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Health system, surveillance and the COVID-19 pandemic response in France

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Abstract *France was the first European country to confirm cases of COVID-19, being one of the most affected by the pandemic in the first wave. This case study analyzed the measures adopted by the country in the fight against COVID-19 in 2020 and 2021, correlating it to the characteristics of its health and surveillance system. As a welfare state, it relied on compensatory policies and protection of the economy, as well as increased investments in health. There were weaknesses in the preparation and delay in the implementation of the coping plan. The response was coordinated by the national executive power, adopting strict lockdowns in the first two waves, mitigating restrictive measures in the other waves, after the increase in vaccination coverage and in the face of population resistance. The country faced problems with testing, case and contact surveillance and patient care, especially in the first wave. It was necessary to modify the health insurance rules to expand coverage, access and better articulation of surveillance actions. It indicates lessons learned about the limits of its social security system, but also the potential of a government with a strong response capacity in the financing of public policies and regulation of other sectors to face the crisis.*

Key words *COVID-19, Health system, France, Public policy, Health policy*

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Introduction

The study of France allows us to understand different aspects of the response to the COVID-19 pandemic. The country is characterized by a consolidated social welfare system, strong public administration[1,2] and a health insurance system that is among the most accessible ones in Europe[1,3]. At the outbreak of the pandemic, France experienced a political context with strong popular mobilization against government measures, strikes in hospitals and the call for municipal elections scheduled for March 2020[4].

It was the first country with confirmed cases of COVID-19 in Europe[5]; however, it was the third to enforce a national containment policy[6]. It was among the five nations most affected by the epidemic, with high mortality rates from the disease in the first wave[7,8], and also started having problems with the resurgence of cases after the economic reopening[9].

Some authors have highlighted the delay in adopting official preventive measures and the government's unpreparedness[2,10], in addition to the contradictory communication in the country[6], at the beginning of the pandemic. Compared to other countries, France showed a unified response, due to the centralized institutional arrangement, with a certain degree of more coercive measures[4]. A comparison between francophone countries showed that the centralized decision-making process contributed to a more effective coordination of health resources and information across the country, in addition to having caused some changes to the health system that tend to remain as a legacy for the post-pandemic period[9].

The literature has addressed many peculiarities of France in the pandemic context, both regarding the relationship between a supposed potential for responsiveness and failure to fight the first wave[11], as well as the controversies related to the government's discourse[12,13] and even the contradictions related to the restrictive measures in the country, a symbol of individual freedoms and criticism of biopower[10]. Some aspects of the health system were addressed, albeit dispersed in several publications and showing no relationship with the health insurance model and the adopted surveillance system.

This study sought to analyze the French response in the fight against COVID-19, the characteristics of its health and surveillance system, aiming to identify reasons for the observed performance and draw lessons for other nations or other health emergencies.

Research strategy

The present is a case study supported by a literature review, documental analysis and secondary data collection.

A search for scientific publications corresponding to the period from January 2020 to December 2021 was carried out in the Pubmed Central, Web of Science, Scopus and Science Direct databases, using a combination of the descriptors "France" and "COVID-19" with "health system", "surveillance", "national response" and "welfare state", with the Boolean operator "AND". Of 222 identified documents, 60 were selected, using the following inclusion criteria: articles that analyzed measures to cope with the COVID-19 pandemic in France or that addressed characteristics of the surveillance model or the French health system. Articles that addressed only specificities of French overseas regions or territories were excluded, as well as those that were not available in English, French, Spanish or Portuguese.

For a better understanding of the institutions, organizational arrangements of the health system and the surveillance model and analysis of general indicators in the country, the publications of the European Observatory on Health Systems and Policies were consulted (https://health.ec.europa.eu/), as well as the Organization for Economic Cooperation and Development (OECD) platform (https://www.oecd.org/). Additionally, in a complementary way, manual searches were carried out and the references cited in the selected articles, which addressed the components and dynamics of the French health system, were identified.

Regarding data on the pandemic evolution and specific measures adopted by the government, the 'Our World in Data' database (https://ourworldindata.org/) and French government websites (www.data.gouv.fr) were consulted.

Data extraction took place according to the analysis matrix, which included the following dimensions: 1) identification of the country and demographic indicators; 2) characteristics of the state/government; 3) characterization of the health and surveillance system; 4) responses to the COVID-19 epidemic; 5) evolution of the epidemic in the country.

