there was a growing conviction among entrepreneurs that most of them would go bankrupt, because the first Anti-Crisis Shield (a legislative support package for the entrepreneurs) was, according to the main employer organizations in Poland, insufficient and adopted overdue. Only the subsequent Shields, as well as the most important one - the financial shield of the Polish Development Fund, were well received by the business community.

According to the Central Statistical Office, bankruptcies in the second quarter of 2020 were nearly 20% higher than in 2019. The report on this subject states that the increase in the number of insolvencies had primarily been noted in the following fields (2020 values vs. 2019):

- industry (40 vs. 26),
- services (25 vs.21),
- transport and storage (13 vs. 9),
- accommodation and catering (5 vs. 4).

The Office also reported that a decrease in the number of bankruptcies was observed, e.g. in trade or repair of motor vehicles (41 vs. 44).

*Figure 46.* **Number of bankruptcies in Poland**




*Source*: (Szymański, 2020).

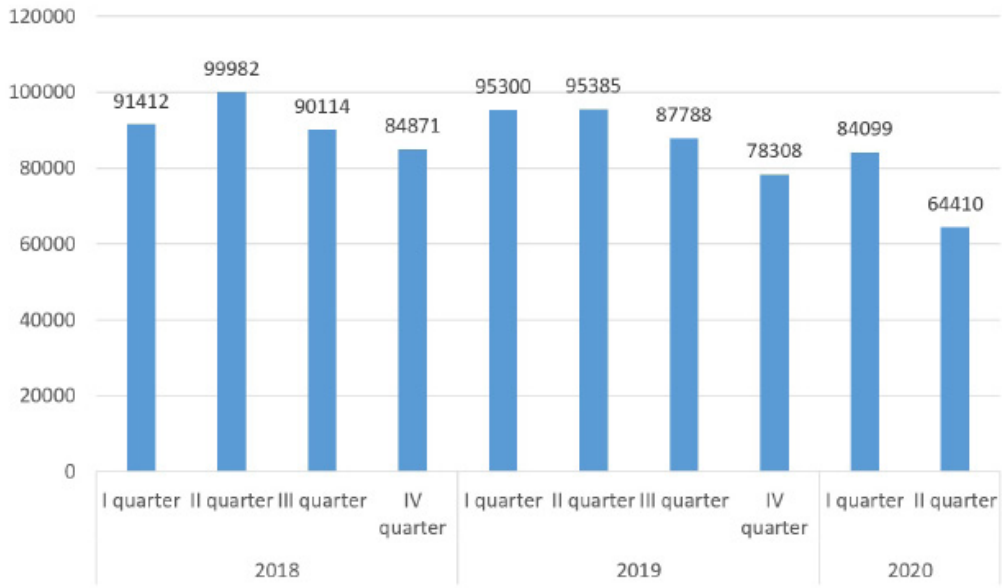
In the second quarter of 2020, the number of business entity bankruptcies increased by 19.8%, compared to the same quarter the year before. The Central Statistical Office also added that the number of bankruptcies in the second quarter of 2020, compared to the second quarter of 2019, decreased among all distinguished legal forms of business activity. Out of the entities which declared bankruptcy, 53.5% were limited liability companies, 22.3% were natural persons conducting business activity, while limited partnerships and joint stock companies in total amounted to 16.6% of all bankruptcies. It turns out that in the era of the pandemic, many Poles registered new companies as well, although this number was one third less than the year before.

The number of business entity registrations in the second quarter of 2020 was 64 410, compared to the 94 385 in the corresponding period the previous year. According to the Central Statistical Office, during that time, less registrations than the year before were observed in all analyzed types of business activity. The biggest drop

in business registration was recorded in construction industry, i.e. as much as 35.0%, and in services, i.e. by 34.3%.

Furthermore, the Office reports that a decrease in business registration occurred in the information and communication sector (by 32.5%), accommodation and catering (by 31.8%), transport and warehouse management (by 31%).

*Figure 47.* **Number of start-up registrations in Polish**




*Source*: (Szymański, 2020).

In the second quarter of 2020, 64 410 business were registered, i.e. 31.8% less than in the same period the year before.

The number of business registrations in the second quarter of 2020, compared to the second quarter of 2019, decreased in all the legal forms of business activity distinguished, with exception of partnerships (20 vs. 19). Natural persons conducting business activity accounted for 83.1% of all business entity registrations, while

limited liability companies for 13.3% (86.9% and 9.8% respectively in the second quarter of 2019).

## CONCLUSION

Crisis situations reveal various potentials and problems, which the Poles were not aware of prior to the pandemic. First and foremost, they learned about existence of certain gaps and deficits in the healthcare system. It was probably the first time that data illustrating the medical personnel deficit was presented publicly. At the time of the epidemic, Poland ranked third to last in the EU (after Romania and Bulgaria), in terms of the number of nurses and doctors per 100 000 inhabitants. These figures are really thought-provoking, and the pandemic revealed the consequences of this state of things.

