



## COVID-19 - HEALTH CARE MANAGEMENT

# COVID-19: yesterday, today and tomorrow. The quality of COVID-19 management and the evaluation of the “Health” chapter of the Recovery Plan

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## Keywords

COVID-19 • Quality management • Local health • Digital healthcare • Recovery Plan

## Summary

**Introduction.** The COVID-19 pandemic represented an unprecedented challenge for the healthcare world and the introduction of a new stronger and believable project plays a fundamental role for the quality of work and the provision of qualitative care.

**Aim.** The survey provided by Italian Association for the Quality of Health and Social Care (ASQUAS) aims to examine the impact of “Health” chapter included in the Recovery Plan, through the assessment of management quality of the COVID-19 pandemic.

**Methods.** Starting from a literature review, in September 2021, a web-based survey has been conducted and administered by e-mail. It has been taken into account measures widely used by different healthcare structures in order to analyze the projects implemented in the face of pandemic and to evaluate the new real possibility to invest funds in new healthcare structures and projects.

**Results.** The survey consists of 19 multiple choices and respondents were from different types of structures, including regional

departments and regional health agencies (1.4%), universities, research centers and scientific hospitalization and treatment institutes (IRCCS) (11%), hospitals and university polyclinics (34.2%), Local Health Authorities (39.7%), socio-health organizations and Others (13.7%). The pandemic has highlighted many vulnerabilities at both hospitals and territorial level. The major weaknesses revealed by the survey are mainly due to the lack of support from new staff units and poor availability of specific training tools for COVID-19 procedures. The Recovery Plan is still unclear with a lot of concern about the implementation and many limits of diffusion.

**Conclusions.** It becomes essential to guarantee a new effective and interoperative model of integration. Today we can start more aware for the implementation of a system closer to everyone's needs, making shortcomings the new strength and starting point.

## Introduction

Coronavirus disease 2019 (COVID-19) outbreak has heavily influenced almost all the world's healthcare systems. COVID-19 is an infectious respiratory disease caused by SARS-CoV-2, a highly contagious virus that belongs to the coronavirus family, which was a stressor of the healthcare systems.

Italy was the first European country to be heavily hit by the pandemic.

In Italy, the COVID-19 pandemic has caused more than 14 million cases of infection and over 156,588 deaths to date [1]. It is meaningful to stress that the epidemic mainly affected the country's northern area during the first wave and spread more widely throughout the country in the summer months and during the next wave [2]. However, COVID-19 disease did not cause the same mortality everywhere, but it occurred with extreme variability in the Italian regions. It is difficult to

establish the reasons for these differences, which should be source among a very comprehensive range of factors (such as organizational deficiencies, initial delays in understanding the seriousness of the emergency, deficits in infection tracking systems, different levels of aggressiveness of the virus, individual behavior and choices of central and local governments) [3].

To properly face this emergency, the Italian health system should have been equipped with clear guidelines and important organizational and managerial skills to react promptly.

Healthcare workers had to face challenging and unknown scenarios, not always enough supported by current management strategies and facilities. They had to withstand an enormous physical effort and, in particular, an unexpected psychological and emotional burden.

But, while, the pandemic needed a strong central intervention of coordination and impulse, given the “health decentralization” and, consequently, the greater autonomy of Italian Regions in the organization and

management of health services [4], each Italian Region has adopted its own strategies to face the pandemic. In fact, the greatest disparities have been felt in the provision of services in terms of prevention and assistance, poor integration between hospital, territorial and social services, as well as very high waiting times for many other services and pathologies [5].

It can be said that where territorial health care has been weaker, there have been more infections and higher lethality [6, 7].

The existence of a healthcare system based on the hospital as the center of every problem has proved to be totally inadequate, leading to increasingly integrative and connected solutions.

According to this scenario, the new perspective outlined by the Recovery Plan, the largest recovery reform plan ever funded in Europe, responds in a very coordinated way to the needs highlighted by the pandemic and to the need for an integrated approach between the hospital and territorial network. Developing a “close and digital” healthcare conceived by the plan passes various challenges and objectives.

The first challenge is represented by developing a model of care for prevention and management of chronic diseases oriented to health promotion (initiative healthcare), which does not wait for the patient in the hospital or another health facility. However, it takes care of him proactively in the early stages of the disease’s onset or evolution [8].

