

# The contribution of the private healthcare sector during the COVID-19 pandemic: the experience of the Lombardy Region in Northern Italy

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**Keywords:** Private sector; Lombardy; COVID-19; pandemic

**Parole chiave:** Settore privato; Lombardia; COVID-19; pandemia

## Abstract

**Introduction.** In Lombardy, the first European region hit by the COVID-19 pandemic, for decades the regional public healthcare service has followed a mixed delivery model with extensive involvement of private accredited providers. The study aimed at examining the role of the private sector in delivering healthcare services (diagnosis, hospitalization, and vaccination) during the pandemic.

**Study design.** Healthcare system study

**Methods.** We analysed regional healthcare data referring to the period from March 2020 onwards to assess the availability of acute care and intensive care hospital beds, SARS-CoV-2 tests, and COVID-19 vaccinations. We specifically examined healthcare offered by private accredited providers within the region.

**Results.** Of the 12,306 converted beds for COVID-19 treatment, 4,975 (40%) were in accredited private hospitals. Intensive care beds increased by 95%, reaching 1,755, with 484 (28%) in accredited private hospitals. Since the pandemic onset, 28.9 million (62%) of SARS-CoV-2 tests were conducted by private accredited facilities including pharmacies. Private sector actively contributed to the COVID-19 vaccination campaign administering over 2.6 million doses in 2021, enhancing vaccination capacity to its peak.

**Conclusions.** The longstanding relationship between the public and private sectors within the Lombardy regional healthcare service facilitated a rapid increase in hospital bed capacity, the upscaling of SARS-CoV-2 testing capacity, and the achievement of vaccination goals to address the COVID-19 emergency. Therefore, alongside a robust and adequately funded public healthcare service, the private sector serves as an asset to enhance the resilience of healthcare systems, in line with WHO indications.

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## Introduction

Globally, many healthcare systems are based on a mixed delivery model: these often involve the use of public funds to cover health services offered by both public and private providers (1-4).

During the COVID-19 pandemic, even in long-tradition public healthcare systems, the private sector played an important role in providing health services and ensuring the resilience of health systems. Whether the private sector involvement was part of a mature mixed delivery service or a solution to fill a gap in health services, governments needed to engage with the private sector because public providers were not sufficient to respond to the emergency (5).

According to the COVID-19 Health Systems Response Monitor, the WHO European Region observed various types of private sector involvement in the first two years of the pandemic, with most European countries involved. The extent of the private sector involvement was broad: from the supply of needed equipment, such as face mask and ventilators, to the provision of a wide selection of COVID-19 related health services, to research and clinical trials for medicines and vaccines (6). However, the Global Health Security Index, a preparedness and response framework used to assess countries' capacity to respond to public health emergencies, highlighted that only 11% of the 195 countries assessed using this framework have established formal ways to engage the private sector in public health emergency preparedness and response (7).

In this article, we present the experience of Lombardy, a 10 million-inhabitants region in Northern Italy, where a well-established integrated health system was used to implement health services during the pandemic. We believe that the case of Lombardy can be illustrative, as it was the first region in Europe hit by the pandemic in February 2020 (8, 9). In addition, the regional healthcare service for decades has been heavily integrated with private accredited providers, i.e. organisations that have gone through the accreditation process required to provide performances to the National Health Service (NHS), meeting a number of technical and quality requirements (9).

Our work aims to illustrate and analyse the involvement of the private sector in Lombardy that may be useful in shaping future relationships between public and private providers within publicly funded healthcare systems.

## Methods

To assess the availability of acute and intensive care beds, SARS-CoV-2 testing and COVID-19 vaccination, we analysed regional healthcare data covering the period from March 2020 to November 2023. Specifically, we looked at healthcare provided by private accredited providers in the Region. Based on publicly available data on the institutional website of the Italian Ministry of Health, we obtained the number of hospital facilities within the Lombardy healthcare service, classified by type of provider (public or private).

