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Managing two waves of the COVID-19 pandemic in northern emergency departments in Paris: COVIDORG II

Gestion de deux vagues de la pandémie de COVID-19 dans les services d’urgence du nord de Paris : COVIDORG II

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Received 19 February 2022; accepted 30 August 2022
Available online 1 September 2022

KEYWORDS
COVID-19; Emergency services; Burnout; Caregivers; Full-time equivalent; Arduousness

Summary
Context. — At the end of the 1st lockdown, we thought the COVID-19 pandemic was over. Yet, we had to deal with other successive waves.
Objective. — To analyze our strategies for managing the 2nd and 3rd waves of the COVID-19 pandemic.
Methods. — Descriptive and observational study in two emergency departments in the North of Paris (Bichat and Lariboisière hospitals) over the period from May 01, 2020, to May 31, 2021.
Results. — Analysis of our activity during the study period revealed that less than 5% of patients treated for COVID-19 pneumonia in our 2 hospitals had died. Two explanations for this observation: on the one hand, a better knowledge of the physiological mechanisms of the disease; And on the other hand, a weapon to effectively prevent severe forms, hospitalizations, and deaths: the vaccine. Yet, 1 year after the pandemic, we continued to see sustained activity.

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https://doi.org/10.1016/j.jeurea.2022.08.004
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Introduction

At the end of the first wave of the COVID-19 pandemic, we had a feeling of national pride, shared by the entire scientific medical community but also by most of the French population. Of course, we were exhausted, but happy to have been able to face a historic health crisis. Strong in our certainties, we kept the hope of being able to find an "almost" normal life; with the fear of having to face a new wave of the pandemic.

To give us some background, the first lockdown ended in May 2020; then we found ourselves in the middle of summer. It was during this period that we began to observe a generalized relaxation in compliance with barrier measures. This had led to the observation from August 2020 of a second wave of the COVID-19 pandemic. As of August 28, 2020, for example, 7231 new cases of COVID-19 infections had been reported in France. This wave had continued during the autumn; so that on November 7, 2020, the number of new cases reported reached a peak of 86,598 contamination. The management of this wave had led the government to establish a second national lockdown from October 30 to December 15, 2020.

This second wave prompted us to renew the organizational strategy that we had used in the past [1]; namely the distinction of COVID and no-COVID zones within our services; but also, within our hospitals. During this period, we received the results of the RECOVERY trial [2], which validated the use of corticosteroid therapy in patients hospitalized for COVID-19 and on oxygen therapy. This trial was able to demonstrate that the use of dexamethasone at a dose of 6 mg per day in intravenously for five to ten days significantly reduced the mortality of these patients.

Another determining point in the management of patients hospitalized for COVID-19 pneumonia was a non-negligible prevalence of thromboembolic complications. A study published in April 2020 by F. Grillet [3] and carried out at the Besançon university hospital center estimated the prevalence of pulmonary embolism in these patients at 23%. This observation had led us on the one hand to systematically look for this complication in patients with a very high oxygen dependence (≥ 6 L/minute); and on the other hand, to administer anticoagulant treatment at least in preventive doses to all our hospitalized patients [4].

As of December 2020, conclusive trials on the effectiveness of vaccination against COVID-19 have been published. Two types of COVID-19 vaccines had been developed: initially messenger RNA vaccines (Pfizer and Moderna); then viral vector vaccines (AstraZeneca and Janssen/Johnson & Johnson). The results of these different

partly related to COVID-19, but also for other consultation reasons. And unlike the first wave, the number of caregivers has been significantly reduced due to exhaustion. It is also important to highlight the psychological impact of COVID-19 with a number of suicide attempts doubling during our study period.

Conclusion. — The COVID-19 pandemic has weakened the buildings of our health care system. Today, the burden of emergency care rests on a limited number of professionals.

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trials showed that the vaccines were effective in preventing symptomatic COVID-19 infections; severe forms; and deaths [5–8].

A conditional marketing authorization had been obtained for all these vaccines and the vaccination campaign had started in France on December 27, 2020. It was carried out gradually, since it started with patients older, or younger but with comorbidities; it also targeted very early on caregivers exposed to the risk of contamination by COVID-19; before eventually spreading to the rest of the general population.