The second challenge is represented by the rethinking of services, with better performing hospitals, new territorial and home care, community care, and the achievement of a critical unitary vision on E-health, care, and assistance able to operate online [8].

Last but not least, it is necessary to strengthen the sense of belonging to a single integrated system and the ability to work together as one big team [9, 10]. Being aware of the shortcomings and new opportunities is the first optimal way to heal our health system from a long-term perspective and to talk seriously about resilience.

The survey aims to understand the future needs and challenges of our healthcare system, starting with the analysis of healthcare management of the COVID-19 pandemic in Italy after 18 months from the first wave. It wants to highlight lacks and weaknesses of healthcare system, but also starting points for improvements.

In addition to this, the study investigates on the “Health” chapter of Recovery Plan, evaluating expectations and doubts of its introduction.

## Methods

To better understand the major limitations and future needs that the pandemic has highlighted, a web-based survey proposed by the Italian Association for the Quality of Health and Social Care (ASQUAS) was set up and administered in September 2021, after 18 months from the first wave of the COVID-19 pandemic [11].

At first, in order to outline the impact of COVID-19 on healthcare workers’ wellness and mental health, an extensive search of the main evidence-based literature was performed.

The treated items in the survey are provided by government organizations, published literature, evidence-based practice, and Recovery Plan [8, 12-15]. Following the review results, a structured questionnaire was defined and shared within the working group for validation.

The survey consists of 19 multiple choice questions and it is composed of three sections:

- management quality of COVID-19 pandemic;
- implementation specificity for COVID-19 pandemic;
- evaluation of the healthcare chapter of the National recovery and Resilience Plan (PNRR).

The great advantage in proposing this type of study derives from the presence of different types of structures: regional departments and regional health agencies (1.4%), universities, research centers and scientific hospitalization and treatment institutes (IRCCS) (11%), hospitals and university polyclinics (34.2%), Local Health Authorities (39.7%), socio-health organizations and Others (13.7%). (Tab. I)

The questionnaire was created using Google Modules and then, spread by e-mail.

Concerning with the sample size, Local Health authorities, University Hospitals and Polyclinics, Universities/Research Centers/IRCCS and others such as Consulting and design firm in network health systems, Nurse, Provincial health authority, Scientific Association, Faculty of Medicine and Psychology/AUC Sant’Andrea, I-Tel srl, Institute of private medical analysis, Hospitalier Physiotherapy Institutes IRCCS (IRE-ISG) of Rome, Regional company, Regional health emergency company, Regional departments and regional health agencies were invited and answered to the survey. Respondents were asked to fill the form anonymously. Participation was voluntary.

The answers were collected immediately, and descriptive statistics on the frequency distributions and percentages were reported through pie and bar charts.

Data were analyzed using Microsoft® Excel (2016). We performed a descriptive analysis of collected data. Univariate and bivariate statistics were used to describe the need of future investments in the NHS by using SPSS.

Tab. I. Type of membership structure.

Type of structure	N°	%
Ministero AGENAS ISS	1	1%
Assessorati Regionali e Agenzie Sanitarie Regionali	1	1.4%
Università/Centri di Ricerca/IRCCS	8	11.0%
Azienda Ospedaliera e Policlinici Universitari	25	34.2%
Azienda Sanitaria Locale	29	39.7%
Others	9	12.3%
<b>Total</b>	<b>73</b>	

Tab. II. Future investments.

The lesson of COVID-19: looking forward 12 months (September 2022), what it would invest in and at what level of governance?	%
Technological and instrumental equipment (diagnostic equipment, PPE)	39.7%
Administrative equipment (information systems, computer systems, etc.)	52.1%
Management equipment (provision of specific guidelines, organizational tools, etc.)	39.7%
Staffing	60.3%
Logistic equipment (spaces, logistic routes, supply chain, etc.)	52.1%
Training tools	34.2%
Re-planning of hospital networks	1.4%
All of the above	1.4%

## Results

The questionnaire had an high compliance rate (about 35%): 73 participants out of about 200 invited, without recall.

The survey reveals a predominance of structures belonging to Central Italy (72%), while fewer in the North (21%) and very few in Southern Italy and islands (7%).