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The French government and compensatory policies in the face of the pandemic

France is a unitary, republican State, with a semi-presidential regime[9], a typical social-democratic capitalist country[14]. It has a centralized public administration, in which the main public tasks are carried out by the national government[4]. However, it has some level of decentralization, through the municipalities, departments and regions, with relative autonomy in areas that are clearly defined as having their competence[15].

From a geographical point of view, it is the largest country in the European Union (EU) in area and the second most populous in this region, being largely urbanized and showing high population density[16]. It has the tenth highest Gross Domestic Product (GDP) in the EU, the seventeenth Gini index among OECD countries and high life expectancy at birth, considering both sexes[16]. Overall, it has above-average indicators in relation to its European neighbors.

The country is known for its social welfare system, with strong public funding of health and social assistance[9,15]. Vulnerable, low-income families are entitled to a fixed social assistance benefit of €150 and an additional €100 per child[17].

In the pandemic, the country was the first whose Minister of the Economy and Finance declared the need and urgency of economic measures to contain the pandemic effects[18]. Similarly, the French president also stood out regarding how promptly he made declarations of support to companies in the country, aimed at preventing unemployment and bankruptcies[13]. It was one of the countries to implement unprecedented financial support measures, with a 5% increase of the GDP in the national budget, in April 2020[9].

During the pandemic, social security actions were expanded, both to increase health care and to help companies and mitigate the social consequences of the shutdown of the economy[7]. Unemployment insurance was extended from 6 to 12 months, a solidarity fund was created to support small businesses, and monetary subsidies were implemented for self-employed workers, in addition to several types of cash transfers to be paid to people who already received the benefit of minimum income transfer[17].

The country also had at its disposal the EU initiatives to help workers maintain their income and support companies to remain active. These initiatives included government assistance to companies that reduced the workday of employees or that completely interrupted their activities, income replacement for self-employed workers and support for fishermen and agricultural workers[18].

The French health system and its capacity to fight the pandemic

The country has a mandatory social health insurance system, financed by contributions from employers and employees, in addition to taxes on income and additional sources, such as taxation of tobacco, alcohol and pharmaceutical products[15]. Created in 1945, the French health system initially offered coverage based only on professional activity, but over the years it has sought universal coverage and greater uniformity of protection among different funds[2,8,19]. Social Security covers legal residents in the country[7] and a scheme, fully funded by the Government, provides access to an essential care package for unauthorized migrants[8].

After Germany, it has the highest percentage of the GDP spent on health in European countries and more than three quarters of health expenses correspond to public expenditures, of which approximately one-third are spent on hospital services[8,19] and only 2% are aimed at prevention[8]. With a more centralized governance than other health insurance systems[15], the provision of services is a responsibility of the national government, which regulates it and negotiates with providers and insurers, with a small part of the operations delegated to the Regional Health Agencies (RHAs)[9].

It stands out among the best health systems in the world regarding coverage, accessibility[3], quality and effectiveness[19]. However, it is still faced with socioeconomic and geographic inequalities, both related to the risks for diseases and illnesses, as well as disparities in access to services[15], in addition to the challenges related to prevention and continuing care actions[19]. It is considered a complex system with poor coordination between the different levels of care[2]. Moreover, as it is still a hospital-centered system, it is suffocated from the management and financial points of view, due to the high costs and complex operation[20].

Service provision is carried out by public and private institutions, with hospital and long-term care services being mostly public, whereas outpatient services are mostly private[9,15]. The use of health services is based on the co-payment system, in which the proportion of social security coverage is higher for hospital care and lower for other services and products[19]. This co-pay-

ment reality and the search for better coverage for some types of specific services make 95% of the population contract supplementary health insurance[8]. This makes the direct expenditure for health services in France one of the lowest in Europe, but still corresponds to almost 50% of expenses on non-hospital services by those who do not have supplementary insurance[19].

Primary and secondary outpatient care is mainly provided by self-employed professionals and, to a lesser extent, by salaried staff working in health centers and hospitals[19]. There is no organized service network at the primary care level, only the individual search for a general practitioner by the patient[9]. To favor the coordination of care for chronic conditions, social insurance has offered advantages in the percentage of coverage for people who see a general practitioner before consulting a specialist[19].