Unfortunately, this vaccination campaign was slow to take hold on our territory, not only because of skepticism towards this new drug; but also because of the circulation of a new variant in France from December 2020: the English or alpha variant. The study by Roquebert et al. [9] estimated that as of March 12, 2021, 85% of COVID-19 infections were caused by this variant in France.

The study by Monel et al. [10] was carried out using 426 nasopharyngeal samples infected with SARS-CoV-2 and collected from October 2020 to May 2021. The authors observed that the period of infectivity by this variant was characterized by a low ct value (significant viral excretion), reliable detection by antigenic tests (positive on 94% of infected samples), rapid onset of symptoms within 2 days following contamination, and absence of immunoglobulins G and A. This study also reports that the infection with the alpha variant was characterized by a rapid viral decrease over time and an important production of cytokines.

This is how we have seen a third wave of the COVID-19 pandemic emerge. This wave was more predictable as we had again observed a relaxation of the barrier measures during the end-of-year celebrations; and the second lockdown installed a few months earlier had not been restrictive enough to curb the spread of the virus.

This 3rd wave had therefore started in mid-March 2021 and had extended until the end of May 2021. The epidemic had started to rise again with a peak on April 11, 2021, with 117,900 cases of contamination for COVID-19. A third national lockdown had thus been introduced from April 3 to May 3, 2021, to limit the spread of this pandemic.

Our objective in this study is to analyze our management strategies for the 2nd and 3rd waves of the COVID-19 pandemic.

### Materials and methods

Our study is a descriptive and observational study in two hospitals in the North of Paris: Bichat and Lariboisière. It specifically targets the period from May 01, 2020, to May 31, 2021.

It focused on analysing our activity during these times: measuring the impact of our organizational strategy on the occurrence of nosocomial infections; the rationalization of our care strategies, whether for carrying out additional examinations, but also for prescribing treatments in the context of COVID-19; justification of government vaccine propaganda against COVID-19 with specific studies; and analyzing the flow of psychiatric patients to determine whether the pandemic has contributed to a discontinuation of care.

| Table 1 | Destinations services after emergency department. |
|----------|---------------------------------------------------|
| Service 1 (n = 1021) | Number of days | % |
| Services | | |
| Emergency hospitalization unit | 946 | 92.6 |
| Medical and toxicological resuscitation | 27 | 2.6 |
| Internal medicine | 17 | 1.7 |
| Surgical resuscitation | 8 | 0.8 |
| Infectious disease | 6 | 0.6 |
| Cardiology | 8 | 0.8 |
| Other continuing care units | 5 | 0.5 |
| Endocrinology | 4 | 0.4 |
| Intensive and critical care units subtotal | 40 | 3.9 |
| Conventional hospitalization units subtotal | 35 | 3.4 |
| Total | 1021 | 100 |

### Results

The sources used to summarize the activity are not of the same nature. For Lariboisière, we used data from the Urquel software (MainCare Manufacturer) and those provided by the hygiene department. For Bichat, we used data from the medical information center.

### Summary of COVID-19 activity, Urquel source

During the period from May 01, 2020, to May 31, 2021, 1773 patients admitted to the emergency room of Lariboisière Hospital for COVID-19; 1021 (57.6%) were hospitalized; and 752 (42.4%) went directly home.

Of the 1021 patients hospitalized after their visit to the emergency room, 946 (92.6%) were admitted to the emergency hospitalization unit; 40 (3.9%) were hospitalized in critical care unit; and 35 (3.4%) were hospitalized in conventional care unit, except emergencies (Table 1).

Of the 946 patients admitted to the emergency hospitalization unit, 5 (0.5%) died within this unit, 305 (32.2%) were transferred outside the hospital, 115 (12.2%) returned home, 75 (8%) were admitted to intensive care unit and 446 (47.1%) were hospitalized in conventional care unit (Table 2).