To assess the total availability of acute care and intensive care units (ICU) beds in hospitals during the pandemic, we used data published by the Lombardy Region referring to March 2020. We focused on data covering the first period of the pandemic, when the need for hospital care for COVID-19 patients was at its peak in Lombardy, and an important upscaling of hospital beds was performed within the regional hospital network. Specifically, we compared the number of beds available in hospitals on two different days (13<sup>th</sup> and 30<sup>th</sup> of March). As such data were stratified by provider type, we could separately evaluate the contribution of private accredited facilities to the upscaling of both acute and ICU beds.

From a large regional database reporting all SARS-CoV-2 test performed within the Region by facility, we obtained data on the number of SARS-CoV-2 tests, categorized by provider type (public or private), from the beginning of the pandemic up to the day of data extraction in November 2023. To evaluate the contribution of private facilities we considered tests performed both by private accredited hospitals, private testing hubs and pharmacies out of the total tests performed.

We gathered data on the number of COVID-19 vaccinations administered in 2021 by large private accredited hospitals, pharmacies, and general practitioners (GPs) using different data sources. Information on vaccinations administered by pharmacies and GPs in their practices was obtained from a 2021 regional database. In addition, we used data on vaccinations administered in vaccination centres run by GPs associations gathering GPs working as freelancers – outside their activity for NHS (unpublished data provided by FIMMG). To collect information from private accredited hospitals, we directly aggregated data provided by facilities within the main private healthcare groups in Lombardy and the Association of Private

Table 1. COVID-19 acute care hospital beds on the 30th of March 2020 in Lombardy

	Private accredited hospitals (n. 69; 45%)	Public hospitals (n. 83; 55%)	Total (n. 152; 100%)
Acute care beds n. (%)	4,975 (40.4)	7,331 (59.6)	12,306 (100.0)
ICU beds n. (%)	484 (27.6)	1,271 (72.4)	1,755 (100.0)
Total beds for COVID-19 patients n. (%)	5,459 (38.8)	8,602 (61.2)	14,061 (100.0)

Hospitals (AIOP), as there was no regional database (unpublished data).

## Results

### Hospital care

At the outbreak of the pandemic, based on data referred to the 13<sup>th</sup> of March 2020, the regional hospital network had 30,208 active beds: 29,308 acute care beds and 900 ICU beds. Private providers accounted for 29% (8,620 out of 30,208) of acute care beds and 30% (270 out of 900) of ICU beds.

By the 30<sup>th</sup> of March 2020, in three weeks' time, the regional hospital network had been rapidly reorganised to cope with the initial surge of COVID-19 cases requiring hospitalisation, including intensive care. Some existing acute care beds within the hospital network were converted to COVID-19 care and new beds were made available. As shown in Table 1, a total of 12,306 acute beds were dedicated to COVID-19 care, with private institutions contributing with 4,975 (40.4%) acute beds. The number of intensive care beds increased significantly from 900 to 1,755 (95% increase), most of which were dedicated to COVID-19 intensive care. Private providers accounted for 484 (27.6%) of the new ICU beds, increasing their capacity from 270 to 484 (79% increase).

Overall, in 2020, a total of 21,903 patients were hospitalised in private accredited hospitals (23.8%) with a death rate of 24.5% with large variation by age groups (10).

### SARS-CoV-2 testing

As shown in Table 2, of the 46.9 million SARS-CoV-2 tests delivered in Lombardy since the beginning of the pandemic, 28.9 million (61.8%) were performed by private providers. Among these, pharmacies made the largest contribution with 20.1 million (42.9%) tests.

### Vaccination rollout

Private sector's contribution to the COVID-19 vaccination rollout in 2021, when the vaccination campaign was at its peak, is detailed in Table 3. Private facilities – which had never been previously involved in such preventive activities – actively contributed to the rollout of COVID-19 vaccinations by establishing large hubs and vaccination centres within hospitals and by providing personnel for vaccination. Notably, the vaccination hub located in Novegro (Milan) involved almost 250 medical residents and junior doctors working with private healthcare providers increasing the medical staff available for vaccination activities (11, 12). GPs contributed to the vaccination roll-out by administering doses in their practices (53,222 doses), but also by working as freelancers – outside their activity for NHS – in vaccinations hubs (1,009,210 doses). Their role in the administration of vaccines in the adult and elderly population, in Lombardy and Italy, was already largely consolidated and therefore positively welcomed by the system during the emergency (13). Subsequently, pharmacies became vaccination sites for the first time in August 2021, providing widespread accessibility. Overall private sector contribution accounts for 13.3% (2,606,666 out