The country has reduced the number of hospital beds in recent decades and has a number of doctors below the EU average[8]. As the distribution of these professionals is unequal throughout the country, the government has offered incentives to retain physicians in some regions with greater scarcity[8]. Additionally, efforts have been made to expand the scope of practice of other professionals, such as nurses and pharmacists[8,19].

In addition to Social Health Insurance, the country has the French Public Health Agency (SpFrance), which defines national health strategies and guides the RHAs[9,21]. One of SpFrance roles is the attribution of coordinating epidemiological surveillance, in an articulation that involves physicians, RHAs and national health authorities[5]. It is considered an extremely time-consuming process that requires a considerable workforce[5]; additionally, many different information systems are used[22,23].

Shortly before the pandemic onset, the health system was affected by months-long protests and strikes by hospital workers, demanding more resources[2]. Faced with particularly severe financial constraints resulting from activity-based funding, the hospital system has for some time sought to optimize scarce resources and concentrate its efforts on certain medical specialties, which led to many difficulties with the emergence of the pandemic[24].

During this period, even with the decrease in the GDP, public spending on health increased, with additional investments to expand hospitals[8], finance equipment and increase the workforce[9]. Social Security expanded the access and compensation of costs with the diagnosis and treatment of COVID-19[7,8,25]. The government increased the contributions from supplementary health insurance companies to help the national insurance fund to finance the costs of the health crisis[25].

Despite the adopted measures, the impact of pre-existing weaknesses in the health system, added to the epidemic severity, led to the worsening of health conditions, including the discontinuity of routine care, which has been related to some difficulties the country had in coping with the health crisis[2,8,11,25].

The national response and the epidemic evolution in France

As soon as China disclosed the existence of the new virus, France started investigating suspected cases and established hospital institutions and reference laboratories[5]. The first cases were confirmed on January 24, 2020 and the preparation of the 'Coping Plan' started, based on the prepared plan for pandemic influenza[6].

A notable characteristic in the health crisis management in France was the centralization of decision-making at the national level[25,26], with emphasis on the role of the Executive Branch[27]. The coordination of the response fell to the Defence and National Security Council, whose natural president is the President of the Republic, in addition to the participation of the Prime Minister and other ministers appointed by them[8].

The Coping Plan was not immediately implemented and it took the government some time to adopt the first preventive measures[2]. Even with the first outbreaks in some regions[9], the adopted measures were not incisive ones[3,4,6]. This attitude has been mainly related to the need to maintain the scheduled elections[4,6,12], but also to the fear that strict measures could intensify popular demonstrations that were already occurring before the pandemic[28].

When the Coping Plan was implemented, on February 23, the disease was already rapidly spreading across the country, with restrictions being established for some activities and social isolation being implemented in some regions[2,4,6], which did not prevent the increase in cases and resulted in signs of panic among the population[6], whose reaction had not been triggered by the situation in other countries[29]. Nevertheless, it was only on March 16, after the municipal elections, that the government completely changed its conduct, by implementing the national lockdown and adopting the discourse of "war against COVID-19"[2].

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The pandemic evolution in the country, between February 2020 and June 2022, can be characterized by four periods of increase in the incidence rate of the disease, generically considered as "waves" (Figure 1).

The country's response was adapted according to the pandemic dynamics[30], with stricter measures at times when the government was pressured to do so, due to the increase in the number of cases[2]. From one perspective, legal support was sought for exceptional coercive measures[4], with the approval of the State of Emergency Law[31]. From another perspective, committees of experts were appointed seeking to provide scientific support for the decisions[8]. A first commission of physicians and epidemiologists had the task of indicating general measures to prevent the spread of the disease[2,12,28], whereas the second commission, which had members in common with the first and was chaired by a virologist (the recipient of a Nobel Prize in Medicine), was more focused on innovations in treatments, tests, screening and so forth[12].

The appointment of these commissions has been, in part, criticized, since SpFrance already had government bodies with these attributions and accumulated experience[12,27]. The measures were monitored and supervised by the Parliament, with the participation of civil society, who monitored reports sent by the government[7], and sought to respond to the population's demands[12]. Between the two first waves, the mayors received authorization to adopt some necessary measures based on the local epidemiological situation, but this power was once again restricted in the course of the second wave[2].

During the first national lockdown, between March and May 2020, there was great concern about the economic impact on the country[2,9,32]. To allow the lockdown suspension, efforts were made to expand testing capacity, with mobile facilities[20,23] and the country's reopening strategy was designed gradually, varying between regions according to the epidemiological situation[33]. This was accompanied by home monitoring of cases through an application[22] and, later, the mandatory use of face masks[12] was adopted.