### Summary COVID-19 activity, hygiene source

This synthesis was carried out from the results of reverse transcriptase polymerase chain reaction (RT-PCR) held by the hygiene service of Lariboisière hospital. During the period from May 04, 2020, to May 31, 2021, 1636 patients had tested positive for COVID-19. Among them, 635 (40%) remained hospitalized in conventional care unit, 54 (3%) were transferred to critical care unit, 894 (54%) received ambulatory care and 53 (3%) died (Fig. 1).
patients were hospitalized in conventional care unit for COVID-19; 449 (6.23%) were admitted to critical care unit, 1911 (26.5%) discharged home; and 410 (3.4%) died (Fig. 2).

Feasibility of distinct hospitalizations for COVID and no-COVID patients

In subsequent waves, we were able to repeat the organizational strategy we used in the first wave: namely the distinction of COVID and no-COVID zones within our emergencies; but also, within the hospital [1]. In each of our sectors of activity, we kept specific boxes for the isolation of patients with or suspected of having a COVID-19 infection. And in front of each of these boxes, were stored trolleys containing the essential elements for the protection of health professionals, namely FFP2 masks, caps, gloves, gowns, visors, or protective glasses.

Nosocomial COVID among care givers

Recall that the objective of our strategy was to limit nosocomial COVID-19 cases; in other words, contamination by COVID-19 within the hospital environment. To give a clearer definition: “Nosocomial COVID is a COVID-19 infection acquired in a healthcare setting. It concerns both patients and caregivers. For the patient, the contamination can be done by another patient or a caregiver during a passage or a stay in the hospital. For the caregiver, the contamination can be done by a patient or by another caregiver”.

To access this information, we contacted the occupational medicine services. Unfortunately, these services did not have clear statistics on this subject. Caregivers

### Table 2 Destinations services after emergency hospitalization units.

| Service (n = 946) | Number of days | %  |
|-------------------|----------------|----|
| Death             | 5              | 0.5|
| Transfer          | 305             | 32.2|
| Return home       | 115             | 12.2|
| Mutations         | 521             | 55.0|
| Internal medicine | 221             | 23.4|
| Infectious disease| 123             | 13.0|
| Endocrinology     | 90              | 9.5 |
| Medical and toxicological | 46 | 4.9 |
| Surgical resuscitation | 21 | 2.2 |
| Other continuing care units | 8 | 0.8 |
| Geriatrics        | 7               | 0.7 |
| Digestive surgery | 2               | 0.2 |
| Rheumatology      | 1               | 0.1 |
| Cardiology        | 2               | 0.2 |
| Intensive and critical care units subtotal | 75 | 8 |
| Conventional hospitalization units subtotal | 446 | 47.1 |
| Total             | 946             | 100|

Summary of COVID-19 activity, source of medical information department

This summary was produced using information provided by the Medical Information Department of Bichat Hospital. Over the period from May 04, 2020, to June 06, 2021, 4532 (63%)
contracting COVID-19 consulted their attending physician and not the occupational physician.

A procedure existed so that caregivers wishing to be tested at the hospital could anonymize their results. Unfortunately, this procedure was also not necessarily followed because the caregivers were tested by the "patient" sector.

We also tried to trace this information by measuring short-term work stoppages over the period. Indeed, at that time, any caregiver contracting COVID-19 was required to be placed on sick leave seven to ten days after the onset of the first symptoms. Even with this route, it was very difficult for us to be able to trace the cases of COVID-19 contracted by caregivers, because on the one hand we were faced with medical secrecy (the caregiver could refuse to respond to our request); and on the other hand, all the one-week sick leaves were not necessarily related to COVID-19.

The same is true for patients where it was impossible for us to differentiate nosocomial COVID-19 cases from community COVID-19 cases. In our emergencies, we had a hospitalization unit divided into two wings with about twenty beds in total. To limit the risk of contamination, patients with COVID-19 not only stayed in single rooms; but also, in a different hospitalization unit than patients without COVID-19. Most patients remained hospitalized for a short duration, which varied between 24 and 48 hours; thus, there was little chance that they would be tested twice to detect a COVID-19 disease acquired during hospitalization.

**Patient management strategy**

**Screening strategy**

Our functional adaptation capacities have evolved a lot compared to the first wave. We have significantly increased our ability to test patients presenting to the emergency room with COVID-19. We were testing all symptomatic patients; as well as asymptomatic patients requiring hospitalization. We therefore had at our disposal in our emergency services a machine capable of giving RT-PCR results in 15 minutes. All the results were sent directly to the laboratories of our various hospitals.