The population interviewed is composed of a huge variety of healthcare professions (both employees in managerial or administrative field and doctors who act on the ward). The most represented gender is female and the average age belongs to the group of over 50 years old (67%), followed by the group between 35-50 (28%) and only a few in the group of under 35 (5%). It shows a high emotional involvement in the consulted subjects; in particular it was found that they were little supported from both a logistical and a psychological side. This underlines a high emotional impact.

Furthermore, it appears that 41.4% of the respondents feel fairly prepared in teamwork, communication skills, leadership and organizational abilities. This points out how soft skills play a fundamental role in difficult situations such as the pandemic.

In addition, the questionnaire reveals a fair technical and cultural predisposition to follow specific guidelines on quality and safety, management protocols or managerial

techniques; however, there is no clear position in positive terms, underlining the need for a greater support and updating network.

Concerning the major shortcomings, it emerges a serious shortage of new staff units and their support (31.4% of participants felt they were not well supported and even 27.7% not at all) and a poor availability of specific training tools for COVID-19 patient care procedures.

Hence the need and desire to invest in the logistics system and equipment (52.1%), in the implementation of new staff units (60.3%) and in the provision of effective training tools (34.2%).

Another small amount of support comes from administrative equipment, such as information and IT systems, on which most of the structures would invest more in the future (52.1%) (Tab. II).

As a statistically significance correlation was found between the need of future investments in the Italian NHS, the pre-COVID preparedness and the way how the surveyed professionals felt themselves supported by their healthcare management, respectively ( $p < 0.05$ ), unfortunately no statistical significance emerged from the application of an univariate analysis on the above mentioned variable on the need of future investments ( $p > 0.05$ ) (Tab. III).

Tab. III. Binomial test on future needs.

Binomial test							
	Level	Count	Total	Proportion	p	95% Confidence Interval	
						Lower	Upper
Technological and instrumental equipment (diagnostic equipment, PPE)	y	29	73	0.397	0.101	0.28453	0.519
	n	44	73	0.603	0.101	0.48140	0.715
Administrative equipment (information systems, computer systems, etc.)	y	38	73	0.521	0.815	0.40038	0.639
	n	35	73	0.479	0.815	0.36100	0.600
Management equipment (provision of specific guidelines, organizational tools, etc.)	y	29	73	0.397	0.101	0.28453	0.519
	n	44	73	0.603	0.101	0.48140	0.715
Staffing	y	44	73	0.603	0.101	0.48140	0.715
	n	29	73	0.397	0.101	0.28453	0.519
Logistic equipment (spaces, logistic routes, supply chain, etc.)	y	38	73	0.521	0.815	0.40038	0.639
	n	35	73	0.479	0.815	0.36100	0.600
Training tools	y	25	73	0.342	0.010	0.23532	0.463
	n	48	73	0.658	0.010	0.53717	0.765
Others	y	3	73	0.041	<.001	0.00856	0.115
	n	70	73	0.959	<.001	0.88456	0.991

Nevertheless, the Recovery Plan is still unclear and most of participants are not even aware of the actions and goals expected by the “health” chapter.

Today there is still concern about the planning tools and the implementation of the plan, highlighting the limits of diffusion and the knowledge of both contents and strategies.

A problem of clarity? Lack of references? Or maybe of interest?

Furthermore, concerning with monitoring and assessment, the survey reveals many weaknesses and gaps related to the knowledge of impact assessment tools, proposing to set up independent, rigorous and intellectually honest “watchdogs networks” whose goal is to participate in the support process, including training.

ASIQUAS considers itself the promoter of this activity.

## Discussion

We aimed at understanding the future needs and challenges of our healthcare system, starting with the analysis of healthcare management of the COVID-19 pandemic in Italy after 18 months from the first wave.

Our analysis also aimed at providing decision makers quantitative inputs for improvements, also by evaluating expectations and doubts of the introduction of the Italian Recovery Plan and the post-COVID healthcare planning and management.

To invest in physicians, nurses, and technological innovation to respond to population needs are the most relevant recommendations of the survey. The number of physicians in Italy [16], now similar to other EU nations, is hit by retirement (more than half of doctors are older than 55 years), limits on medical school admissions, and stringent specialisation programme requirements combine to shrink numbers. Nursing has been strained by chronic understaffing for years, with ratios of nurses and midwives to inhabitants only half those observed in Germany [17, 18].