However, with the reopening, the population's adherence to preventive measures was reduced, which made the scientific commission recommend to the government, as of September 2020, the reduction of the quarantine time to seven days and the offer of incentives and compensation for adherence to the regulations aimed at COVID-19 prevention[28]. The government accepted a shorter quarantine but did not adopt the recommended incentives[28]. And, despite the increase in testing and greater agility in case detection[23], screening and isolation measures were not effective during the summer and autumn of 2020, which, associated with low adherence to restrictive measures[12], contributed to the second wave of the epidemic in the country, leading to a new nationwide lockdown in October 2020[2].

In this second wave, the resurgence of cases was not accompanied by the same levels of concern as in the first, probably due to the expansion of installed capacity for COVID-19 care[9]. The period that corresponds to this prolonged wave had moments of greater intensification and some specific mitigation measures, until the gradual reopening started in May 2021, when the country already faced the challenge of non-acceptance, by the population, of long-lasting restrictions[30,34,35].

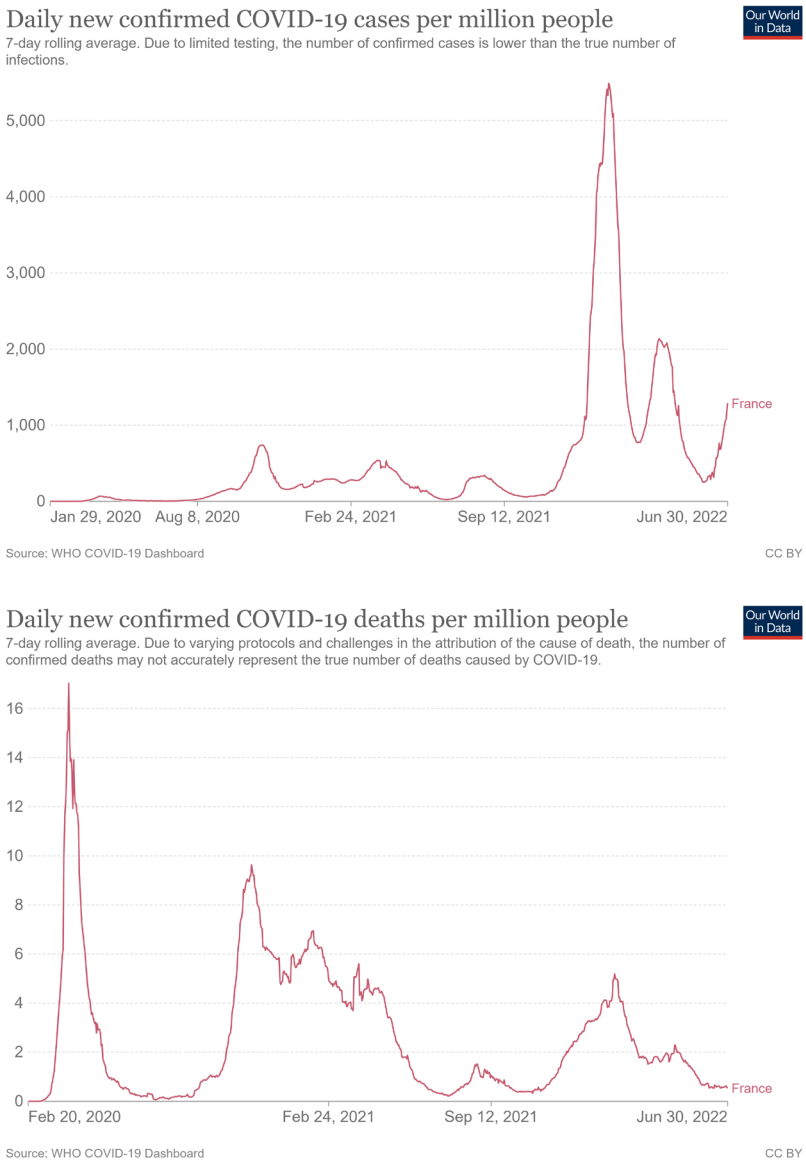
In the meantime, the vaccination plan was implemented in January 2021[21], with the initial objective of vaccinating the entire population within a period of six to nine months[30]. Therefore, the reopening that followed coincided with the rise in the vaccination coverage curve and, even in the face of controversy and resistance from part of the population, on June 9, 2021, the *Passe Sanitaire*[36] was implemented, i.e., proof of vaccination that started being required for access to entertainment establishments and long-distance public transport[21].