We also carried out serological tests for all caregivers wishing to know whether they had been infected with the SARS-CoV-2 virus.

Asymptomatic patients not requiring hospitalization were not tested in the emergency room. They were sent home with instructions to perform home self-tests; or RT-PCR in city laboratories. Self-tests, in other words antigen tests, were based on the rapid detection of the specific antigen of SARS-CoV-2. The advantages of these tests were: their ease of use and the speed of obtaining results (about 15 minutes). But their main drawback was lower sensitivity compared to RT-PCR, with the risk of false negatives. Which leads to repeat them in case of negativity or to directly perform RT-PCR [11].

**Strategy for prescribing additional examinations**

Our strategy concern additional examinations in patients with suspected or confirmed SARS-CoV-2 pneumonia is described on Table 3.

The performance of additional examinations was mainly based on the presence of clinical severity criteria (respiratory rate ≥ 30/minute, pulsed oxygen saturation < 90% in ambient air or $O_2 ≥ 6$ L/minute to get a pulsed oxygen saturation > 96%, cardiac frequency > 120/minute, systolic blood pressure < 90 mmHg ± marbling), and on the presence of comorbidities [12–18].
D-dimer threshold
We acknowledge that some studies have recommended changing the threshold for interpreting D-dimer in patients with COVID-19 pneumonia [19]. The study by Mouhat et al. [20] for example had proposed a threshold for carrying out chest CT angiography for D-dimer > 2590 ng/mL. This threshold made it possible to diagnose pulmonary embolism in patients with COVID-19 pneumonia with a sensitivity of 83.3% (95% CI: 68.6–93%), a specificity of 83.8% (95% CI: 73.8–91.1%), which corresponded to a positive predictive value of 72.9% (95% CI: 61.7–81.8%) and a negative predictive value of 90.5% (95% CI: 82.9–95%).

Daniël A. Korevaar [21] will later post a comment on this article [20] saying that D-dimer threshold chosen should have been the one that gave a predictive value close to 100%; and not the one that maximized Youden’s index which corresponds to the sum of sensitivity + specificity. Using D-dimer cutoff at 2590 ng/mL, 17% of cases of pulmonary embolism were missed; therefore, the use of this threshold had no clinical relevance. Thus, we kept the usual D-dimer positivity threshold (500 ng/mL for patient aged < 50 years or age in years × 10 ng/mL for patient aged ≥ 50 years).

Table 3 Prescribing for additional examinations.

| Mild COVID-19 pneumonia | Moderate to severe COVID-19 pneumonia |
|-------------------------|--------------------------------------|
| No diagnostic test in emergency room | Performing RT-PCR |
| No biological examination in emergency room | Blood test |
| | Blood cell count |
| | C-reactive protein or procalcitonin |
| | Troponin |
| | Brain natriuretic peptid |
| | D-dimer |
| | Ionogram, urea, creatinine |
| | Liver function test |
| | LDH |
| | CPK |
| | Arterial blood gas |
| | Arterial lactate |
| | Imaging assessment |
| | Chest scanner not injected if D-dimer negative |
| | Spiral thoracic computed tomographic angiography if D-dimer positive |

About hydroxychloroquine and azithromycin
We had enough scientific resources not to encourage the prescription of hydroxychloroquine [25,26] or azithromycin [27] in our emergency departments.

Table 4 Patients hospitalized for confirmed COVID-19 pneumonia in conventional unit.

| Therapeutic strategy | Directives for use |
|----------------------|--------------------|
| Oxygen | If saturation < 95% (target oxygen saturation between 88—92% in COPD) |
| | Between 1 L to 5 L: oxygen goggles |
| | Between 6 L to 15 L: high-concentration mask oxygen therapy with reservoir |
| Nasal high flow oxygen therapy or C-PAP [22] | Persistent hypoxia despite high-concentration mask oxygen therapy |
| Non-invasive ventilation [22] | Absence of hypercapnia |
| | Hypercapnic respiratory acidosis |
| Dexamethasone [2] | Signs of acute respiratory distress |
| | 6 mg per day intravenously for 5 or 10 days |
| Anticoagulation [3,4] | If oxygen therapy ≥ 3 L |
| | Preventive anticoagulation of all patients |
| | Curative anticoagulation if confirmed thromboembolic complication |
| Tocilizumab [24] | 8 mg/kg intravenously |
| | In moderate to severe forms of COVID-19 pneumonia |
| | In association with dexamethasone |

The vaccination campaign in France
A summary of the 4 vaccines authorized in France is provided on Table 5.