Without providing a solution to this problem, the application of the PNRR is at risk [19].

In fact, investing 2 million in community houses and drawing up staffing plans are not enough to make this a reality; otherwise, if the shortage of personnel is not covered, the risk is to have facilities but not activities and services.

In addition to this, data from 2017 show that Italian nurses are the lowest paid among European industrialized countries.

This arises the necessity for long-term strategies, which consider future epidemiological trends and new health technologies (*e.g.* mobile health) so that health professionals are truly in step with the actual and future needs [17].

The COVID-19 pandemic highlighted many shortcomings that have long been recognized but little considered in resolute terms.

The highly fragmented and non-homogeneous territory has caused considerable variability in terms of response and the most virtuous regions in handling the situation have been those that have implemented the assets already owned [19].

The impact of the pandemic on a weak and not fully prepared system has caused an increased workload which was difficult to manage, exacerbated by tired and psychologically unstable personnel [12, 14].

Infact, the workers involved in the pandemic were exposed to the risk of infection but also to an emotional overload associated with a reduction of useful human resources and, in some cases, organizational precariousness. The vast literature related to the stress of health workers confirms that the health sector is an area full of psycho-social risk factors, mainly linked to working aspects such as organization, safety and health [14, 20].

COVID-19 represented a clear accelerator from a managerial and cultural point of view towards the acceptance of important changes able to reduce the variability of responses and to create a transversal and concerted system of actions throughout the territory.

These changes are now proposed by the Recovery Plan [21], which has allocated \$15.63 billion to health, structuring the mission in two specific components:

- proximity networks, intermediate structures and telemedicine for territorial health care;
- innovation, research and digitalization of the national health service.

The perspective becomes that of an important organizational and technological innovation capable of avoiding fragmentation and miscommunication and strengthening the building blocks of a healthcare organization [22].

The priorities of the recovery plan at the European level are different, as well as the actions on the total resources [23-25].

For example, Spain has focused more attention on health, associating it with 16.5% of the total billion, much more than 8% of Italy [26] (Fig. 1, 2).

Furthermore, Spain is very close to the Italian vision, promoting technologies capable of collecting, processing and verifying useful health information and data, the first through implementing the “Electronic Health Record” and the second through creating sanitary “data lakes.”

The first identified priority in Italy consists in the passage from “taking care of the disease” to “taking care of the person” through the creation of a network on the territory able to bring the health services closer to the citizens and make the response more homogeneous [27].

One of the supporting initiatives has been undertaken by the implementation of a new home care services [28].

The second priority sees the interoperability of data as the core of all reforms, which, thanks to the exploitation of new technologies that are assuming a new role in support of prevention, quality of services and simplification of processes, would represents an

Fig. 1. Italian Recovery and Resilience Plan.