At the end of August 2021, almost 60% of the population had a full vaccination schedule[8], therefore, lower than expected[30]. This delay in vaccination coverage, added to the prevalence of the Delta variant and the population mobility during summer, contributed to the third wave observed in the country[37], a situation that became even more dramatic in this period due to the low adherence to protective measures, caused by the prolongation of the pandemic[30].

The main strategy to fight the pandemic thus became vaccination and the maintenance of the health system's strategies for the caring of COVID-19 cases, associated with preventive recommendations. Even with the emergence of the two other waves, resulting from the Delta and Omicron variants, France did not experience restrictive measures once again, as in the first and second waves.

Actions that comprise the response of the French health system

France based the implemented measures on experiences with previous epidemics, as well



First wave: February-April/2020. The lowest morbidity rates among all periods, but with the highest mortality rate. Higher concentration of cases in two regions of the country.
Second wave: July/2020-July/2021. With an impact on all regions of the country, it was the longest wave, with two distinct peaks and a higher incidence of cases than the first wave. It resulted from the overlapping of two variants, starting with the resurgence of the original variant, crossed by the Alpha variant, which became dominant in February/2021. It showed mortality peaks lower than the first wave; however, higher than the following periods, with a gradual reduction in mortality, as the vaccine coverage increased.
Third wave: August-October/2021. Morbidity rates were lower than the second wave, probably caused by the Delta variant; it had the lowest mortality rates compared to the other waves.
Fourth wave: November/2021-June/2022. As a result of the Omicron variant, it had the highest peak incidence of cases, exceeding by five times the rates of the second period, which had been the highest until then. Mortality was about a third of that observed in the first period, which was the highest the country had during the pandemic.

Figure 1. Course of the COVID-19 epidemic in France, based on the analysis of the curve of confirmed cases and deaths, between January/2020 and June/2022.

Source: https://ourworldindata.org/.

as on examples of successful measures in other countries to fight COVID-19[6]. Chart 1 summarizes the main actions related to the health and surveillance system, in some dimensions, which were implemented during the pandemic.

Performance and main problems when facing the crisis

Some analyses point to the failure of risk communication by the French authorities, at first, impairing public awareness and better behavioral responses[6,13,29]. In Western Europe, the French people were those who trusted government measures the least, or even information from the scientific community[7].

The country's inadequate preparedness led to a shortage of basic supplies [6,12] and contributed to the spread of the epidemic, which required the government, within a seven-day period, to change its orientation from light restrictions to a complete lockdown, with intense monitoring and enforcement of fines[9]. Criticisms were diverse, both from the press that accused the government of putting the population at risk[10], and from segments of society that warned about the compromising of individual rights caused by the adopted measures[7].

There were also criticisms regarding centralization, lack of transparency related to the decision-making process and low cooperation between actors at central and local levels[44], aimed to better equalize the availability of professionals and increase the installed capacity, according to the regional epidemiological situation[2]. However, there are those who consider that centralization contributed to the effectiveness of the measures[9], or even that the establishment of the Emergency Law, with parliamentary supervision and spaces for monitoring by civil society, balanced the guarantee of individual freedoms and the effective disease control[6]. With the first national lockdown, mobility was reduced by up to 60%[22] and that proved to be the right decision, according to a study of mathematical models, both in terms of reducing mortality and system overload[32].

Even if for some authors the system model is not enough to explain the response to the pandemic[31], in countries with national insurance, in which the health system does not have a central role in decision-making, differences in installed capacity, governance and operational dynamics

Chart 1. France initiatives to face the health crisis, 2020 and 2021.