The COVID-19 vaccination campaign began in France on December 27, 2020. The High Authority of Health had planned a vaccination strategy in several progressive phases, according to two prioritization criteria: the existence of an individual risk of developing a severe form of the disease and increased exposure to the virus. The goal was to reach fifteen million people vaccinated by the summer of 2021.

Given that the number of vaccine doses initially available was limited, it was recommended that the initial focus should be on the vulnerable: namely, residents of institutions for dependent elderly people because they accounted for almost one third of deaths at the time; as well as caregivers in contact with these people at risk.

Once the number of vaccine doses was sufficient, vaccination against COVID-19 could be extended to people over the age of 75 or aged 65 to 74 but with comorbidities. This second phase of vaccination, which began on 4 January
2021, also targeted professionals at risk of severe forms, i.e. those who were over 50 years of age or younger but who had comorbidities.

The third phase of COVID-19 vaccination began on February 25, 2021. During this phase, and due to the ease of vaccine supply, people aged 50 years or younger but with comorbidities were able to benefit from the vaccine. It was also during this phase that vaccination was extended to the rest of the caregivers; as well as other priority occupations such as education and security.

The fourth phase of COVID-19 vaccination began on April 12, 2021 and targeted a younger audience without comorbidities; but with an increased risk of being exposed to the virus: vulnerable and precarious people (homeless, etc.), living in communities (prisons, psychiatric institutions, homes, etc.), professionals caring for vulnerable people, including social workers, people living in confined housing or even working in closed places promoting the acquisition of infection (construction workers, slaughterhouses, etc.).

The final step in this strategy was to vaccinate all people over the age of 18. This was possible from 31 May 2021. Vaccination against COVID-19 had finally been opened to 12–17-year-olds after the agreement of both parents and consent of the teenager from 15 June 2021.

### Table 5 COVID vaccines authorized in France.

| Vaccines (laboratory) | Doses | Efficacy against COVID-19 | Authorized in France |
|-----------------------|-------|--------------------------|----------------------|
| BNT162b2 (Pfizer-BioNTech) [6] mRNA-1273 (Moderna) [5] | 2 doses spaced at least 21 days apart 2 doses spaced at least 28 days apart | 95% [95% CI: 90%−97.9%] for preventing symptomatic infections 94.1% [95% CI: 89.3%−96.8%]; \( P < 0.001 \) to prevent symptomatic infections; 100% to prevent serious forms | December 21, 2020 |
| ChAdOx1-S/nCoV-19 (AstraZeneca) [7] Ad26.Cov2.S (Janssen/Johnson&Johnson) [8] | 2 doses spaced 4 and 12 weeks apart 1 single dose | 70.4% [95% CI: 54.8%−80.6%] for preventing symptomatic infections 66.1% (66 versus 193 cases, 95% CI: 55−74.9) to prevent moderate to severe forms 85.4% [95% CI: 54.2−96.9] to prevent severe to critical forms | January 6, 2021 January 29, 2021 March 11, 2021 |

A psychiatric wave after lockdown?

### A psychiatric emergency area

Usually, we take care of patients consulting for psychiatric reasons in the emergency room. Thus, a circuit is specifically dedicated to the charge of these patients with a psychiatrist present 24 hours a day in our services.

There are schematically two categories of patients: those who have no known psychiatric history and who have a first psychiatric episode; those who decompensate a known psychiatric pathology.

For the first category, initial management is carried out by the emergency physician who carries out a clinical evaluation; as well as the prescription of additional examinations if deemed necessary. When the results of the examinations are normal, the patient is referred to psychiatry for further care.