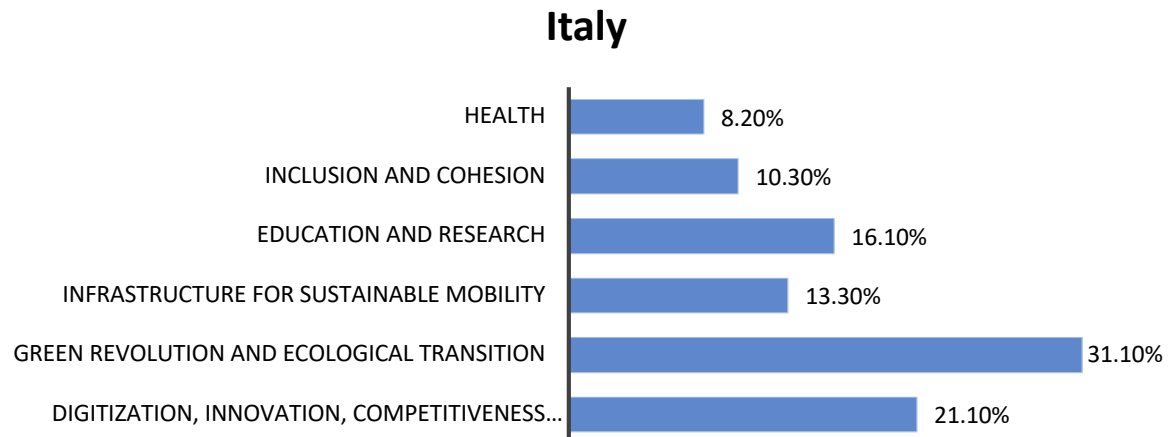
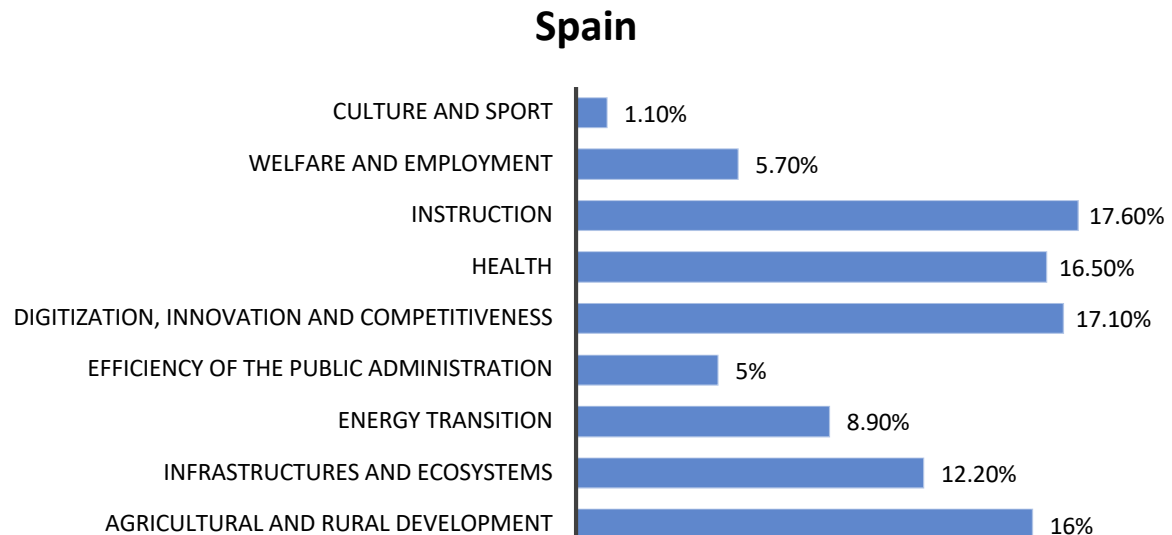


Fig. 2. Spanish Recovery and Resilience Plan.



important tool for the collection, processing and sharing of data and information [29].

Both priorities attempt to address the critical aspects and territorial inequalities, although they find still obstacles and lack of awareness.

In fact, compared to other studies and starting from another survey carried out by ASIQUAS between June and November 2020 [30], the intent of this work is to identify and deepen the needs of a more resilient health system, going beyond the benefits of this ambitious reform and addressing the current skepticism and future issues to be resolved for its real and effective implementation.

Another critical point refers to the primary care, characterized by a similar phenomenon of understaffing; the pandemic highlighted the need of a strong, easily integrated and connected network of general practitioners

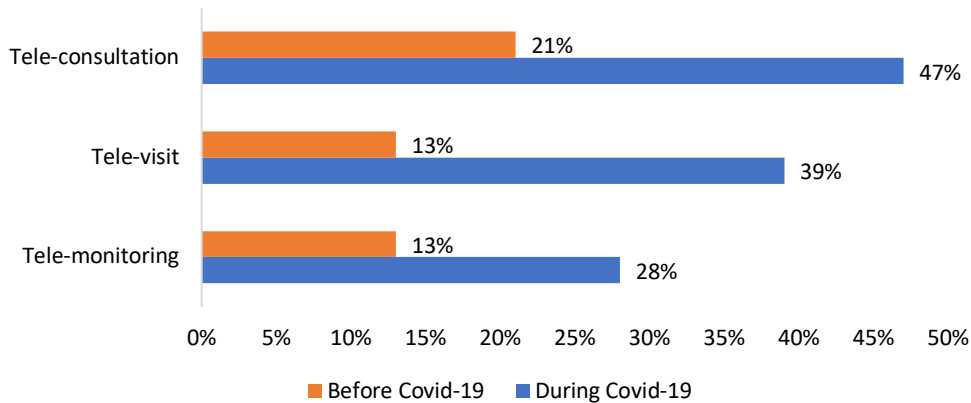
that is lacking today, unlike what happens in some other countries like Denmark.