On the one hand, attempts were made to enjoin doctors to work at home care centers (where the largest outbreaks of coronavirus occurred, apart from the coal mines), and on the other, a ban on multi-employment was being prepared. This only pushed the existing problem aside. There simply was not enough medical personnel. It is a vicious circle - medical staff salaries are very low, because it is believed that they usually get additional income anyway, which means that they are forced to seek extra income, since their salaries are too low. Another matter is that, for one thing, Poles, just as the entire Europe, praised and applauded the medical personnel; for another, medical workers became victims of ostracism. Conversely, the employment holes in the system which the taxpayers' money is invested in had to be patched with personal heroism, while discussion on the healthcare system reform continues and each subsequent ruling team claims to 'heal' it but is not able to do so.

The role resources and local governments play in this game constitutes the third dimension of the problems revealed by the pandemic. Opinions blaming the local governments for various types of situations could be heard. Many people said it is the local authorities that

are responsible for home care centers and county hospitals and they have failed to meet their obligations. A question should be asked - do the new trends, such as consumer minimalism or increased responsibility, stand a chance of persisting? Some believe that the society will not change its approach, because the state of epidemic is considered something unnatural and faultless, which consequently could result in the desire to return to the existing (pre-pandemic) model. What is more, the global economy will strive to rebuild old habits, perhaps even more now than before.

The experience of the pandemic months has revealed how many issues need to be thought about and thought over; above all, how the society is educated and how medical conditions are treated. These are key issues, from a macro-system perspective.

The pandemic has made people aware of many problems that for years had been avoided and denied, especially the issue of social inequality. On a global scale, the problem is gigantic. The World felt sorry for Italy when its crematoria were unable to keep up and when coffins had to be taken to neighboring municipalities, while in Ecuador corpses were lying in the streets and in the deceased's houses. In early fall 2020, it was predicted that the poorest countries would be hit hardest by the effects of the pandemic. It was unknown how situation would develop in Africa, what would happen in India, in the favelas and other areas of poverty, including those in European countries. Looking at societies worldwide, crises hit the economically, physically and competently weaker. In Poland it seemed to be of less impact for the society, but in Belgian, Dutch and British societies, not to mention the United States, the pandemic was like a cold shower. Many gusts of brotherhood could be observed at the beginning of the pandemic, which is typical under the circumstances, but the outburst of social solidarity slowly started to diminish and fade.

# SUMMARY

The objective to analyse the impact of law enforcement policies, social attitudes as well as ways of dealing with the crisis with regard to various spheres of life - economic, educational, medical, cultural and worldview - has been achieved.

From the global public-health-policy perspective, the research presents a discussion on the multiple factors that contributed to the rapid spread of the new coronavirus, which may be attributable to particular social, economic and demographic conditions, but also to the traditionally less prominent role of the public healthcare system in some territories and to the inconsistent mosaic of the laws and policies governing public healthcare.

The situation in these very differing countries, located at completely different latitudes, with different climates and cultures, has shown great similarities.

In both cases, it was noted that the regions with high population density, well-developed infrastructure and connectivity - the provinces of Lombardy (Italy) and the provinces of Silesia and Lesser Poland (Poland) - were the trigger points for the 'explosion' of the spread of the virus. It is not without reason that in both countries the governments were slow to react to the crisis and the healthcare systems proved to be unprepared.

In Italy, the southern regions, despite their less efficient healthcare system, and perhaps precisely because of that, reacted fast, implementing draconian measures, and thus managed to con-

tain the spread of the virus, also owing to the time advantage. In Poland, the regions with lower population density, which are less economically developed, also dealt better with the situation, probably out of the fear that their relatively weak healthcare systems would become overwhelmed. Restrictions were therefore introduced sooner. In the experts' opinion, this quickness was crucial, because the population in these regions statistically is older than in large cities, and there are fewer doctors and hospitals, which are not so well equipped.

Based on the analysis carried out, in both cases, it can be seen that the increased magnitude of the restrictive measures resulted in a decrease in the number of coronavirus infections and a reduction in the load on healthcare-providing facilities.

The more or less homogenous demographics, characterized by high average density but lower dispersion of the population and strong concentration in the large urban areas surrounded by large buffer zones of low density, constituted a protective factor, in addition to the relatively low economic dynamics reflected by the lower territorial mobility and in the reduced international connectivity. Finally, the peculiar distribution of economic sectors allowed minimized travel during the lockdown, which ultimately reduced the spread of the virus

In addition to having explored these aspects, the work revolves around the description of the evolution of the pandemic during the spring of 2020, through analysis of the various measures implemented by regional local governments. In this case, the strong correlation between the containment policies and the trend of the contagion highlights the need to implement, in collaboration with different countries, sectors and disciplines, common and more courageous health policies, which would prioritize public health.

There is a need for a new vision of the future, as to subvert the objectives and the methods of operation when entering unknown fields, both from the perspective of policies and the processes to be

launched in order to overcome fragmentation and divisions. The acceleration induced by the human tragedy associated with COVID-19 can constitute an opportunity for transformation and improvement, similarly to e.g. wars, it can force social innovation and technology at a pace that no government would normally be required to consider.