For the second category, the initial phase of care is the direct responsibility of the psychiatrist present in the emergency room.

Regardless of the category of patients to be treated, it will always be a question of quickly determining whether the patient is being treated on an outpatient basis or whether he or she should be hospitalized. If the patient refuses to be hospitalized, the psychiatrist may decide to initiate psychiatric care under duress.

Since the beginning of the COVID-19 pandemic, we have wanted to maintain a consultation offer dedicated to these patients. Despite periods of confinement during successive waves, we have never interrupted the activity of psychiatric emergencies.

### An average number of consultations stable over a period of 2 years

Over the period from 1 January 2020 to 30 November 2021, the average number of requests for psychiatric advice was 265 per month at the Lariboisière emergency department. Over the period from January 1, 2020, to December 31, 2021, it was an average of 268 per month in the Bichat emergency department. As shown in Figs. 3 and 4, the number of consultations for psychiatric counselling remained stable over a 2-year period.

The reasons for the consultation during this pandemic were very varied: anxiety attack, post-traumatic stress disorder, major depressive episode with suicidal thoughts, acute delirium, decompensation of schizophrenia or bipolar disorder, acute agitation on the consumption of toxic substances (alcohol, other drugs, etc.).

### An increase in the number of suicides attempts since the COVID-19 pandemic

We observed that the number of adult consultants for suicide attempts increased from 20 to 40 between January 2020 and January 2021; to end up being above 50 in December 2021 (Fig. 5).

This shows that COVID-19 has not only caused physical but also psychological consequences on our patients [28].
Some reasons to explain it: the isolation caused by the recurrent containment measures, the difficulties of access to psychiatric follow-up in consultation (care considered non-urgent in times of health crisis), the fear of contracting the SARS-CoV-2 virus or even dying of the disease, the upheaval of the world of work with the rise of teleworking, the situations of financial precariousness caused by a loss of job...

Similar observations have been reported in the child psychiatry department of Robert Debré Hospital where the number of suicides attempts among children aged 15 or younger is estimated to have increased...
from 7.8 in March/April 2020 to 48.7 in March/April 2021 [29].

**Discussion**

The result of our analysis shows that we are able during the 2nd and 3rd waves of COVID to implement in our 2 major emergency room hospitals an effective patient care strategy, integrating scientific evolution on the understanding and treatment of pandemics. However, we observed a major difference between these 2 waves and a degradation related to the staff of our services. It was characterized by the mismatch between emergency room attendance and the number of caregivers for patients. Indeed, the following lockdowns had not led to a decrease in emergency room attendance. We had returned to an average of 240 passages per day. And we took care of all the patients who consulted; whether for COVID reasons or not. Yet, as this health crisis continued, the number of caregivers working in our services was significantly reduced. This led to the discussion of the following points:

**The shortage of medical and non-medical personnel**

The emergency services of Bichat and Lariboisière are among the largest emergency services in Paris; with an estimated number of passages between 80,000 and 90,000 per year. They are mainly composed of an emergency reception service (ERS); and a short-term hospitalization unit (STHU) with twenty-four beds. Lariboisière emergency department also has an EMS mobile intensive care unit (MICU) station based in hospital. Bichat emergency department are attached to EMS-MICU of Beaujon hospital in the Hauts-de-Seine department; but their operation is very distinct.

According to the recommendations of the SAMU-Urgences de France, the number of senior doctors needed for the ERS would be 27.6 full-time equivalents (FTEs); for the STHU with twenty-four beds of 4.8 FTEs. And for an urban EMS-MICU like Lariboisière that makes about 2600 interventions per year: 12 additional FTEs [30].

If we then focus on the non-medical workforce, for emergency services that make between 85,000 and 95,000 passages per year, according to the recommendations of the SAMU-Urgences de France: it would take 99 FTEs graduate nurses and 87 FTEs nursing assistants for the operation of the ERS. And for the operation of the STHU, additional FTEs namely: 6 FTEs graduate nurses and 6 FTEs nursing assistants for 8 beds [30].

