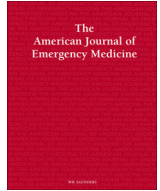




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## SARS-CoV-2 pandemic and emergency medicine: The worst is yet to come



To the editor

Emergency departments are available 24/7 to provide health care. Emergency medicine is a stressful work, with a time pressure that is an intrinsic characteristic of the job, focusing on breadth of acute care [1,2]. Furthermore, the lack of bed spaces, the increase of admissions without any increase of staff can induce burn-out symptoms for emergency physicians and their early departure for other specialties [3,4]. Since the end of 2019, a new Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) responsible to the CoronaVirus Disease (COVID-19) was discovered in the city of Wuhan, Hubei, China [5]. The local epidemic became fast a pandemic that forced worldwide government to declare global lockdown, quarantine and containment of more than 4 billion people [6]. People were required to stay at home for preventing the spread of the COVID-19 and the overflow of emergency and intensive care units. To face the wave of COVID-19, all activities were redirected towards the management of COVID-19 patients. Planned surgery and medical consultations were cancelled as much as

possible. All emergency departments and hospitals were prepared with dedicated COVID units [7], following specific procedures and international proposals [8,9]. But in some areas, the wave did not come. In the rural area of Puy-de-Dôme – 653,742 inhabitants with a density of 82 inhabitants/km<sup>2</sup> – only 326 patients had a positive test, with 29 deaths at the date of June 3rd, 2020. In the emergency department of Clermont-Ferrand – the main city of Puy-de-Dôme –, there were over 55,000 patients' admissions per year over the last five years, with 57,177 admissions in 2019 i.e. a mean of 157 admissions per day. The French containment was declared on March 17th, 2020. The number of admissions decreased drastically by 60% in one day, with around 60 admissions per day at the beginning of the lockdown. There was a mean of 88 admissions per day during the first month of the lockdown – i.e. nearly 50% of the usual number of admissions (Fig. 1). The drastic decrease is explained by the fear of patients to contract COVID-19 at the emergency department [10]. More interestingly, even patients with a putative life-and-death emergency did not come during the lockdown, with a decrease of transitory ischemic attacks by 32%, unstable angina by 64%, appendicitis by 42% and seizures by 36% [8]. Even if all-cause mortality data in the general population are not yet available (only deaths by COVID-19 are day-to-day reported), previous epidemics showed similar significant reduction in the utilization of health facilities

The collapse of the number of admissions  
at the emergency department during French containment

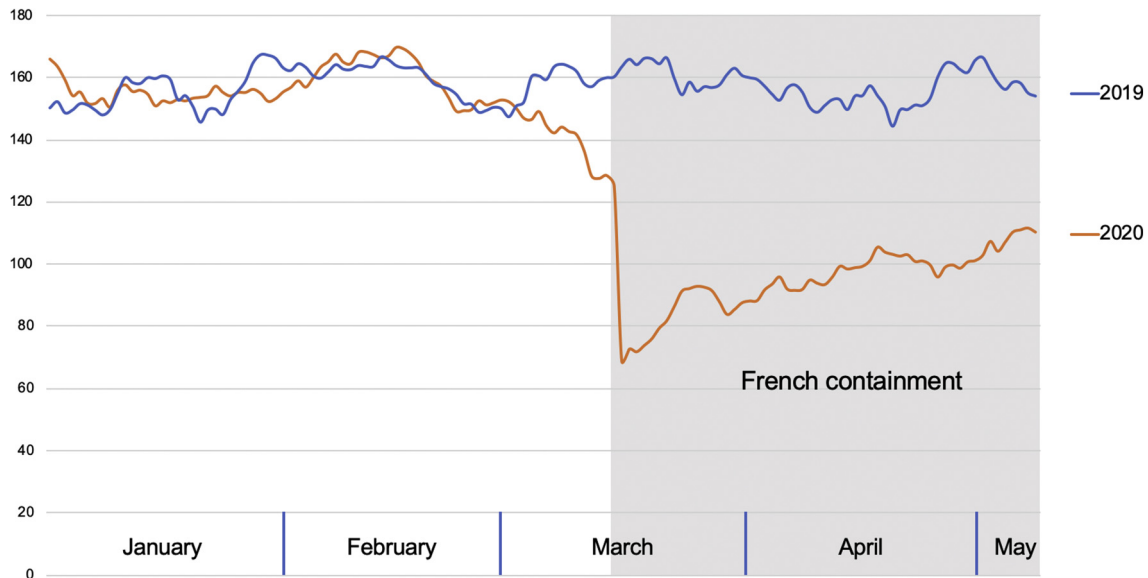


Fig. 1. The collapse of the number of admissions at the emergency department during French containment.