New relations and unexpected lines of collaboration have been established between public and private sectors. One example of the transformation that a crisis can excite is the cultural experiment which took place in mass digitization: in just 40 days, processes which normally take years were carried out. In Italy, before the beginning of the crisis, only 9% of companies used smart working. In Poland, it was 12% of companies. After a few weeks into the pandemic outbreak, remote working was implemented in 88% of Polish companies and slightly less in Italy. Also, less innovation-driven organizations, such as public administration, radically changed their organizational culture, which not always had negative effects. In fact, these effects often proved positive in many areas - in terms of invalidated conventions, increased scientific innovation, human solidarity, economic and social progress. Humanity has always suffered and struggled with epidemics that often changed the course of events.

The path to follow may not be clear, but immediate and intensive attention to the recovery of global public health policies, as well as attention to the societal needs, not only in economic terms but, above all, in terms of information and the society itself, may prove crucial in dealing with future global crises.

Currently, the second wave of the pandemic is awaited, which has been predicted by scientists for the autumn and winter of 2020. Have we learnt from the first wave of the pandemic? Have we learned to be responsible for ourselves and for others? Will the world ever return to its former level? Or will it never be the same again?

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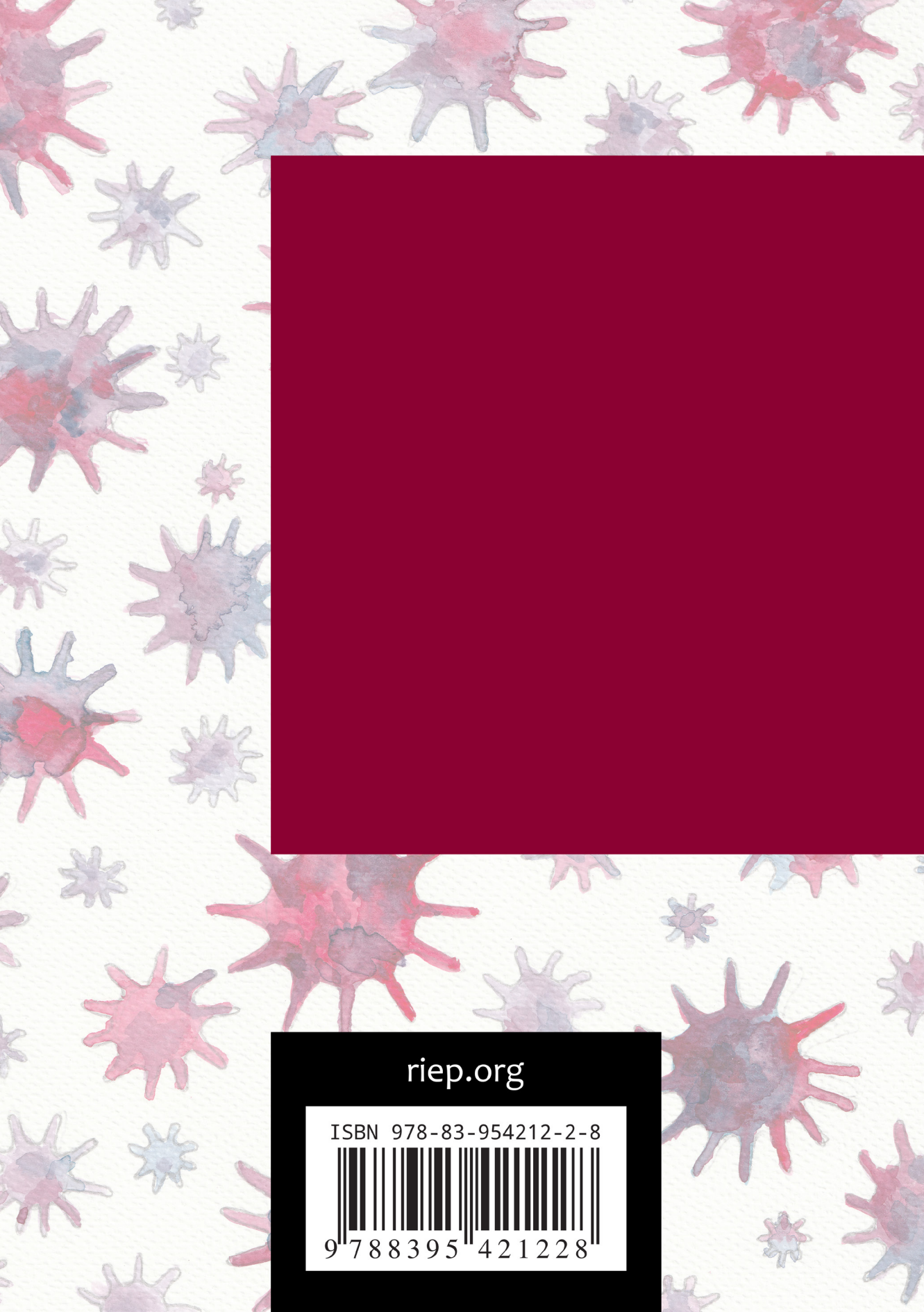

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