Table 2. Cumulative number of SARS-CoV-2 tests since the beginning of the pandemic in Lombardy by type of provider (updated to the 10th of November 2023)

Provider type	N. of SARS-CoV-2 tests	%
<b>Public</b>	17,931,690	38.2
<b>All private facilities</b>	28,969,353	61.8
Pharmacies*	20,133,027	42.9
Other private facilities (hospitals, testing hubs)	8,836,326	18.8
<b>TOTAL</b>	46,901,043	100.0

\*of these, 6.8% performed by publicly owned pharmacies operating as private entities, outside the NHS

Table 3. COVID-19 vaccinations administered in 2021 by private providers

Provider type	n. doses
Private hospital facilities	1,438,162
General Practitioners*	1,062,432
Pharmacies (only booster doses)	106,072
TOTAL	2,606,666

\* during private activities

of 19,541,241) of the total COVID-19 administrations in 2021 in Lombardy (Table 3).

## Discussion

During the initial surge of the COVID-19 outbreak in the Lombardy Region, private hospitals provided 40% of acute care beds and, in collaboration with the public sector, contributed to the important upscale of ICU beds, providing almost 28% of the total. Private healthcare, mainly through pharmacies, performed more than 60% of SARS-CoV-2 tests. Private sector actively participated also in the vaccination effort, administering over 2.6 million doses at peak periods (2021) through large hubs and hospital centres. Notably, pharmacies became vaccination sites in late 2021, ensuring widespread accessibility for the first time.

Our data show that the efficient mobilization of the private sector hospital beds during the initial surge of COVID-19 cases and the reorganization efforts throughout the pandemic, heavily relied on the well-established private component of the regional health system, as most private providers agreed to offer hospital beds and ICUs in a joint effort with public facilities to respond to the health emergency (14, 15). Moreover, it focused on the Region's existing health service assets, i.e. the highly developed and specialised hospital network. In this context, the political capacity to work with private sector partners that had been built up over the years was a resource that decision-makers could readily draw on to respond to the surge of hospitalizations during the pandemic.

Public-private collaboration played a key role in maintaining high-quality healthcare under challenging conditions. Despite a significant reduction in overall hospital admissions in 2020, Lombardy showed a remarkable recovery in 2021, outperforming the national average. In particular, the private sector

in Lombardy showed a remarkable recovery rate of 9.3%. Consistently positive clinical outcomes were observed, particularly in private accredited hospitals. This underlines the Region's adaptability and unwavering commitment to maintaining high standards of healthcare. (16).

Focusing on preventive measures, our data show that the private sector played a key role in upscaling SARS-CoV-2 testing capacity, with most of the tests performed in pharmacies, and offered an example of how the private sector may provide infrastructure and valuable support to the health workforce for the COVID-19 immunization campaign. The involvement of the private sector in vaccine delivery in Lombardy was instrumental in achieving the objectives of the campaign, increasing the overall vaccine delivery capacity of the region, improving accessibility, and ensuring widespread immunisation against COVID-19 (13,14). Lombardy was the first region in Italy, and the third in Europe, to introduce pharmacy-based vaccination on a large scale. This achievement was made possible by the implementation of specific legislation and the adoption of standardised procedures in March 2021 (17). In 2022, the formal integration of pharmacists administering COVID-19 and flu vaccines in the system became an established practice within the whole Italian healthcare service (18). This integration yielded relevant results, with 45% of the anti-COVID vaccine and 15% of the influenza vaccine administered in the first 6 weeks of the 2023 autumn campaign. The capillarity of pharmacies on the territory made them suitable as support structures for vaccination campaigns in the adult, the elderly, and the frail population. This example also served to demonstrate the alignment of structures to deliver a policy strategy and highlighted the value that private sector entities can bring to meeting health needs.