Logistics and expansion of the established capacity
. Use of the army to set up hospitals, apply roadblocks and transport patients[2,9,38,39]; . Release of beds in hospitals, with cancellation of non-urgent interventions[7]; . Monitoring of bed saturation using a hospital system data panel[22]; . Prioritizing face masks for symptomatic patients and health professionals and preventing the rise in the price of hydroalcoholic gel at the time of greatest scarcity[6]; . Expansion of hospital capacity[2,8,9]; . Reorganization of the industry for the production of face masks and disinfectant gel[6]; . Increase in public funding to complement the health professionals' salaries and cover expenses with Personal Protective Equipment (PPE) for the population[9]; . Reallocating employees from non-priority sectors, recruiting more workers and volunteers, increasing working hours[2,9,20].
Epidemiological surveillance
. Improvement of the case and contact monitoring process[5,22]; . Increasing the capacity of laboratories for testing[5]; . Update of detailed epidemiological statistics[9,22]; . Improvement/creation of applications and information systems[9,23]; . Increase in the role of general practitioners in the testing, notification and tracing process[25]; . Articulation with the surveillance system to monitor victims of attacks and special health situations[22]; . Generation of a centralized database for all data on virological tests[9,23]; . Gradual expansion of testing, with guarantee of reimbursement by Social Security [9,12,20]; . Social Security coverage of consultations and tests for contact tracing[25].
Incentive to research
. Issuing Notices related to COVID-19, with faster selection and implementation by the Ethics Committees[34].

it continues

Chart 1. France initiatives to face the health crisis, 2020 and 2021.

Patient care
. Implementing referral hospitals, based on the first suspected cases[5]; . Use of the already available scientific base and the experience with SARS and MERS for the treatment of the first cases[40]; . Provision of guidelines for clinical management by the High Council for Public Health, based on studies and support from the WHO[41]; . Transfer of patients from the most affected regions to neighboring countries with greater care capacity[7,12]; . Testing and treatment, initially restricted to hospitals, were gradually reorganized to outpatient services[25]; . Defining the role of general practitioners by issuing guidelines for clinical management and extra payment for consultations related to COVID-19[25]; . Coverage of 100% of expenses for COVID-19 treatment by Social Security[7,25]; . Training of nurses working in different sectors to work in the ICU[8]; . Guidance on prioritization criteria in case of saturation of ICU beds, by the Ministry of Health[24]; . Encouraging the use of teleassistance, with teleconsultation coverage by the Health System, for less severe cases, while maintaining access to continued care[8,9,22]; . Issuing of clinical practice guidelines for multidisciplinary teams assessing and managing long-term effects of COVID-19[8]; . Creation of measures to facilitate access to care for vulnerable groups, as in the case of migrants[8].
Vaccination
. Implementation of vaccination in a centralized way to guarantee the quality of vaccines throughout the logistics chain[21]; . Implementation of a specific surveillance system for vaccines, with daily analysis of notifications and weekly issuing of expert reports[42,43]; . Boosting vaccination, with a constant supply of vaccines and expanding the team of professionals in charge of vaccination[21].
Communication with the population
. Daily press conferences, held by French health authorities in the first months of the pandemic, on the status of case investigations[5]; . Daily publication of an official panel with epidemiological statistics, by SpFrance[5,9]; . Guidance on behavioral measures constantly emphasized by the authorities, starting from the second phase of the Coping Plan[6]; . Institution of mechanisms and laws related to the "open data policy", allowing the government to publish data and administrative documents[9].

Source: Authors.

influenced the quality of the response[25]. This can be observed in the French case.

The crisis revealed the health system weaknesses, indicating the need for structural reforms, both in governance and relations between central levels and local government bodies, as well as in the care model, organization of a care network, funding mechanisms, and ordering of the workforce[2,8], in addition to the installed low hospital network capacity[24], weakened by several decades of austerity policies[10].

Having the hospital as the preferred place to provide health services may have favored the contamination of more people by the virus and generated more demands for the system[12,20]. Moreover, the lack of coordination of care by an outpatient network compromised actions at the beginning of the pandemic, and the role of general practitioners was clearly defined only after the end of the first national lockdown[25].

The system went into collapse in the most affected regions[6,12], and an excess mortality rate was high in the first wave of the pandemic[11], with emphasis on the deaths among the elderly[9], which may have been influenced by the low coverage of the Influenza vaccine, which had already been occurring for some years[19], as well as the discontinuation of routine care[8]. The health system capacity remained insufficient, even with the low epidemic activity[23] and, between March and November 2020, 75% of the patients died without having access to an ICU bed[45].

The fragmentation of the systems and mechanisms for collecting sociodemographic informa-

tion and the difficulty in monitoring 100% of the national mortality by SpFrance prevented a more accurate analysis of the profile of COVID-19 cases and deaths[5,9] and local and regional needs[24]. Deaths that occurred at home were not monitored[9] and analyses of the impact of socioeconomic, socio-professional and ethnic-racial factors on mortality could not be carried out[10].