accompanied by a huge increase of all-cause mortality excluding infectious-related deaths [11]. Therefore, emergency staff are prepared to receive a massive increase of patients who did not seek care during the COVID-19 pandemic, because of their fear to get infected at the hospital. In addition to this unavoidable wave of non-related COVID-19 patients, several factors will increase the workload of emergency staff. All hospitals and emergency departments will have to keep the preventive measures to avoid a putative spreading of COVID-19 during an undetermined period. The ban of double room in favor of single hospitalized room will be prolonged, with the consequences of decreasing the number of bed spaces in the hospital, and thus increasing the workload for emergency physicians [12]. Moreover, the desire of medical doctors and surgeons to catchup the backlog will further saturate the beds available. Furthermore, the necessity of personal protection equipment (e.g. mask, gloves) for emergency staff is particularly time-consuming. There is also a possible summer heat-wave with well-known consequence on mortality – increase up to 3-times greater during episodes of long duration and high intensity [13] –, followed by a putative coexistence of flu and COVID-19 epidemic in fall. Lastly, we note the tiredness of staff [14,15] that did not have holidays over the last four months. Considering all of these points, the worse may well be yet to come for emergency departments. Second wave will not be a wave of COVID but a tsunami of patients who did not seek care.

### Declaration of Competing Interest

The authors of this work declare no conflict of interest.

### References

- [1] Schneider SM, Hamilton GC, Moyer P, Stapczynski JS. Definition of emergency medicine. *Acad Emerg Med*. Avr 1998;5(4):348–51.
- [2] Riggs LM. Emergency medicine: two points of view. A vigorous new specialty. *N Engl J Med*. 19 Févr 1981;304(8):480–3.
- [3] Dutheil F, Boudet G, Perrier C, Lac G, Ouchchane L, Chamoux A, et al. JOBSTRESS study: comparison of heart rate variability in emergency physicians working a 24-hour shift or a 14-hour night shift - a randomized trial. *Int J Cardiol*. 12 Juill 2012; 158(2):322–5.
- [4] Moukarzel A, Michelet P, Durand A-C, Sebbane M, Bourgeois S, Markarian T, et al. Burnout syndrome among emergency department staff: prevalence and associated factors. *Biomed Res Int*. 2019;2019:6462472.
- [5] Chan JF-W, Yuan S, Kok K-H, To KK-W, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet*. 2020;395(10223):514–23 (15).
- [6] Sandford A. Coronavirus: half of humanity on lockdown in 90 countries [Internet]. [cité 19 avr 2020]. Disponible sur: <https://www.euronews.com/2020/04/02/coronavirus-in-europe-spain-s-death-toll-hits-10-000-after-record-950-new-deaths-in-24-hou>; 2020.
- [7] Wennmann DO, Dlugos CP, Hofschröder A, Hennies M, Kühn J, Hafezi W, et al. Handling of COVID-19 in the emergency department: field report of the emergency ward of the University Hospital Münster. *Med Klin Intensivmed Notfmed*. 2020: 1–8. <https://doi.org/10.1007/s00063-020-00693-0>.
- [8] Feral-Pierrssens A-L, Claret P-G, Chouihed T. Collateral damage of the COVID-19 outbreak: expression of concern. *Eur J Emerg Med*. 2020. <https://doi.org/10.1097/MEJ.0000000000000717>.
- [9] Giamello JD, Abram S, Bernardi S, Lauria G. The emergency department in the COVID-19 era. Who are we missing? *Eur J Emerg Med*. 2020. <https://doi.org/10.1097/MEJ.0000000000000718>.
- [10] Masroor S. Collateral damage of COVID-19 pandemic: delayed medical care. *J Card Surg [Internet]*. [cité 2 juin 2020];n/a(n/a). Disponible sur: <https://onlinelibrary.wiley.com/doi/abs/10.1111/jocs.14638>.
- [11] Elston JWT, Moosa AJ, Moses F, Walker G, Dotta N, Waldman RJ, et al. Impact of the Ebola outbreak on health systems and population health in Sierra Leone. *J Public Health (Oxf)*. 2 Déc 2016;38(4):673–8.
- [12] Dutheil F, Boudet G, Perrier C, Lac G, Ouchchane L, Brousse G, et al. Use of heart rate variability to detect stressing professional events among emergency physicians. *Arch Mal Prof Environ*. Juin 2012;73(3):334–8.
- [13] D'ippoliti D, Michelozzi P, Marino C, de'Donato F, Menne B, Katsouyanni K, et al. The impact of heat waves on mortality in 9 European cities: results from the EuroHEAT project. *Environ Health*. 16 Juill 2010;9:37.
- [14] Depil Duval A, Haupais F. Napping in the emergency department at Evreux hospital in Normandy. *Rev Infirm*. Avr 2019;68(250):32–3.
- [15] Truchot J, Chauvin A, Hutin A, Leredu T, Plaisance P, Yordanov Y. Burnout and satisfaction among young emergency physicians. *Eur J Emerg Med*. 2018;25(6):445–6.

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