Currently (i.e., 2 years after the COVID-19 pandemic), the Lariboisière emergency departments have 22 FTEs senior doctors for the operation of the ERS, STHU and EMS-MICU; which corresponds to a deficit of half of the FTEs necessary for our optimal functioning. On the Bichat emergency side, the situation seems identical with currently 18 FTEs senior doctors for the operation of the ERS and STHU; this corresponds to a deficit of 14.4 FTEs for the optimal operation of emergencies.

In terms of non-medical staff, the Lariboisière emergency service (ERS + STHU) currently has 39.4 FTEs graduate nurses working during the day; and 34.98 FTEs graduate nurses working at night; That’s a total of 74.38 FTEs graduate nurses, i.e. deficit of 24.62 FTEs graduate nurses for optimal functioning. On the side of the nursing assistants currently in the emergency department of Lariboisière (ERS + STHU), 26.28 FTEs work during the day and 21.84 FTEs at night; a total of 48.12 FTEs nursing assistants, i.e. a deficit of 38.88 FTEs nursing assistants for optimal functioning.
On the Bichat side, the non-medical workforce currently includes a total of 79 FTEs graduate nursing and 45 FTEs nursing assistants for the operation of the ERS and STHU. This corresponds to a deficit of 20 FTEs for graduate nurses and 42 FTEs for nursing assistants necessary for optimal emergency room functioning.

### Loss of attractiveness

One of the main reasons for the loss of attractiveness of our services is the arduousness. First, that caused by the typology of patients to be taken care of with a large social part in our two structures: for one located next to the Gare du Nord, and for the other near the Porte de la Chapelle. Then there is the one that results from a deficit mode of operation that means that the workload is automatically distributed among the caregivers who remain. Finally, there is the fatigue accumulated because of an activity that remains sustained over a long period.

Among other reasons to explain this loss of attractiveness, there is the lack of salary revaluation of caregivers. Indeed, the measures of the SEGUR de la Santé [31] have been insufficient to make up for the wage gaps with other European countries. Caregivers thus prefer to choose a mode of practice on temporary contracts or to join private emergency structures to be better paid.

### Closing beds

Recruitment difficulties in our hospitals have inexorably led to the closure of beds. Of course, it will be difficult for us to give a reliable estimate of this phenomenon. But many downstream structures are not able to receive patients due to a lack of staff. Services such as neurology or diabetology seem to be the most affected by this problem. This leads to an extension of the length of hospitalization of patients in the STHU while waiting for a place to become available. Or to promote outpatient care circuits in consultation when possible; for example, what our internal medicine services do.

### Strengths and limitations

Our study is descriptive and concerns the current practice during COVID-19 pandemic in 2 of the major university hospitals in Paris. It reflects the authors’ experience and sentiment on managing a major health care crisis.

One of its main limitations that we can formulate is the presentation of our activity according to different sources. It can be noted that depending on the sources chosen, the results may vary. The source “Urquel” reports an incident activity that does not consider the evolution of patients. And the “hygiene” source may be missing patients arriving at the emergency room with RT-PCR results performed in the city; and therefore, for whom RT-PCR has not been redone in the emergency room.

A second limitation of this study is the lack of archiving that has led us to lack weak data on nosocomial COVID cases, bed closures, or data on medical and non-medical staff one year after the pandemic, i.e. in 2021.

### Conclusion

During the 2nd and 3rd waves, we have taken up the same organizational strategy as in the past; namely the distinction between COVID and no-COVID zones. Unfortunately, the extraordinary human momentum we experienced disappeared in the following waves and shortage of staff became a major issue. Today, in many hospitals, care depends on a limited number of professionals who work in particularly difficult circumstances to keep emergencies open 24 hours a day. One perspective we can give to this work will be the presentation of the exceptional organizational strategy we use to address these challenges.

### Funding

No source of funding.

### Acknowledgements

E. Segol: Biostatistics and Medical Information Services, Hôpital Lariboisière, Hôpital Saint-Louis, Assistance publique des Hôpitaux de Paris, Paris, France.

N. Leclerc Du Sablon, MD: Biostatistics and Medical Information Services, Hôpital Lariboisière, Hôpital Saint-Louis, Assistance publique des Hôpitaux de Paris, Paris, France.

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Disclosure of interest

The authors declare that they have no competing interest.

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