Low testing rates at the beginning of the pandemic underestimated the incidence rates of cases and deaths[22], since the laboratory test was a necessary criterion for defining a case[5]. Since no mass screening was systematically performed on a national scale[20], case and contact tracing was hindered due to underdiagnosis[31], leading to an overestimated case fatality rate.

At the beginning of the pandemic, there were not enough basic supplies or personnel for testing[6,12], in addition to the underutilization of public laboratories[12]. Moreover, the hospital-centered care model restricted testing to the most critically-ill patients at the beginning of the pandemic[22]. Additionally, the requirement of a medical request to guarantee reimbursement (which at the beginning of the pandemic was 60% of the charge paid for the test)[2], discouraged patients with milder cases from taking the test[23]. Early attempts to increase testing capacity led to long queues and delays in delivering test results[12].

As the course of the epidemic progressed, problems related to vaccination arose. With a history of the anti-vaccine movement, 25% of the French people, from the beginning, had already declared they would not be vaccinated[7]. There were public demonstrations against mass vaccination, with emphasis on the hesitation or reluctance of around 25% of health professionals, at the beginning of the vaccination campaign[21]. Additionally, there were moments of vaccine shortage, especially in March 2021, when the country had to suspend the use of the AstraZeneca vaccine due to adverse effects[21].

Therefore, although the vaccination coverage showed an upward curve, the country did not make progress towards achieving the coverage target intended by the plan that was initially prepared, which may have contributed to the maintenance of the mortality rates due to COVID-19 above the expected, mainly due to the low vaccination of the elderly[30].

Final considerations

The response of France to the COVID-19 pandemic demonstrates the successful aspect of the national coordination of the response and the pre-existing government mechanisms of social protection; however, it discloses weaknesses related to the political decision-making process and characteristics of the health and surveillance system. The adopted measures varied according to the epidemiological situation, the increase in self-sufficiency of supplies, system's capacity, the development of knowledge about the disease, the discovery of vaccines and the difficulty in maintaining restrictive measures for a prolonged time.

Although the institutional devices aimed at facing health crises identified the first suspected cases early on and the fact that the country had had experience in facing previous epidemics, France did not take the opportunity to prepare itself in a timely manner and prevent the spread of the disease and the health system collapse in some regions during the first wave. The political field interests around the elections overcame the needs arising from the epidemiological situation.

The fragmented epidemiological surveillance system, disconnected from service provision and, with limited information collection, hindered the analysis of the health situation to guide timely actions. On the other hand, the health insurance system, with its reimbursement and co-payment mechanism, hospital-centered and without coordination of the outpatient network, also constituted important obstacles for the initial fight against the pandemic.

The national lockdown as a strategy for moments of higher incidence of cases, before the expansion of vaccination coverage, was a strategy that showed to be effective in controlling the pandemic; however, the increase in public funding for health actions was crucial, as well as changes in health insurance rules to expand coverage and improve the outpatient network. The importance of initiatives to improve surveillance actions is also highlighted.

This analysis has limits, as it is supported by a literature review and secondary sources which, for instance, led to greater detailing of measures taken in the first year of the pandemic. However, it allowed the systematization of elements of the French response to the COVID-19 pandemic, related to its health and surveillance system, which can be used as an example for other countries, both regarding its potential and what can be learned from the limitations in the structure

and dynamics of the health system operation and the performed changes, in addition to the set of articulated government's actions to meet the specific reality of the country.

Therefore, the French response offers a lesson on the advantages of national coordination, with stronger lockdowns and measures at peak times prior to the expansion of vaccines, but which, after the expanded vaccine coverage, added to the difficulties of maintaining the restrictions, became more flexible, trying to ensure adequate care for cases and prevent the severe forms of the disease. It associated compensatory measures to protect the economy, changes in the health system and tried to balance the restrictive measures with the wishes and resistance of the population. Nevertheless, the strong role of the government must be highlighted, both concerning the financial investment and as a regulator, with regard to the rules of public and private insurance, organization of the productive sector and collection of taxes to face the crisis.

Collaborations

L Angeli-Silva: conception of the research, data collection, analysis and interpretation, writing of the manuscript. JVP Santos: data collection, analysis and interpretation, writing of the manuscript. MA Esperidião: conception of the research, data analysis and interpretation, critical review of the content.

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