The private sector's involvement boosted capacity at key points when public facilities and services alone could not cope with the emergency. The data presented in our work illustrated the value of policy capacity, underpinned by good governance, to support the successful deployment of private sector resources in line with the policy objectives of public partners. From a governance perspective, Lombardy's ability to capitalise on the established relationships and institutionalised contracting model of private accredited providers within the hospital network, particularly at the onset of the pandemic emergency, serves as an example of aligned structures and capacity to implement high-priority policies and operational goals along with private sector partners (19).



Learning from the experience of the COVID-19 pandemic is particularly important as it is likely that health systems will continue to work with private sector providers for several reasons. First, they may have had positive experiences during the pandemic when different ways of working with external partners provided viable alternatives to achieve specific goals or generate novel solutions to problems (20). Moreover, in the post-pandemic period, engagement with the private sector may be a possible mean to address the increasing demand for healthcare services and reduce the waiting times for access to health services and procedures (21). This collaboration is also essential to meet the needs of healthcare systems and ensure Universal Health Coverage, a goal consistently advocated by the World Health Organization (22).

## Limitations

The main limitation of the study was the lack of comprehensive data on vaccinations provided by private accredited hospitals. We gathered aggregated “grey” data directly from major private healthcare groups and associations, but these data may not be exhaustive or, conversely, there could be some cases of data overlapping. Additionally, the data provided by different facilities refer to slightly different periods, making it difficult to compare the private sector’s vaccination effort with the overall regional vaccination effort.

## Conclusions

The sustained collaboration between the public and private sectors in the Lombardy regional healthcare service was instrumental in rapidly expanding bed capacity to meet the needs of the emergency, scaling up SARS-CoV-2 testing capacity and successfully meeting vaccination campaign targets to ensure widespread immunization against COVID-19. The pandemic underscored the valuable contribution of private sector engagement, particularly when combined with effective governance, to achieving health system goals. In this way, the private sector proved to be an asset in strengthening the resilience of the health systems alongside a robust and well-funded public health service. Since health systems are likely to continue to draw on private sector capacity, we think that the pandemic experience in Lombardy provides a valuable example for future private sector engagements and can be instructive in providing

guidance on how the private sector may be engaged effectively in the future.

## Riassunto

### *Il contributo del settore sanitario privato durante la pandemia: l'esperienza della Lombardia.*

**Introduzione.** In Lombardia, prima regione Europea colpita dalla pandemia, il sistema sanitario si basa da decenni su un modello misto che coinvolge in modo rilevante le strutture private accreditate. Lo studio ha l’obiettivo di esaminare il coinvolgimento del settore privato nella fornitura di servizi sanitari di diagnosi, cura e prevenzione vaccinale durante la pandemia.

**Disegno dello studio.** Studio sui servizi sanitari.

**Metodi.** Abbiamo analizzato i dati sanitari regionali relativi al periodo da marzo 2020 in poi per valutare la disponibilità di posti letto per acuti e di terapia intensiva, i test per il SARS-CoV-2 e le vaccinazioni anti-COVID-19. Abbiamo esaminato in modo specifico l’assistenza sanitaria fornita dai fornitori privati accreditati nella regione.

**Risultati.** Dei 12.306 letti convertiti per il trattamento del COVID-19, 4.975 (40%) erano in ospedali privati accreditati. I letti di terapia intensiva sono aumentati del 95%, raggiungendo quota 1.755, di cui 484 (28%) in ospedali privati accreditati. Dal momento dell’inizio della pandemia, 28,9 milioni (62%) di test per il SARS-CoV-2 sono stati effettuati da strutture private accreditate o farmacie. Le strutture e i professionisti privati hanno contribuito attivamente alla campagna di vaccinazione anti-COVID-19, con quasi 2,6 milioni di dosi, portando la capacità di vaccinazione al suo apice.

**Conclusioni.** La collaborazione di lunga data tra il settore pubblico e privato all’interno del sistema sanitario regionale lombardo ha facilitato un rapido aumento dei posti letto ospedalieri, della capacità diagnostica per il SARS-CoV-2 e il raggiungimento degli obiettivi di vaccinazione per affrontare l’emergenza COVID-19. Pertanto, insieme a un sistema sanitario pubblico robusto e adeguatamente finanziato, il settore privato rappresenta un vantaggio per potenziare la resilienza dei sistemi sanitari, in linea con le indicazioni dell’OMS.

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