The Danish healthcare system is considered among the best in terms of qualitative care in Europe mainly because it is strongly based on general practitioners [31] all Danes have 6.9 contacts per year with their GP (in-person, telephone, or E-mail consultation).

Home care and support services for elderly people is highly developed, including home visiting, retirement homes and rehabilitation facilities.

Even before the pandemic, the Danish system focused on primary care and its integration, underlining the importance of a close collaboration among general practitioners in the territory and hospitals

To invest in technological innovation to respond to population needs - the second most relevant recommendations of the survey, matches with the challenge of digital health in Italy. As in many other

**Fig. 3.** The use of telemedicine by doctors.

countries, telemedicine is still scarcely used, despite the rapid change of mind of many doctors and other health professionals (Fig. 3).

The use of digital health technologies, such as mobile health, telemedicine, wearable devices, artificial intelligence, and interoperable information technology, although long suggested to better manage patients with chronic diseases, increased substantially in Italy and elsewhere during the pandemic as in-person contact became inopportune or impossible [17, 32].

Digital health shows great promise as a means to better manage patients with chronic conditions and help them avoid hospital visits and admissions.

Our results confirm the increasing physicians' interest and use of telemedicine tools during the COVID pandemics [33].

These significant data show the rapid change in mindset not only by physicians and specialists, but also by patients who have become increasingly involved in digital services [34].

Although the importance of the priorities identified, there are still several issues to be addressed.

First of all, one of the biggest problems in Italy starts from the interoperability of data, actually organized in silos and dependent on a single department, isolated from others.

The Italian healthcare system, heavily penalized by strong heterogeneity and multimorbidity, requires the presence of data warehouse where data of each patient are integrated.

It seems essential to develop a network of knowledge and support and an uniform system of interoperable models and infrastructures [35].

Another critical issue is about the clinicians' skills and approach towards technological innovations, therefore specific courses are expected to take place.

Then, it has been considered patients' skills and approach to digital services, considering Italy is largely made up by over 65's, most of which cannot use technological devices. On the other side, the benefits of using telemedicine to treat older patients included the reduction of deferred care and travel burdens, the enhancement in communication

and timely care and a general improvement of the efficiency for physicians.

Finally, an ethical element, associated with patients who are increasingly adverse and reluctant to share their data, must be considered.

Therefore, it is important to consider the educational and cultural aspects not only of healthcare professionals but also and especially of patients.

On the other hand, feasibility comes from the right ambition we will have in considering new opportunities and offering the right tools and certainty.

The overall effects would translate into a more flexible, value-based and patient-centered healthcare delivery, along with the cost savings and timeliness and appropriate support of all groups of disease.

Furthermore, we have to consider the significant downsizing and redistribution of the workload for health workers, considering that many applications have alleviated office closures and staffing shortages due to the pandemic [36].

## Limitations

Some limitations should be considered when interpreting our results.

First, our research has been conducted by means of an electronic survey: the low number of respondents, their heterogeneity belonging to different types of health facilities, their different geographical distribution are limiting issues to be considered [37].

Second, we targeted to professionals joining to a quality improvement society, thus arising the risk of a response bias.

Third, in some cases the selected questions are not enough to explore the multifaceted concepts of healthcare organizations, service planning, healthcare investments and their contextualization to the Italian NHS.

Lastly, we didn't cross-checked by a collection of data at the user's level, which could be useful to assess their views or experiences, in order to effectively assess their perspective towards major changes.

## Conclusion

The evaluation of the pandemic over time has highlighted stressful situations, weaknesses and vulnerabilities in hospitals and in the territory.

Therefore, it appears evident to redesign a uniform and effective model of interoperative management through learning and exchange processes among hospitals and territory, enhancing communication campaigns, implementing and investing in innovative digital services. The aim is to put the patient at the center and to predict its needs, supported by a more efficient and effective organization.

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## Conflict of interests

Authors state no conflict of interest.

## Authors' contribution

All authors actively participated in the study design, data analysis, and drafting of the manuscript. Additionally, all authors read and approved the manuscript.

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